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OF THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE.

VOLUME XXIV.
TAI-WAN—TITLARKS.

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TAI-WAN (Tayvan) is the Chinese name of an island which in Europe is known by the name of Formosa, and Hersossa, and, according to the Dutchman Valentyn, is called by the aborigines Fokian or Pek-and. It lies between 21° 58' and 25° 15' N. lat., and between 120° and 122° E. long., and extends from south by west to north by east about 240 miles. In width it varies much. From its most southern point, where it is only about four miles wide, it increases gradually, so that at 22° N. lat. it is 60 miles wide, and at 24° N. lat. nearly 100 miles. Its northern portion decreases in width, but very slowly, for near its northern end it is still 60 miles wide. A rough calculation gives the surface an extent of about 14,000 square miles, which is about half the area of Ireland, and 3000 square miles more than that of Sicily.

The north-western point of Tai-wan is only about 80 miles from the coast of the Chinese province of Fukian, or Fokian; but farther south the channel of Fokian, as the sea between Tai-wan and China is called, grows wider. In the parallel of Amoy, 24° 40' N. lat., it is 150 miles across, and still wider south of that parallel. This part of the China Sea contains several banks, and the soundings are also extremely irregular, especially in the vicinity of the Poihoo or Phenghu Islands, called also Pescadores, or Fisher Islands. The southern extremity of Tai-wan is divided from the Bashi Islands, which are south-east of it, by the channel of Formosa, which is nearly 80 miles wide, and has also very irregular soundings.

The broad promontory which terminates the island on the south, and forms the south-east and south-west cape, is a low flat, but at the distance of about two miles the country suddenly rises into mountains, which continue to run in an unbroken chain northward nearly through the middle of the island to its northern extremity, terminating with high cliffs at the north-east cape. As it is certain that the range of mountains, which is called Ta Shan, or Great Mountain, is nearly the whole year round covered with snow, its elevation has been estimated by Humboldt at about 12,000 feet above the sea. The declivities of these mountains, with the exception of the crests of the most elevated portion, are covered with fine trees and pasture-grounds, and thus the island, when seen from the sea, presents a very pleasing appearance, whence it was called Hermossa by the Europeans who advanced thus far into the Indian Sea. These mountains have never been visited by Europeans, but from the accounts of the Chinese geographers, which have been collected by Klaproth, it appears that there is more than one volcano on this island. The Ta-hyang (Red Mountain), south of the town of Fung-chan-hian, was once an active volcano, and there is still a lake of hot water on Shin Mountains. The Phy-nan-my-shan, south-east of Fung-chan-hian, stood in the night-time a brilliant lustre. The Ho-shan (Pe-Mountain), south-east of Tshu-lo-hian, is said to contain many wells from which flames issue. There are some other mountains which exhibit traces of volcanic action, and sulphur constitutes an important article of export.

The mountains have a steep declivity on both sides, but on the west side they terminate at a considerable distance from the sea, so as to leave a wide tract between them and the shore. This tract has an undulating surface, and terminates on the sea in a low sandy beach. The adjoining sea is full of sand-banks and shoals, and can only be approached in a few places by vessels drawing more than eight feet of water. On the east of the Ta-shan range the mountains seem to occupy nearly the whole space between the crest of the range and the sea, and high rocks line the shore. There are no soundings along this coast. This circumstance, united to the strong current which sets along this side from south to north, is probably the reason why this part of Tai-wan has never been visited by European vessels; nor does it appear that Japanese or Chinese vessels have any intercourse with this part of the island. It is an unknown portion of the globe.

Rivers are numerous on the west side, but as they originate in a very elevated region, from which they descend in continuous rapids and cataracts, they bring down a considerable quantity of earthy matter, which they deposit at their mouths, forming bars, which have so little water as to admit only small vessels: this however seems to be no great disadvantage, as there are numerous islands along the shore, between which junks of ordinary size (about 200 tons burden) find good anchorage. Some of the rivers however are said to be navigable for a considerable distance inland, especially the Tan-shuy-kiang Bay, which lies in the narrow part of the channel of Fukian. The rivers also offer the great advantage of an abundant irrigation, though they are sometimes destructive to the crops by their inundations.

No portion of the ocean is subject to such violent gales as the sea surrounding Tai-wan on the west and east. Both monsoons, the north-eastern and the south-western, blow in the direction of the channel of Fukian, and as they are confined between two high mountain-ranges, the mountains of Fukian and of Tai-wan, their violence is much increased. At the change of the monsoons the most violent gales come on suddenly, and are accompanied by typhoons, whirlwinds, and waterstorms. Many Chinese vessels are annually lost at these seasons. The Japan Sea, which lies north of Tai-wan, is noted for its terrible tempests. In the vicinity of the island the north-eastern monsoon generally lasts nine months, as it commences to blow to the beginning of June. In other respects the climate of the island is very temperate, neither the heat nor the cold being excessive on the plains along the western coast. The island is subject to earthquakes, and they are sometimes very violent. In 1782 the whole lower portion was laid waste, and the sea inundated the country to the base of the mountains for several miles.
The soil of the lower tracts and the more gentle slopes of the mountains is very fertile, and produces abundance of rice, which is exported to the harbours of the island, which the Chinese are said to possess. It produces rice of excellent quality; also wheat, millet, maize, and several kinds of vegetables, among which are truffles. The sugar-cane is extensively cultivated, and the sugar made in the country, is said to be the best in the world. Other crops include camphor, pepper, aloes, and timber. Timber abounds in the large forests in the northern districts of the island. It is also stated that coffee, cotton, and silk are produced to a small amount.

Inhabitants are cattle, buffaloes, horses, asses, and goats, but sheep and hogs are rare. The horses are small, and the Chinese find them unfit for their cavalry. It is said that on the eastern unknown portion of the island there are many beasts of prey, as tigers, leopards, and wild hogs. The inhabitants are divided into twelve divisions, where wild hogs, deer, monkeys, pheasants, and game are very abundant. Salt is made to a great extent, and, together with sulphur, forms a large article of export.

The Chinese are not known to inhabit the island, and of aborigines. The Chinese are only found on the west side of the island, where they first settled a hundred and eighty years ago (1662). Their number many years ago was stated to be about 500,000 individuals. They are mostly from Fukian, and have preserved the customs of their original country, and the spirit of industry and enterprise by which their countrymen are distinguished. A considerable number of aborigines are settled among the Chinese, to whom they are subject, and are obliged to pay a tribute in corn and money. The collectors of the tribute are Chinese, who are required to know the language of the aborigines for the purpose of explaining to them the orders of the court. It is said that the oppression to which the aborigines are subject from these interpreters frequently causes them to rise in rebellion. These aborigines are of a slender make, and in complexion resemble the Malays, but they do not differ from the Chinese in features. Their language shows that they belong to the widely spread race of the Malay nations; and it is said that they are descendants of the Horasans of the Moluccas. Their religion resembles what is called Shamanism. The Dutch took some steps to convert them to Christianity, but their sway on the island was too limited and of too short a duration to produce any lasting effect. Nothing is known of the aborigines who inhabit the east side of the island. They are not subject to the Chinese, and are said to be continually at war with them. Inhabiting a country covered with lofty mountains, they are said to subsist mostly on the produce of the chase and by fishing.

The Chinese portion of Ta-wan is divided into four districts, which, from south to north, are Pung-shan-hian, Tai-wan-hian, Ta-hui-lo-hian, and Thang-hua-hian. The first is a comparatively large place, and has a garrison of 10,000 troops. The wall was built in 1725. The streets are straight, and intersect one another at right angles: they are full of shops, which are abundantly provided with all articles of Chinese industry. The largest building is that which was erected by the Dutch during their short stay in Tai-wan. There is still a small church built by the Dutch. It is stated that 1000 junks can anchor in the harbour; but as the single entrance, at spring-tides, being only 70 feet wide, it is impossible to accommodate them all. The entrance had a depth of water at low ten feet. Wuo-tao-kung, which was visited by Lindsay in 1832, has a harbour, which was then crowded with junks and numerous coasting vessels which brought the produce of the country, especially rice and sugar, to this place. Tan-shuy-kiang, at the embouchure of the river Tan-shuy-kh, is at the innermost recess of a fine bay, which is large enough for a numerous fleet, but has not been visited by the Europeans. This is near the northern extremity of the island, and is said to be the point at which the Dutch call it Quelou. It is capacious enough to contain 30 large vessels, and is the station of the Chinese navy at the island. An active commerce is carried on at this place.

The commerce of the island is limited to that with the eastern provinces of China, especially Fukian, to which it sends its agricultural produce, with sulphur and salt, from which it imports tea, raw silk, woolens and cotton goods, and other articles. The Chinese have erected some fortifications on them, as they have occasionally been taken possession of by pirates, who frequently infest the adjacent coast of China.

Opposite the southern extremity of the eastern coast of the island, is the entrance of the Celebes Sea. It is elevated, and about ten miles in circumference. It is surrounded by a sea without soundings, and no navigator has ever landed on it. It is said to be very populous.

Tai-wan is one of the principal islands known to the Chinese and Japanese at an early period, but they did not settle on it nor subject it to its sway. When the Dutch appeared in these seas, following the track of the Portuguese, they found no Chinese settlement either on the Ponghu Islands or on the coast of Zelandaia. The Dutch have erected some fortifications on the Ponghu Islands, and in 1634 they built the fortress of Zelandaia at the entrance of the harbour of Tai-wan-fu, where there was then a small town. They built also a small fortress at the harbour of Ky-long-shai. The town was fortified by the Dutch to protect the great number of families from Fukian who settled in the island, and the colony rose rapidly in importance. Meanwhile China was laid waste by the wars which terminated in the overthrow of the Ming dynasty and the establishment of the present family on the throne. The adherents of the former dynasty maintained their foothold longest in the eastern and southern provinces, Chekiang, Fukian, and Quangtung, but being pressed by their enemies, they abandoned Ta-wan, which was thus occupied by emigrants induced by the prosperity of the Ponghu Islands. In 1622 the Dutch lost the island, after having been in possession of it for twenty-eight years. Tai-tching-kung, the new king of Tai-wan, surrounded the settlement of his countrymen, the inhabitants of Fukian, and thus the island in a short time was converted into a Chinese colony. He was also favourable to the English, who had, during his reign, a commercial establishment on the island, from which they carried on an active commerce with Amoy.

The Dutch were the first Europeans who settled in the victorious Mantechoo longer than any other part of China, had been compelled to submit to their sway; and as Tai-tching-kung had died, and the throne of Tai-wan was occupied by a minor, the Dutch took possession of the Ponghu Islands. The Chinese were also preparing a descent on Tai-wan, when, in 1683, the council which governed in the name of the young prince thought it most prudent to surrender the island to the court of Peking.
priests, or rather monks, of Siam, and is supposed to be made from the fan which they always carry, usually of 
the Ava and Chau-cou; or Chau-ca, a kind of Silk from 
Talapoins (Journal of Embassy to Siam, p. 358), denominated 
by the Sanscrit word Talap. Tal is the common Indian 
name for the palm, and the older travellers give Ta-
lapoins as the name of the Chinese word for a fan. In the Pali (or learned 
tongue) the Tala is the name of a tree, or推测 value, a palm; but in the modern 
language of the country they are spoken of, as well as to, simply by the term Chau-cou, or 
Chau-ca, which signifies My lord (or literally Lord of me), the 
only form in which the palm is named among the 
other that employed to express extraordinary inferiority on 
the part of the speaker. (La Loubere, *Du Royaume de 
Siam, i. 407.) Mr. Crawfurd states that they are called 
Pha, which he says is a Pali word signifying Lord, ap-
plied also to Governors or Buddha; to the king, to the white 
elephant, to the idols of Buddha, &c. By the Burmese 
the Talapoins are said to be called Rahans, whence seems 
to come the name Raulins, given to them by the Moham-
dedans; as by the Chinese they are called Ho-chang; in 
Tibet, Lam-seng or Lamas; and in Japan, Bonzes. (Pre-
voy. Histoire Generale des Voyages, vi. 526; and Dr. Fr. 
Behanan, &c. *On the Religion and Literature of the Bur-
mese* in *Asiatic Researches*, vol. vi.) In Ceylon the 
name for the palm is generally known as Talapoins; but 
as the novices are said to be styled Sarnam Eoou Oonnn 
and certain inspectors, exercising a general superintend-
ence over the temples, Nakte Oonnnae and Mahanalke 
Oonnnae, it would seem that the name for priests of all 
kinds is generally derived from the Burmese, or rather 
name of the People of Ceylon, in *Asiatic Researches*, vol. 
vi.) Sarnam, or Somona, according to Dr. Buchanan, 
is a title given in Burmah both to the priests and to the images 
of Buddha, whence the Buddhists are often called Samo-
nae. It is derived, he says, from the Sanscrit word Saman, 
signifying gentleness or affability.

Ample information on the subject of the Talapoins is 
given by La Loubere, who visited Siam in 1687-8, in 
quarrel with the French envoy, in his work entitled 
*Du Royaume de Siam*, 2 vols. 12mo. London, 1691, 
vol. i. chaps. 17, 18, 19, 21, pp. 341-368 and 381-421; 
and by Mr. Crawfurd, in his *Journal of an Embassy from 
the Governor-General of India to the Courts of Siam and 
Cochin China*, (in 1621-22), 4to. London, 1829, pp. 350, 
&c. They are, as has been stated, a species of monks 
living in communities of from ten to some hundreds, and 
employing their time in devotion, religious study, and me-
ditations, and in begging, or rather receiving alms, for they 
are not permitted to labour with their own hands. The munici-
paries, in which each monk has his separate cell, are always 
adjointing to some temple; but it does not appear that the 
Talapoins officiate as priests or ministers of religion in our 
sense. Neither are they considered as forming 
or belonging to the clergy of theland, or of any 
specific study is looked upon as unseenly and pro-
parous to; and in fact they are mostly very 
ignorant. Yet the instruction of youth in the elements of 
learning appears to be chiefly or exclusively in their hands. 
Every Bayesian, we are told, becomes a Talapoin for some 
time. 'Every male in the kingdom,' says Mr. Crawfurd, 
'at some period or another of his life enter the priest-
hood, for however short a time. Even the king will be a 
priest for two or three days, going about for alms like the 
rest, and the highest officers of the government continue 
in the priesthood for some months.' Usually, it may be 
supposed, a man goes through the ceremony of getting 
ordained, not with any intention of permanently 
settling in the world; but he is expected to spend the 
accustomed community a second time, he cannot again withdraw 
from it. The Talapoins are said to be very numerous; but 
they seem to consist for the greater part of mere tempo-
rary, and of persons who have entered it for the second time in advanced life. Its ad-
vantages, or temptations, are, a life of idleness, exemption 
from taxation and from the conscription, security of sub-
stance and comfortable raiment, together with the cere-
monious reception and respect that are due to every 
man who has entered it. All the monasteries are endowed by the 
government, or by wealthy individuals, under whose protec-
tion they are considered to be. La Loubere has given a 
drawing of one; and another is described in Finlayson's 
account of the Mission to Siam and Bant in 1621-22, 
pp. 110. In their dresses of yellow cotton or silk, which 
are of the same fashion with those of the Buddhist priests 
or Brothers of the Talapoins of Siam present a highly 
 favourable contrast to the rags and squalidity of the gen-
eral population. On the other hand, a talapoin is not 
only separated from society by condemnation to celibacy, 
and is prohibited from possessing property, but is expected 
from the time of his ordination to conform in all things 
with the national religion which are very little attended to by any-
body else, especially the prohibitions against the slaying 
of animals (although they will eat them when slain), 
stealing, adultery, lying, and drinking wine. There are dif-
ferent orders of Talapoins, and there are also female Talapoins, whom he calls Talapouines; but 
these, according to Crawfurd, are only a few old women 
who are allowed to live in the unoccupied cells of some of 
the monasteries. The national head of the Talapoins, 
styled the Son-krat, is appointed to that dignity by the 
king, and always resides in the royal palace.

TALAVERA DE LA REyna, or La REAL, a 
large town of Spain, formerly in the province of Toledo, 
but now, since the late division of the Spanish territory, 
the capital of the province of its name. It is situated on 
the right bank of the Tagus, at the end of an extensive 
and well cultivated plain, 38° 52' N. lat., 6° 39' W. long. 
It is set in a rugged, rocky, and arid country, and derived, as the in-
scriptions and remains found in its territory shew, it had 
a fine Gothic church, the foundation of the celebrated 
Rodrigo Ximene, archbishop of Toledo, the author of 
a history of the Arabs and a Latin chronicle of Spain, about 
the middle of the thirteenth century. The town is 
badly built, and the streets are narrow and crooked. 
The population does not exceed 12,000, who are chiefly occu-
pied in the manufacture of pottery and hardware, for 
which Talavera is famous all over Spain. A large silk 
mill is also in the town, which belongs to the government, 
employs also many of the population. In July, 1809, Talavera 
was the scene of a battle between the British under Wellington 
then General Wellesley) and the French commanded by 
General Moreau; the battle was very short and bloody, but it ended in the complete defeat of the French. The 
exhausted condition of the English troops, who were 
without provisions, prevented them from following up 
their advantage and pursuing the enemy. There is an 
other town, in La Mancha, called Talavera la Vieja, or 'the old.'

TALC, a mineral which occurs crystallized and massive, 
and it is probable that some distinct species of minerals 
have been so called. Primary form of the crystal a rhom-
oidal lamina, sometimes in long prisms, the lamina 
being almost parallel to the face, and blackish-green and 
red. Becomes negatively electrical by friction; lustre pearly. Transparent; translucent; opaque. 
Specific gravity 2-715. 

Crystallized talc is mostly white, or of a light green 
colour; is met with in serpentine rocks in small quantity, 
with carbonate of lime, actinolite, steatite, and massive 
talc, &c. It is found in the mountains of Salzburg and the 
Tyrol. It occurs in many other parts of the world, as in 
Cornwall, in Kynyan's Cove, where a bed of it underlies 
serpentine. It also occurs in Scotland, in Glen Tilt, 
Perthshire; and in Saxony, Silesia, and Piedmont, &c. 

The massive varieties of talc are less flexible than the 
profiles; are crystallized into a fine-grained substance, and sometimes of a radiated structure. It is met with in 
considerable quantity in beds in micaceous schistus, gneiss, and serpentine. Some of the varieties of slate are insubible; others bear 
the name talc. It is generally white, and yield a small button of enamel with 
borax. 

Indurated talc is massive, of a greenish grey colour; the 
structure is schistose and curved; it is of a shining and 
sometimes of a pearly lustre, and somewhat translucent. 
It is soft and rather rauhous to the touch. Its specific 
gravity is 2'9. 

It occurs in primitive mountains in clay slate and ser-
pentine, in several countries on the continent of Europe; 
in Britain, in Perthshire and Banffshire in Scotland, and 
in the Shetland Islands.
Steleite, chlorite, and other magnesium minerals are nearly allied to micas, and they are by some mineralogists considered as varieties of the same substance.

**Talegalla.** Mr. G. R. Gray makes the *Megapodiinae* the third and last subfamily of his *Palamedeidae* (Palamoekia, Linn.).

The *Megapodiinae* comprise the following genera:—

Talegalla, Less. (Alectura, Lath.; Talegalla, Less.)

**Talegalla.**

*Generic Character.*—Bill very robust, very thick, one-third of the length of the head compressed above, with the upper mandible convex, lower; nostrils basal, lateral, oval-oblong, pierced in a large membrane; lower mandible less high but wider than the upper, nearly straight below, with smooth edges, the branches widened at the base, and that width filled up by a feathered membrane; cheeks entirely naked; head and neck furnished with feathers with simple barbules. Wings rounded, moderate, the first quill very short; the second rather longer, the third longest of all, the fourth and fifth diminishing in length after the third. Tail rather long, rounded; tarsi rather robust, moderately long, furnished with large scutella in front; toes rather long, the middle longest, the external shortest; the three front toes furnished at their origin with a membranous border, which is widest between the external and middle toes; claws convex, flattened below, slightly curved and moderately robust; the hind-toe long, resting entirely on the ground, and furnished with an equally robust claw. (Lesson.)

**Example, Talegalla Latham.**

Latham, in his *General History of Birds* (vol. i.), described and figured this bird under the name of the New Holland Vulture; but correcting his error, he, in the tenth volume, placed it among the Gallinaceous Birds, with the generic name of *Alectura,* which had been previously employed to designate a group of Flycatchers.

M.Lesson places the genus at the end of the Phasianidae.

**Talegalla.**

Mr. Swainson, in his *Classification of Birds* (vol. i., 1836), treating of the *Vulturidae,* notices this species, under the name of the New Holland Vulture, as being so like a raptorous bird, that some authors have hesitated (not having seen a specimen) as to what order it really belonged. 'So completely indeed,' says he, 'has nature disguised this rare and extraordinary vulture in the resemblance of the body, and which it is to represent in its own family, that it has even been classed by one writer with the *Me* 

**Head and feet of Talegalla.** (Gould.)

affinity are not entertained, such a classification has some plausible reasons to recommend it. In fact, the feet of the two birds are formed nearly on the same principle; but, then, so are those of Orthornyx, a little scurvy bird not much bigger than a robin. All three genera, in short, are similar in size for their length of feet, long and slightly curved claws, and the equality of length, or nearly so, of the outer and the middle toe. It is by instances such as these that we perceive the full extent of the relationship and, by founding our notions of classification from one set of characters, and forgetting to look at the full consequences of carrying those notions into extended operation. Nor is this the only peculiarity of the New Holland Vulture; for, unlike the members of its family, it possesses magnesian feathers in its tail. 'An examination of the bill,' Mr. Swainson gives a cut of it, which is decidedly raptorial, joined with many other considerations, shows that all these are but natural relations to the Talegalla, while the real affinities of the bird are in the circle of the *Vulturidae,* of which it forms the raptorial type. A perfect specimen of this very rare vulture, now before us (procured by Mr. Allan Cunningham in the forests adjoining Van Diemen's land), enables me to speak of much of Mr. Gould's examination.' In the synopsis to Mr. Swainson's second volume (1837), we find it in the family *Vulturidae,* under the name of *Cathartes* (which cannot be retained), between *Neophron* and *Gypaetus,* recorded as the raptorial type of the *Phasianidae.* And yet it is a no less a part of the same family. Latham, in his tenth volume, and Lesson, were right in considering it a raptorial species. Mr. Gould, to whom we are indebted for a full and satisfactory account of the habits of this extraordinary bird, to which we shall presently refer, is indebted to Mr. Sauer for his assistance. After all the facts that have been stated, I trust it will be evident that its natural situation is among the *Hapaeinae,* and that it forms one of a great family of birds peculiar to Australia, and that it is not a part of the tribe of the Indian vultures; that it forms a part; and in confirmation of this view I may add, that the sternum has the two deep emarginations so truly characteristic of the *Gallinacea,* at all events it is in no way allied to the *Vulturidae,* and is nearly as far removed from *Menura* as it seems to us to be from the remnants of the *Gallinacea* of Europe may be considered, in a degree, as the representative of the turkey in Australia.

**Description.**—Adult male: whole of the upper surface, wings, and tail, blackish-brown; the feathers of the under surface blackish-brown at the base, becoming silver-grey at the tip; skin of the head and neck deep pink-red, thinly sprinkled with short hair-like blackish-brown feathers; wattle bright yellow, tinged with red where it unites with the red of the eye; bill black; bill black, naked. *Female* about a fourth less than the male in size, but so closely the same in colour as to render a separate description unnecessary. She also possesses the wattle, but not so great an extent. (Gould.)

**Size about that of a turkey.**

Mr. Gould gives the following synonyms:—*New Holland Vulture,* Lath.; genus *Alectura,* ibid.; *Alectura Lathami,* J. E. Gray; New Holland Vulture, *Catharidae Australia,* Sw.; *Melorhina Linderi,* Jameson; *Brusoh Turquoise* of the colonists; *Weselah* of the aborigines of the Namoi.

**Habits, Nidification, &c.**—Mr. Gould describes *Talegalla Lathamii,* or the Watteled Talegalla, as a gregarious bird, generally moving about in small companies, much after the manner of *Galliniceps.* It seems to us to belong to that tribe, as very shy and distrustful. When it is disturbed, he states that it readily eludes pursuit by the facility with which it runs through the tangled brush. If hard pressed, or where rushed upon by their great enemy, the native dog, the whole company spring upon the lowestmost bough of some neighbouring tree, and, by a succession of leaps from branch to branch, ascend to the top, and either perch there or fly off to another part of the brush. They resort also to the shelter of bushes and trees in the middle of the day, a habit which Mr. Gould notices as generally tending to their destruction; for the sportsman is enabled to take a sure aim, and the birds, like the ruffed grouse of America, will give a succession of shots to be fired till they are all brought down.

But the most remarkable circumstance connected with the economy of this bird is its nidification, for it does not
of our zoological systems may be traced to the same source.

Leipoa. (Gould.)

Generic Character—Bill nearly as long as the head, slender, tumescent at the base, the edges undulated and incurved at the base, the nostrils ample, oblong, covered with an operculum, and placed in a central hollow. Head suberected. Wing ample, rounded, concave; fifth primary quill the longest; the tertiaries nearly as long as the primaries. Tail rounded, tail-feathers fourteen. Tarsi moderate, robust, covered with scuta anteriorly, and posteriorly with scales which are rounded and unequal. Toes rather short; lateral toes nearly equal. (Gould.)

Example, Leipoo o

Description.—Head and shoulders dark; from the chin to the late feathers, which the centre; back at three distinct bands near the tip of each lateral form, particulars primaries brown, the three zigzag lines n light buff, the tips of tail blackish-brown, feet blackish-brown.

In size this beaut thani, and it is more According to Mr. the nest; they were found some distance from each other, and buried in the earth. Captain Grey states that he is not sure of the number, but the account given by the natives led him to believe that at times large numbers were found.

Locality.—Western Australia. Mr. Moore saw a great many of them about sixty miles north of Perth; but its most favourite country appears to be the barren sandy

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Duperreui is given. It is there stated that it would seem

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Description.—Head and crest very deep cinnamon-brown; back of the neck and all the under surface very dark grey; back and wings cinnamon-brown; upper and under tail cover dark chestnut-brown; tail blackish-brown; irides generally dark brown, but in some specimens light reddish-brown; bill reddish-brown, with yellow.
This is the Oreegoonga of the aborigines of the Cobourg Peninsula; the Jungle-fowl of the colonists of Port Essington.

Habits, Food, Nidification, &c.—On Mr. Gilbert's arrival at Port Essington his attention was attracted to numerous great events in the lives of the natives; to the tumult of the aborigines. The natives, on the other hand, assured him that they were formed by the Jungle-fowl for the purpose of killing its eggs. But this last statement appeared so extravagant, and by the habits of birds, that no one in the settlement believed them, and the great size of the eggs brought in by them as the produce of this bird strengthened the doubt of the veracity of their information. Mr. Gilbert, however, knowing the habits of Lepros, took with him an intelligent native, and proceeded about the middle of November to Knocker's Bay, a part of Port Essington harbour comparatively but little known, and where he had been informed a nest of Jungle-fowl had been seen by some of the residents as being the tumuli of the aborigines. This they said was of the size of a common egg. It was a short bird about the size of a thrush. Mr. Gilbert side a thicket, and had not advanced far from the shore when he came to a mound of sand and shells, with a slight mixture of black soil, the base resting on a sandy beach, only a few feet above high-water mark: it was enveloped in a kind of thicket of those that had seen, so enveloped in thickly foliaged trees as to preclude the possibility of the sun's rays reaching any part of it) commenced at the outer edge of the mound and ran down obliquely towards the centre: their direction therefore, Mr. Gilbert observes, is not uniform. The mound, however thin the effect does not appear; some natives told Mr. Gilbert that the nestlings effected their escape unaided; but others said that the old birds at the proper time caught down and released them. The natives say that only a single pair of eggs were formed at a mound at a time. Our space will not permit a more detailed account of these highly curious mounds; but the reader should consult Mr. Gould's highly valuable work for other particulars we were wanting to the mound for Mr. Gilbert's description of the general habits of this interesting species.

The Jungle-fowl is almost exclusively confined to the dense thickets immediately adjacent to the sea-beach: it is not found, except in the hottest part of the summer, in the open country; but it is found in the open country; but it is found in the open country; but it is found in bunches of bushes, usually near the water's edge, or where the land rises gently to a sandy beach. It is always met with in pairs or quite solitary, and feeds on the ground, its food consisting of roots which its powerful claws enable it to scratch up with the utmost facility, and also of seeds, berries, and insects, particularly large species of caterpillars. It is also a very difficult bird to procure; for although the rustling noise produced by its stilt pinions when flying away is frequently heard, the bird itself is seldom to be seen. Its flights and five or six inches long in the extreme; when first disturbed it invariably flies to a tree, and on alighting stretches out its head and neck in a straight line with its body, remaining in this position as stationary and motionless as the branch upon which it is perched: if however it becomes alarmed it takes a horizontal but laborious flight for about a hundred yards with its legs hanging down as if broken. I did not myself detect any note or cry, but from the native's description and imitation of it I much resemble the skulking noise of a small bird, ending with a scream like that of the peacock. I observed that the birds continued to lay from the latter part of August to March, when I left that part of the country; and, according to the testimony of the natives, there is only an interval of about two months, the driest and hottest part of the year, between their seasons of incubation. The composition of the mound appears to influence the colouring of a thin epidermis with which the eggs are covered, and which readily chips off, showing the white inner shell of the egg, which is of a reddish-brown color. The eggs are always of a dark reddish-brown; while those from the sandy hillocks near the beach are of a dirty yellowish white: they differ a good deal in size, but in form they all assimilate, both ends being equal: they are from three inches and five lines long by two inches and three lines broad. (Birds of Australia.)

Mr. Gould has thus given the history of these three...
nearly allied genera, forming, as he observes, part of a great family of birds whose range will be found to extend from the Philippines through the islands of the Indian Archipelago to Australia. *Megapodius Tumorius* is, according to him, rather numerous spread over the whole of the Cabourg Peninsula on the north coast of the Australian continent, where the British settlement of Port Essington is now established; and he thinks that future research will require us to assign to it a much wider range, probably over the whole extent of the north coast.

*Megapodius Tumorius*, Mound-raising Megapode, with nest in the distance.

(From Gould.)

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Talent (τάλαντον) was the highest denomination of Greek weights and money, and was also commonly used by Greek writers as the translation of words signifying a certain weight in other languages. It is necessary to observe that the talent is properly only a denomination of weight. There was no coin of that name; and when used in reference to money, it meant originally a talent-weight of gold or silver, and afterwards a certain quantity of current money, the weight of which (supposing the real and nominal value of the coin to be the same) amounted to a talent.

I. The Hebrew Talent, or Kikkar (κικκάρ), contained 3000 shekels, and, according to Mr. Hussey's computation, its weight was 93 lbs. 12 ozs. avoirdupois, and its value as silver-money 396£ 3s. 10d. [Shekel.]. The Hebrews had no gold money of their own.

II. The Greek Talent.

The following were the principal denominations of weight and money among the Greeks:—δραχμή, δραχμικόν, ὑπάρχον, of which the δραχμή was the smallest. Their relative proportions are shown in the annexed table:—

<table>
<thead>
<tr>
<th>Obol</th>
<th>Drachma</th>
<th>Mina</th>
<th>Talent</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>100</td>
<td>200</td>
<td>3000</td>
</tr>
<tr>
<td>30,000</td>
<td>6000</td>
<td>1200</td>
<td>60</td>
</tr>
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</table>

This system prevailed throughout Greece, but the actual values of these variations may be included under two chief standards, namely, the Attic and the Aeginetan.

I. The Attic Talent.—The value of the Attic talent before the time of Solon is a matter on which we possess hardly any historical information, though we may perhaps arrive at a very probable result. Looking then at the system after Solon had remodelled the coinage [Solon], we find that the Attic silver money was celebrated for its purity; and therefore from the coins of that period which still exist we may determine the value of the standard with tolerable certainty. Now the chief coin was the drachma of silver, the average weight of which, from the time of Solon to that of Alexander the Great, is found to be 66·5 grains. From this we get the following values in avoirdupois weight:—

<table>
<thead>
<tr>
<th>Obol</th>
<th>Drachma</th>
<th>Mina</th>
<th>Talent</th>
</tr>
</thead>
<tbody>
<tr>
<td>11·08</td>
<td>66·5</td>
<td>83·75</td>
<td>100·32</td>
</tr>
</tbody>
</table>

This was the standard always used for silver money, and was therefore called 'the silver standard.'

Besides this there was another standard, the chief weight of which was called the commercial mina (εἴσηγορια), and contained 136 drachmae, according to the standard weight in the itinerarium Cyp. Inscript., i. 123, § 4); that is to say, that a commercial mina, contained 136 commercial drachmas, but that this was quite a different standard from that used for silver money. Thence we have nothing to express the latter in the ratio of 136:100; while the relative proportions of the weights were the same in both systems. The following table shows the value of the Attic commercial standard:—

<table>
<thead>
<tr>
<th>Obol</th>
<th>Drachma</th>
<th>Mina</th>
<th>Talent</th>
</tr>
</thead>
<tbody>
<tr>
<td>15·29</td>
<td>91·77</td>
<td>68·69</td>
<td>14·69</td>
</tr>
</tbody>
</table>

These weights were used for all commodities, except such as were expressly required by law to be sold by the silver standard.

This commercial standard is most probably, as Böck has shown, the real ancient Attic standard, as it existed before the time of Solon. The purpose of Solon's change was to lower the value of money, in order to relieve debtors. The only direct information we have of the nature of the change is the statement of Plutarch, that 'Solon made the mina of 100 drachmas, which had formerly contained 73, which is probably a mistake made by Plutarch, through not understanding the words of Androtion, whose authority he follows. The true meaning of the text would naturally to be, that out of silver which in the ancient standard made 73 drachmas, Solon coined 100, or a mina; that, that he lowered the standard in the ratio of 100:73. Now the ratio of the commercial to the silver standard is 136:100 = 100:72; 4.

Hence the commercial standard and the old Attic only differed by a small fraction.

Still this ratio of 100:73 is a very singular one for Solon to have adopted. The most probable explanation is that Solon meant to lower the standard by a quarter, that is in the ratio of 100:75, and that this new standard was to the Attic (compare Herod., iii. 89, with Pollux, ix. 6.; but it is also described with greater precision by Arian. (Var. Hist., i. 22), as having to the Attic the ratio of 72:70, which is the same as 75:72.' Now if we suppose the intended value of Solon's talent had for its real value the ratio of 75:72; we have this intended value equal (neglecting a very small fraction) to the Euboic talent. Hence that is inferred that Solon, propose to lower the Attic standard, and perceiving the advantage of assimilating it to that of the neighbouring island of Euboea, intended to adopt the latter for his new standard, but that in fact a slight difference was caused by accident.

The Romans reckoned both the Attic and Euboic talents as equal to 80 Roman pounds (compare Polyb. xx. 14, with xxii. 26, and Liv. xxxvii. 45, with xxxviii. 36). The Attic commercial standard underwent an alteration by the edict above referred to, which made its mina = 150 drachmae (silver) its silver mina (commercial) = 6 minae (commercial) its talent = 65 minae (commercial)

In this new standard the five-minae weight was equal 1 71·34 ozs. 14·96 grs., and the talent to 85 lbs. 24 ozs. 70 grs.

The Athenians took the greatest care of their standard of weight. The principal set were lodged in the Aegina, and there were other sets in the Prytaneum, at Piraeus, and at Eleusis.

The heaviest coin used by the Athenians was the tetra drachm, or piece of four drachmas; the mina and talent were never coined, but were paid in drachmas, obols, &c. The following table shows the value of all the denominations of Attic silver money, according to the computation of Mr. Hussey:—

<table>
<thead>
<tr>
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<th>Talent</th>
</tr>
</thead>
<tbody>
<tr>
<td>11·08</td>
<td>66·5</td>
<td>83·75</td>
<td>100·32</td>
</tr>
</tbody>
</table>
2. The Aeginetan talent. It is a disputed question what was the ratio of the Aeginetan to the Attic talent. Pollux (ix. 70, 88) says that the Aeginetan talent contained 10,000 Attic drachmae, and the Aeginetan drachma 10 Attic obols, which would give the ratio of 5:3 for that of the Aeginetan to the Attic talent. According to this statement, the Aeginetan drachma weighed 110 grains English. Now the existing coins give an average of only 96 grains and the question is whether we are to follow Pollux or the coins. Mr. Hussey takes the latter course, explaining the statement of Pollux as referring to the debased drachma of later times, which was about equal to the Roman denarius. Böckh adheres to the statement of Pollux, explaining the lightness of the Attic coins by the well-known tendency of the ancient mints to depart from the full value. He has supported his view by some very strong and ingenious arguments, and on the whole he appears to be right.

There were other talents used by the Greeks and Romans, most of which seem to have been derived from one of these two standards, but the accounts of ancient writers respecting them are very contradictory. Their values are discussed by Boeckh and Hussey.

The most important variations of the Aeginetan standard were those used in Macedonia, Corinth, and Sicily.

The above talents were all reckoned in silver money. There was also a talent of gold, which was much smaller. It was called the Trojan talent, in a broad sense of Italy and Sicily, and in a narrow sense the Sicilian talent, which was called the Sicilian talent as well as the gold talent. It was equal to 6 Attic drachmae, that is, about 2 ½ oz. and 71 grs. It was divided into the Italian Greeks into 34 semis, and afterwards into 12, each nummus containing 2/15 litre. When a person uses the word talent, we are always to understand by it this small one of gold. In other classical writers the word generally means the Attic talent.

Böckh, Metricol, Unterricht; Hussey, Ancient Measurement; Dictionary of Greek and Roman Antiquities, 1842.)

TALES. At common law, when the number of jurors in attendance was so small, or so much diminished by challenges that a full jury could not but have a writ (for want of a proper arm of the court) it was called a vomit of the parties, where the sheriff, himself, or his deputy, summoned (such) tales (other) fit persons, &c. for the purpose of making up the jury. The jurors so procured were called talesmen, from the Latin word used in the writ. By the statute 2 Hen. III., c. 6, the defects of jurors might, at the request of the plaintiff or defendant in an action, be supplied from such other able persons of the said county then present, and these were ordinarily called, from the words in the Latin writ, tales de consortium. Subsequent statutes extended and regulated the application of this statute. But the act now in force is 6 Geo. IV., c. 50; the 37th section, which contains the existing law on the subject, is in the following words:—Where a full jury shall not appear before any court of assize or nisi prius, or before any of the superior civil courts of the three counties palatine, or before any court of great sessions, or, after appearance of a full jury, by challenge of any of the parties, the jury is likely to remain untaken for defects of jurors, every such court, upon request made for the king's service, and thereto authorized and empowered by the court, or on request made by the parties, plaintiff or defendant, demandant or tenant, or their respective attorneys, in any action or suit, whether popular or private, shall command such a jury to be sworn. This number of the return shall belong, to name and appoint, as often as shall require, so many of such other able men of the county then present as shall make up a full jury; and the sheriff or other minister aforesaid shall, at such command of the court, return such men duly qualified as shall be present, or can be found to serve on such jury, and shall add and annex their names to the former panel, provided that where a special jury shall have been struck for the trial of any issue the taleman shall have empanelled upon the common jury panel to serve at the same court, if a sufficient number of such men can be found; and the king, by any one so authorized or assigned as aforesaid, and all and every the parties aforesaid, and may, in each of the cases aforesaid, have their respective challenges to the jurors so added and annexed, and the court shall proceed to the trial of every such issue with those jurors who were before empanelled, together with the talemen so newly added and annexed, and the said jurors had been returned upon the writ of precept awarded to try the issue. (2 Williams's Saunders, 349 n. (1.))

TALCIOTTUS, GASPAR, TAGLIACOZZI, or TAGLIACOZZI, was professor of anatomy and surgery at Bologna, where he died in 1553, at the age of 64 years. His name is now known chiefly through his reputation for restoring lost noses; but during his life he was equally celebrated for his knowledge and character as a lecturer. These last are indeed the only qualifications for which he is praised in a tablet put up after his death in one of the halls of the school at Bologna. A statue erected in the amphitheatre formerly recorded his skill in operating by representing him with a new nose.

Some writers have spoken of the original Talciacottian operation as a mere fable, pretending that it never could have been followed by success. But several credible witnesses have either seen Talciacott operating, or saw patients to whom he had restored noses, which very closely resembled those of natural formation. The truth is that the operation which Talciacottus really performed is not commonly known; the generally-entered notion of the operation has been derived from the account of those who had some reason to misrepresent it. It will therefore be worth while to give a somewhat detailed account of it.

The work in which it is described was first published forty-four years after Talciacottus's death, with the title De curorum chirurgia. It was printed at Venice in 1557, folio. It is divided into two parts, of which the first is chiefly devoted to a disquisition upon the dignity of the nose, lips, and ears, and upon their offices and general construction, and the second to actual descriptions, which it considers to be exactly analogous to that of grafting upon trees. In the second book he describes the mode of operating, dwelling first at great length upon the necessary number and character of the saws to be used, its position with regard to light, &c., and several other minor matters, on all which he speaks with such tolerably well-experienced in surgery. In the operation itself he used the following plan:—A part of the skin of the parotid gland and bone is removed in a lengthwise parallel lines, being marked out over the middle of its fore part, was seized between the blades of a very broad pair of nippers. Each blade was about three inches broad, so that it might include the whole length of the portion of skin to be removed, and had a long slit near its edge through which a narrow knife could be passed. The portion of skin of which the new nose was to be formed was raised up by the assistant who held it in the nippers, Talciacottus with a long spear-shaped knife transfixed it through the slits in the blades of the nippers, and cut it through the whole length of the latter from above downwards. Through the aperture thus made, which might be compared to a very broad incision for a seton, a band covered with appropriate medicines was passed, and the skin being drawn a little every day, the wound was kept open like a seton wound. When all the inflammation had passed away, which was usually in about fourteen days, the flap of skin was thrown up at the upper end, and thus the piece bounded by these two sets of wounds, raised from the arm, and remained attached to it by nothing but its fourth side or lower end. In this state it was allowed to cicatrize all over, till it acquired the character of a loose process, and then being thus completed, and the piece of skin having become firm and hard, it was deemed ready for engratting. The head therefore being cleanly shaved, a dress and bandage of singular construction, intended for the maintenance of the arm in its due position, were carefully fitted on. Then
TALIPAT or TALIOT PALM. [CORYPHÆA.]

TALISH. [GEORGIA.]

TALISMA'N an Arabic word, supposed to be derived from the Greek τελέμα, τισεμα (τισεμα), is a figure cast in metal or copper, and of the same kind and degree as the injury. This punishment was a part of the Mosaic Law: 'breach for breach, eye for eye, tooth for tooth: as he hath caused a blemish in a man, so shall it be done to him again' (Leviticus xxiv. 20). The name 'talioc' occurs in the sura or the Thirty-Sixth, in his meaning is not there defined what it means, but the signification of the term may be collected from other places. The word contains the same element as the word talia, 'such,' or 'this.'
true, even when the public shall have been put in possession of the contents of these papers, it will only have acquired another statement in addition to those previously in its possession, by the comparison of which it must have gone forward. At present however, while these memoirs continue a sealed book, and scarcely any of M. de Talleyrand's intimate friends have yet contributed their fragments of information, no resource is left to the biographer but by collating his writings, his ostensible share in the events of the time, his own known character, and the light thrown upon him by his voluminous correspondence, not only of his correspondence with himself or his acquaintances to estimate as near as he can what probable foundation in reality there is for the accounts of M. de Talleyrand, which have been compiled from what may be called public grounds. Talleyrand-Perigord was born on the 13th of February, 1754, the eldest of three brothers. His family was ancient and distinguished; but he was neglected by his parents, and placed at nurse in one of the cafards of Paris. ... a year old rendered him famed for life, and being on this account unfit for the military career, he was obliged to renounce his birthright in favour of his second brother, and enter the church. The contempt and aver- sedness for him amongst his relations was so universal, that he expressed a gloomy and taciturn character on the boy. From the charge of his nurse he was transferred to the Collège d'Harcourt, and thence successively to the seminary of St. Sulpice and to the Sorbonne. In all these schools, he was of no note to his superiors; but by his own exertions he became a clever, bookish lad. He showed in after-life a taste for literature, and such an extensive acquaintance with and appreciation of science as itself gratifying to the statesman; and the taste and knowledge must have been acquired at an early period of his life. ... threw him into the company of society equal in rank for the first time at the festivities with which the coronation of Louis XVI. was celebrated (1774), under the title of the Abbé de Périgord. His appearance at that time was striking. His ambitious, energetic and refined mien rendered the clerical profession an object of detestation to him, but he could not escape from it. He availed himself to the full extent of the indulgence with which his age and country regarded the irregularities of the young and noble among his pupils, but the proud and haughty character, with which twenty years of undeserved neglect had inspired his confident and strong character served him in part as a moral check. He was a strict observer of the appearances exacted by the conventional morality of society; and his virility, which was covered over with some of the dross of a whole future career. Thrown back upon himself from the beginning, he had necessarily become an egotist; vigorous both in mind and body, he had a healthy relish of pleasure, and he engaged with eagerness in the pursuits of pleasure, but the enjoyments of which the sedentary state of a public servant was inconsistent for one of his intellectual character and fastidious tastes.

In 1778 Voltaire visited Paris. M. de Talleyrand was introduced to him, and the young author reviewed him with left such a deep impression that he was accustomed to talk of him with a lively pleasure till the close of his life. Voltaire and Fontenelle were M. de Talleyrand's favourite authors; upon whom he formed his written and still more his unexpressed, and of which he was constantly in demand at Paris when he entered the world, and both his love of pleasure and his love of power prompted him to cultivate that which he possessed. That he did so with eminent success the concurrent views of the best judges of his character are themselves an evidence in the case; it is impossible to convey an adequate impression of it to posterity. The reporters of flashes of wit and brilliant turns of conversation uniformly communicate to those something of their own inferiority, and vulgarise them in the telling. Again, superior excellence in conjunction is an art; the artist is and ought to be judged by his materials, but by the success with which he uses them. Written bon mots are necessarily estimated by the quantity and quality of thought expressed in them: they are judged as we judge the writings of a poet: whereas the person who introduces them with effect in conversation ought to be judged as we judge the actor, of whom we do not think less because he merely says what the poet has put into his mouth.

The robust and healthy Epicurean who requires the stimulus of intellectual excitement is almost inevitably driven to seek the former in the pursuits of ambition. M. de Talleyrand was no exception to the general rule. And the Abbé de Périgord must have displayed, even when he was apparently, when perhaps he was not, what is called an original genius, that which inspired a belief in his business capacity; for in 1780, while yet only in his twenty-sixth year, he was appointed general agent of the clergy of France. He discharged the duties of this important office for eight or ten years. This was an independent in its relations to the Papal chair of any church that remained in communion with Rome. It was also a powerful church viewed in its relations to the state, of which it was an element. Its revenue derived from landed property was large, that derived from other sources perhaps still larger: it had regular assemblies in which it legislated for itself, determined what contributions it ought to pay to the state, and in what proportions its funds were appropriated. He was, therefore, in cultivating experimentally a talent for administration. Nor was this all: the dignified clergy of France took an active part in secular politics. There is a passage in the éloge of M. de Richepin already alluded to, which seems rather the echo of the famous lines of Dryden, than the natural sentiments of an Epicurean in this period of his life:—I will hazard the assertion that his (M. de Richepin's) first studies had been an excellent preparation for the diplomatic career. The study of theology in particular had endowed him with a power, and at the same time the peculiarPosture of the French nation, which characterise all the documents which have proceeded from his pen. To guard myself against the charge of indulging in paradox, I must here enumerate the names of some of the distinguished theologians, all theogelians, and all distinguished in history for the success with which they conducted the most important political transactions of their times. And he follows up the remark with a very respectable list. The general agent of the clergy was their minister of state, and M. de Talleyrand, while he continued to fill the office, was a powerful subject, and occupied a conspicuous place in the eye of the public. In 1788 he was appointed bishop of Autun. The commencement of his political career, in the strict acceptance of the term, was in 1790. An article upon M. de Talleyrand in an early number of the "Edinburgh Review"—the materials for which were furnished by Dumont,—asserts that he owed his advancement to the see of Autun to a "Discours sur les ressources de l'Église," which was read for the clergy of France, in the Assembly of Notables which met at Versailles, in February, 1787. As bishop of Autun he was a member of the États Généraux convoked in May, 1789, which was the organization of a system of local government. The interval from the meeting of the Notables till the dissolution of the Assembly is an important one in any attempt to solve the problem of M. de Talleyrand's real character. Previously to the meeting of the States-General, M. de Talleyrand indicated the course he intended to pursue, in a discourse which he addressed to the assembled clergy of his diocese; and in which he advocated the equality of all citizens in the eye of the law, and free discussion. When discussing the subject of the clergy, he had enabled the Assembly to proceed to business, the precise directions given by many of the bailiages to their deputies were found an impediment in the way of practical legislation: M. de Talleyrand moved that they should be disfranchised by the Assembly, and of which the second was, the organization of a system of local government, in the financial discussions which took place in the committee and Assembly, M. de Talleyrand retained
his dislike of lotteries. He supported all or most of the various loans proposed by Necker; and seconded Mir- beau's exhortations to keep faith with the national creditor. He suggested practical measures with a view to this end, and among other things, the act that he had proposed and supported the abolition of tithes, reserving however a competent provision for the priesthood, and even improving the condition of the poorer clergy. He also proposed to establish a 'caisse d'amortissement,' as an act of the whole Church, to the advantage of the state, to retain an adequate provision for the clergy—hence his anxiety to identify the clergy with the nation. His anxiety to establish a constitution modelled upon that of England was always avowed. His views the views he expressed, in the debate of July 1791, on the question regarding territorial divisions and the organization of local government, finance, and education, though overborne for a time in the storm of the Revolution, have revived and been adopted by the Empire, the Restoration, and the present dynasty. The recklessness as to the means by which he attained his ends which he displayed even at this period of his career is no evidence of insincerity, but merely of the want of faith in men, which the treatment he had experienced in early life, and his observation of the society to which he habitually mixed in, had instilled into him. It was his weakness through life to pride himself in the display of his power of refined mockery, regardless of the enemies it created; he gave vent to his spirit of raillery in an action of a character that was invariable, and the notions and colouring to his corps d'état, which rendered them more startling than if they had been as prosaic as those of other men. The world is perhaps less startled with the acro- city of passion in a statesman, than with a laughing air which is impossible to a man who has been expelled by the devices his solemn inauguration of the constitutional monarchy by the religious celebration of the 14th of July. But the love of theatrical presentation and the delusive belief that good may be effected by it is an idea very foreign to his character. Talleyrand in all likelihood looked forward at that moment to being the founder and future primate of a church which should be to France what the Anglo-Episcopal has been to England. The means to the end he was driven to employ was only to carry through the installation of the national bishops, undervelved him, and brought back his early disgust for the profession with redoubled force. He not long after resigned his bishopric of Autun, and at the same time renounced his ecclesiastical chair ever.

The history of M. de Talleyrand from the dissolution of the Constituent Assembly, in September, 1791, till the overthrow of the monarchy, on the 10th of August, 1792, would be instructive were it merely a demonstration of his folly, his obstinacy, his career, and the way in which his body terminated its career. Its members were declared ineligible to the next assembly, and also incapable of receiving any appointment from the crown until two years elapsed from the date of its dissolution. The conse-quence was, that M. de Talleyrand among others was con- sidered incapable of any legislative or ministerial office. It was at that time an object with all who desired that the Revolution should have fair play, to preserve peace with England, which, although still ostensibly neutral, was every day presenting additional symptoms of alienation. The court party hated M. de Talleyrand for having taken part frankly with the Revolution; the republicans hated him for his advocacy of a limited monarchy; all parties were disgusted with the equivocation of his character: parties agreed that he was the only man whose talents fitted him for the delicate mission to England. And it was impossible to appoint him to it. He was dispatched however, in January, 1792, without any ostensible diploma to advance the interests of the government, to round the Emperor, and to commence negotiations. His want of an official charac-tor allowed the queen to indulge her feelings of personal dislike to the ex-bishop of Autun by turning her back upon him in a sort of well government, thus expelling him and rendered him powerless. After the accession of the Gironde to office, the attempt to at least neutrality on the part of England was renewed: Chauvelin was sent to England, and Talleyrand was recalled to Paris as a real ambassador. By this time however the French govern-ment had become as obnoxious to the general public of England as to the court circles: the torrent was probably
to have been stemmed by Talleyrand, even though he had been in a condition to act directly and in person. He could do nothing, forced as he was to act by the instrumentality of a man too jealous and optimista to consent honestly to the direction of one whose authority necessarily made him feel himself a mere puppet. Talleyrand’s good faith at this period in labours to preserve peace between England and France, as the only means of rendering a constitutional monarchy possible in France, was good enough to make his employers quite certain that he had pursued his object, undaunted by the most gross personal results, as satisfactorily established by the narrative of Dumas.

Talleyrand was at Paris when the events of the 10th of August put an end to the monarchy; and it required all his dexterity to enable him to obtain passports from Danes, to enable him to quit Paris. He fled to England, and having saved little of his property, he was obliged to sell his library there to procure himself the means of support. The English government, jealous of his presence, after some time ordered him to leave the country in twenty-four hours; and prosecuted in France, he was obliged, with a dispirited fortune, to seek refuge in Amsterdam. Madame de Staël has claimed, and apparently with a good title, the credit of instigating Chénier to demand the recall of M. de Talleyrand after the fall of Robespierre and the termination of the reign of terror. The National Intéress had in his absence been appointed a member of the class of moral and political science. At the first sitting of this society which he attended he was elected secretary, an office which he retained officiously till government seduced him to read two papers afterwards published in the Mémoires de la Classe des Sciences Morales et Politiques de l’Institut National, which are justly considered not only as the most able and original of his published writings, but as those which were most immediately his own. The first of these is entitled:‘Essai sur les Avantages à retirer de Colonies Nouvelles dans les Circumstances présentes;’ the second, ‘Mémoires sur les relations Commerciales des Etats-Unis avec l’Angleterre.’ The latter, is properly speaking, a supplement to a pamphlet which denounces a piece of despotism directed against the Swiss, and is addressed to the Swiss. The great object of both is to point out the importance of colonies to a country like France, in which the revolutionary fervour, though beginning to burn, was still insufficient to maintain the reign of custom and suffering, unless measures were adopted to neutralize it. There can be no mistake as to the views being those of M. de Talleyrand himself. They are such as could only occur to a person entertaining the political opinions he approved; you must not indeed expect them to be so, nor can you expect them to be so. As a Frenchman he deprecated the departure of the French from colonies; as a man he approved it, and the men who had been exiled by the reign of terror which decimated his countrymen, was living in a country where a successful revolution had quietly and speedily subsisted into a settled form of government; in a country where he felt that as an Englishman becomes at once a native, and a Frenchman remains for ever a foreigner. Not satisfied with pointing out in what manner colonies might be rendered powerful assistants in tranquillizing France, the essayist entered deeply into the principles of colonization, explaining the advantages to be derived from colonies, and the law by which their economical advantages might be perpetuated even after their political relations with the mother-country had ceased. In his treatment of this subject he evinces a clear understanding with pleasure and with clearness, as to France and America, and just and extensive views in political economy.

It was not however so much the political talent displayed in these essays, as M. de Talleyrand’s skill in employing the influence of his influence, Buralles, that obtained for him the appointment of foreign minister under the Directory. Here again he was indebted to Madame de Staël, who assisted him through her influence with Burras. M. de Talleyrand accepted the offer of a position which required a perfect knowledge of its character and its weakness. His conviction that a Frenchman could never be at home in America prompted him to grasp at the first opportunity of returning to his native country: his state of mind was, men with a talent for employment necessary for him; and political business was the only lucrative employment for which he was qualified.

There is nothing in his life to contradict the belief that he again engaged in politics with a desire to promote what was right and useful as far as he could; but he engaged in them aware that he might be ordered to do what he disapproved of, and prepared to do it, under the plea that it was necessary, and that the responsibility rested upon his employers. His position under the Directory was consequently an equivocal one. He was engaged, so long as he occupied it, in intrigues which had for their aim the maintenance of himself in office, even if it was to do the Directory’s work. The part which he took in the attempt to extort money, as a private gratification, from the American envos who arrived in Paris in October, 1807, was probably forced upon him by the directors: had it been his own wish, he would have been more circumspect, with more judgment, and the Americans would not have been driven to extremes, for he understood their national character. But allowing himself to be used in such a shabby business betrays a want of self-respect, a want of security of sentiment, or both. He had his reward for this, when public indignation was excited by the statements of the American envoys, the minister of foreign affairs was sacrificed to the popular resentment.

Having adopted a mission in which success could only be expected under a settled government, believing a monarchical government to be the only one which could give tranquillity to his country, and anxious to assist with money and men to run up a make-shift government out of the best material he could find, he had devoted himself to the growing power of Bonaparte. When the future emperor returned from Egypt, M. de Talleyrand had been six months in a private station; though, had he wished it, he might have taken part with efficiency to the first consul to conspire against the Directory. Bourrienne is not the best of authorities, but the earlier volumes of the memoirs which pass under his name are less falsified than the latter; and an anecdote which he relates of Talleyrand’s first interview, at the first consul, after being reappointed minister of foreign affairs, is so characteristic, that its truth is highly probable:—M. de Talleyrand, appointed successor to M. de Reinhardt at the same time that Cambacérès and Lebrun succeeded Sicyles and Roger Duques as his rivals, was admitted at my instance, at my instance, to the first consul. The speech which he addressed to Bonaparte was so gratifying to the person to whom it was addressed, and appeared so striking to myself, that the words have remained in my memory:—’Citizen Consul, you have confided to me the department of foreign affairs, and I will justify your confidence; but I must work under no one but yourself. This is not mere arrogance on my part: in order that France be well governed, unity of action is necessary; this is a master: this is the master I wish to be, and the master I hold in my hand all the main-springs of the political machine—the ministries of the interior, of internal police, of foreign affairs, of war, and the marine. The ministers of these departments must transact business with you alone. The ministers of justice and finance have, without doubt, a powerful influence upon politics; but it is more indirect. The second consul is an able jurist, and the third a master of finance: leave these departments to them; it will amuse them; and you, general, having the entire management of the essential parts of government, may pursue without interruption your noble object, the regeneration of France.’ These words accorded too closely with the sentiments of Bonaparte to be heard by him otherwise than as advice. He afterwards told me that the Talleyrand had taken his leave, ‘Do you know, Bourrienne, Talleyrand’s advice is sound. He is a man of sense.’ He then added smilingly:—’Talleyrand is a dexterous fellow: he has seen through me. You know what I wish to do at the present moment; you know what I want to see done; you know that the first consul is a good man, but a mere book-maker; Cambacérès is too much identified with the Revolution: my government must be something entirely new. It was an armoured man. The Talleyrand may be said to have understood each other, and that in a sense not discreditable to either. The good sense of both was revolled by the bloodshed and theatrical sentiment, the bended fecundity and coxcombry of the Revolution; both were practical statesmen, men with a talent for employment necessary for him; and the most constitution-makers. Like most men of action, neither of them could discern to the full extent the advantage an executive government can derive from having the line of
action to a considerable extent prescribed by a constitution; but Talleyrand saw better than Napoleon that the laws which protect subjects by limiting the arbitrary will of the ruler, in turn protect him by teaching them legitimate means of defending their own rights and their lives. They resembled each other—not being remarkably scrupulous as to the means by which he attained his ends; though this laxity of moral sentiment was kept in check by the natural humanity of both. Their very points of difference might serve to cement their friendship. The observant self-centred mind of Talleyrand was lamed by its want of power to set others in motion: it is only through sympathy that the contagious love of action can be conveyed. The impassioned and imaginative soul of Talleyrand was made to act upon him and whet him along with him; and this power was often too strong for itself: Napoleon, though capable of reflection, was too often hurried away by his instinctive impulses. Each of these men felt that the other was a supplement to himself. Talleyrand rebelled, admired and appreciated Napoleon. If he flattered him, it was the delicate method of confirming him in the opinions and intentions which met his approbation. He dared to tell the First Consul truths which others were afraid to tell the emperor. He was authorized to arrest the minister of Napoleon, by postponing the fulfilment of his orders until he had time to cool. He opposed, as long as there was any prospect of success, the divorce from Josephine; but his virtue gave way in the face of the difficulties to which we exculpate him from participation in the execution of that prince, to gratify his master he sanctioned the violation of a neutral territory. This was however the only instance, in so far as Bonaparte himself was concerned, of the Divorce which caused him to flatter that can be brought home to him. Napoleon's frequent recurrence, in his conversations at St. Helena, to the subject of Talleyrand's defection, his attempts to solve the question at what time that minister 'began to betray his country', show his appreciation of the services he had received from him.

For a time their alliance continued harmonious, and that was the time of Napoleon's success. The arrangement of the Concordat with the pope was the basis of the future empire. Napoleon was created Duke of Berry by the treaty of Luneville, secularising the ecclesiastical principalities of Germany; the treaty of Amiens, recognising on the part of England the conquests of France, and the new form given to the Continental states by the convention of Elsinore, which gave them to the Czaspuline republic; all bear the impress of the peculiar views of M. de Talleyrand. And the minister of foreign affairs was fully aware of his own consequence. In 1801, when a crisis of the imperial government was produced by the defection of Bourbon L'Archevech, he wrote to Napoleon:—'I regret being at a distance from you, for my devotion to your great plans contributes to their accomplishment.' After the battle of Ulm, Talleyrand addressed to the emperor an attempt to impose on him the necessity of the preponderance of France, by uniting Tyrol to the Helvetic republic, and erecting the Venetian territory into an independent republic interposed between the kingdom of Italy and the Austrian territories. He proposed to reconquer Austria by this arrangement by concluding with the whole of Wallachia, Moldavia, Bessarabia, and the northern part of Bulgaria. The advantages he anticipated from this arrangement were that of removing Austria from the sphere of French influence, and of extinguishing it, and that of raising in the East a power, better able than Turkey to hold a balance with Russia. Napoleon paid no attention to the proposal. After the victory of Austerlitz, Talleyrand again pressed upon his notice, but equally without effect. Napoleon exclaimed, 'If you would apprise the ministers of the empire with which Talleyrand was accustomed to repeat any advice which he considered important; and we find Talleyrand speaking of Napoleon as one who could not be served because he would not listen to advice. And we cannot but see in the difference of opinion just mentioned, the commencement of that coolness which induced Talleyrand, on the 9th of August, 1807, to resign the portfolio of

foreign affairs and accept the nominal dignity of vice-grand- emperor of the empire in addition to the titles of grand-chamberlain and prince of Benevento, which had previously been conferred upon him. An unprecedented career of victory and triumph had rendered Napoleon subject to the consciousness of important services had rendered Talleyrand impatient of neglect; and the alienation thus originated was increased and confirmed by the death of Josephine, his devoted and affectionate wife. He was the most intimate friend and forerunner of that part of the emperor's court, and their silly and vulgar wives, who could not pardon M. de Talleyrand his superior refinement, and who had all in turn smothered under his insupportable sarcasm. Napoleon in exile is said to have reprieved one of his ex-ministers who had returned to France and rendered necessary by his stock-jobbing propensities. It is not impossible that the minister may have speculated more deeply in the funds than was altogether proper; but had there been no other reason for his dismissal, Napoleon could, and often did, wink at multitudes in his own delinquencies. M. de Talleyrand, in his character of grand-chamberlain, did the honours of the imperial court at Erfurt; and was on more than one occasion privately consulted by the emperor, who one day said, 'We ought not to have refused the crown to him.'

At every turn of his career Napoleon was flattered, and rendered necessary by his stock-jobbing propensities. It is not impossible that the minister may have speculated more deeply in the funds than was altogether proper; but had there been no other reason for his dismissal, Napoleon could, and often did, wink at multitudes in his own delinquencies. M. de Talleyrand, in his character of grand-chamberlain, did the honours of the imperial court at Erfurt; and was on more than one occasion privately consulted by the emperor, who one day said, 'We ought not to have refused the crown to him.'

In 1812 M. de Talleyrand is said to have predicted the overthrow of Napoleon. When General Bluck was sent to Rome to confer with the pope, Napoleon, then at Lodi, had orders to be given to the Holy Father to arrest his friend, but Talleyrand, who had arranged for Bluch's appointment, advised him with a view to his remaining the portfolio of foreign affairs, but without success. In 1814 he reappeared on the stage of active life on his own account. In 1814, as vice-grand-elector of the empire, he was a member of the French legislature, and represented the department of the Bed by his deputy Talleyrand. The treaty of Luneville, secularising the ecclesiastical principalities of Germany; the treaty of Amiens, recognising on the part of England the conquests of France, and the new form given to the Continental states by the convention of Elsinore, which gave them to the Czaspuline republic; all bear the impress of the peculiar views of M. de Talleyrand. And the minister of foreign affairs was fully aware of his own consequence. In 1801, when a crisis of the imperial government was produced by the defection of Bourbon L'Archevech, he wrote to Napoleon:—'I regret being at a distance from you, for my devotion to your great plans contributes to their accomplishment.' After the battle of Ulm, Talleyrand addressed to the emperor an attempt to impose on him the necessity of the preponderance of France, by uniting Tyrol to the Helvetic republic, and erecting the Venetian territory into an independent republic interposed between the kingdom of Italy and the Austrian territories. He proposed to reconquer Austria by this arrangement by concluding with the whole of Wallachia, Moldavia, Bessarabia, and the northern part of Bulgaria. The advantages he anticipated from this arrangement were that of removing Austria from the sphere of French influence, and of extinguishing it, and that of raising in the East a power, better able than Turkey to hold a balance with Russia. Napoleon paid no attention to the proposal. After the victory of Austerlitz, Talleyrand again pressed upon his notice, but equally without effect. Napoleon exclaimed, 'If you would apprise the ministers of the empire with which Talleyrand was accustomed to repeat any advice which he considered important; and we find Talleyrand speaking of Napoleon as one who could not be served because he would not listen to advice. And we cannot but see in the difference of opinion just mentioned, the commencement of that coolness which induced Talleyrand, on the 9th of August, 1807, to resign the portfolio of

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the head of a victorious army anything beyond the limits of France in 1792, gave more favourable terms to M. de Talleyrand, the representative of a nation upon which they had just forced a King. He baffled the emperor Alexander, who had angrily said, 'Talleyrand conducts himself as if he were minister of Louis XIV.' On the 5th of January, 1815, he signed, with Lord Castlereagh and Prince Metternich, a secret treaty, having previously obliged Prussia to remain content with the cession of the territory ceded by the Emperor Napoleon to the grand-duchess of Warsaw. The imbecility of the Bourbons, by inviting the descent of Napoleon at Frejus, again unsettled everything. M. de Talleyrand dictated the proclamations of Cambrai, in which Louis XVIII. consented to the union of the two countries. He was not surprised at the preparation! He suggested the more liberal interpretation of the charter, announced from the same place. He obtained an extension of the democratic principle in the constitution of the Chamber of Deputies, recommended the rendering the peerage hereditary, and induced the king, restored for a second time, to institute a cabinet council, of which he was nominated the first president.

The constitutional monarchy, the object of his earlier wishes, was now definitively established; but part of his function was employed under his country's decision. In his note of the 21st of September, 1815, he protested, as prime minister, against the new terms which the aliens intended to impose upon France. He said they were such conditions as only could come after a war; and he himself would not consent that the war had been carried on against the possession of the territory, that is, the sovereignty, possession and sovereignty being identical. But when war was conducted against a usurper in behalf of the legitimate possessor, the war was proposed, as he thought, for the recovery of territory. But the high powers have viewed the enterprise of Bonaparte in the light of an act of usurpation, and Louis XVIII. as the real sovereign of France: they have acted in support of the king's rights, and ought to support them; and the only chance of his subservience that appears in the light of his life is contemplated as a whole, the bears the imprint of a unity of purpose animating his efforts throughout. Freedom of thought and expression, the abolition of antiquated and oppressive feudal systems and the most objectionable powers of the old, are the promotion of the establishment of a nation's religion, and a constitutional government compounded of popular representation and an hereditary sovereign and aristocracy—these were the objects of the government which he proposed to advance in the arena of politics. He attempted to approach this ideal as far as circumstances would admit at all periods of his long career; and he ended by being instrumental in establishing it. No act of cruelty has been substantiated against him; and the only charge of base subversion that appears to be satisfactorily proved, are his participation in the attempt to extort a bribe from the American envoy, and in the violation of an independent territory in the seizure of the Duc d'Enghien. His literary was subordinate to his political character. It was difficult to separate the writings published in his name really his own. Latterly, we are informed upon good authority, he was in the habit of explaining his general views on a subject to some one whom he employed to bring this communication to a shape; and when the substance had been alluded to him, he modified and retouched it until it met his views, throwing in a good deal of that wit which gave zest to his conversation. The domestic life of M. de Talleyrand has been almost ever a subject of remark, including it is poisoned by the small wit of the coteries of Paris.

The report upon education of 1791; a report to the first consul upon the best means of re-establishing the diplomatic service of France; the essays upon colonization, and the commercial relations of England and America; and the edict of M. de Reindeer—may all be regarded as his own composition. The first is the most commonplace; the other three are master-pieces in their different ways. He bespeak an elegant and accomplished mind, a shrewd insight into character and the structure of society, and a felicitous and graphic power of expression. The wit of M. de Talleyrand was the wit of intellect, not of temperament. It was often full of meaning; always suggestive of a sublime quality of thought and observation. By this line of conduct he was materially instrumental in creating a liberal party within the pale of the constitution; and to the existence of such a party was owing in no small degree the result of the revolution of 1830.
the immense number of widely removed characters and events of which he was the contemporary. It may be said on the one hand that he accomplished nothing which did not in some manner bring about; but on the other it may be said, with equal plausibility, that scarcely any of the leading events which have occurred in France in his day would have taken the exact shape they assumed had not his hand interfered to give them somewhat of a bias or direction. Next to Napoleon, he certainly is the most extraordinary man the revolutionary period of France has given birth to.


TALLIS, THOMAS, who is considered the patriarch of English cathedral music, was born about the same period as the famous Italian ecclesiastical composer Palestrina, whose birth took place in the year 1529.

It has been stated, but most probably erroneously, that Tallis was organist to Henry VIII. and his successors. He undoubtedly was a gentleman of the chapel to Edward VI. and Mary; and under Elizabeth the place of organist was added to his other office. He seems to have devoted himself wholly to the duties of the church, for his name does not appear to anything in a secular form. His entire Service, including prayers, responses, litany, and nearly all of a musical kind comprised in our liturgy, and in use in our cathedrals, appears in Dr. Boyce’s Collection, together with an anthem which has long been in high repute with the admirers of severe counterpoint. But for the smaller parts of his Service he was indebted to Peter Marbeck, organist of Windsor, who certainly is entitled to the credit of having added those solemn notes to the suffrages and responses which, under the name of Tallis, are still retained in our choirs, and listened to with reverential pleasure. [MARBECK.]

In 1575 Tallis published, in conjunction with his pupil, Bird (or Byrd), Cantiones Sacrae, master-pieces of their kind; and these are rendered the more remarkable from having been protected for twenty-one years by a patent from Queen Elizabeth, the earliest means of keeping his work from being destroyed. One of these, 'O saeculum convivium,' was adopted by Dean Aldrich to the words 'I call and cry,' and is the above-mentioned anthem, which still continues to be frequently performed in most of our cathedrals. Two more of his anthems are printed in Dr. Arnold’s Collection.

Tallis died in 1595, and was buried in the parish church of Greenwich, in the chancel of which Strype, in his continuation of Stowe’s Survey, tells us he saw a brass plate, on which was engraved, in old English letter, an epitaph, in four lines, containing a brief history of this renowned composer. The plate was carried away, and most likely sold by weight, by some barberian, when the church was repaired about a century ago.

The use of notched sticks or tallies may be traced to a very remote period, and there is reason to believe that they were used among the ancient Egyptians for keeping accounts. Some writers conceive that the Greek symbol {opusai} was in some cases a species of tally, which was used between contracting parties; being broken in two, and one-half given to each. In the Pictorial Bible-note on Ezek. xxxvi, 20, much useful information is brought together on the subject of writing or marking with notches upon sticks. The writer of that note refers to the tablets of wood called oszroes, upon which the Athenians inscribed the laws of Solon, and to the practice of the ancient Britons, who, he says, 'used to cut their alphabet with a knife upon a stick, which, thus inscribed, was called Coolden y Beirdd, “the bill of signs of the bard,” or the Bardic alphabet.' And not only, he continues, “were the alphabets such, but compositions and memorials were registered in the same manner.” These sticks, he adds, were commonly squared, but were sometimes three-sided; each side, in either case, containing one line of writing. A cut which accompanies the note from which we quote, shows the manner of making several inscribed sticks in a frame, so that they might be read conveniently. Another illustration, of later date, is the clorg-almanac described by Dr. Plot, in 1696, as still common in Staffordshire. Such calendars, which were the almanacs, but composed of memorials marked by notches of different forms and sizes, were sometimes made small enough to carry in the pocket, and sometimes larger, for hanging up in the house. Similar calendars are said to have been formerly used in Sweden. Perhaps the most curious of the illustrations collected in the notes

Fig. 1.

TALLY, or MOUNTAIN. [HATCHETTY.]

TALLY-TREE. [STILLINGIA.]

TALLY. This word appears to be derived from the French taille, or taiter, each of which expresses the idea of cutting or notching.

referred to is the Saxton Reive-Pole, which either is, or has been down to a recent period, used in the Isle of Portland for collecting the yearly rent paid to the king as lord of the manor. This rent, which amounts to 1½. 1¼. 3d., is collected by the reeve, or steward, every Michaelmas; the sum which each person has to pay being scored upon a squared pole, a portion of which is represented in the subjacent cut, with figures to mark the amount indicated by each notch. ‘The black circle at the top,’ observes the work from which we quote, ‘denotes the parish of Southwell, and that side of the pole contains the account of the tax paid by the parishioners; each person’s account being divided from that of his neighbour by the circular indentations between each. In the present instance the first pays 23d., the second 4s. 2d., the next one farthing, and so on.’ The other side of the pole which is represented in the cut is appropriated to the parish of Warken, of which the cross within a circle is the distinctive mark. The tallies used in the Exchequer (one of which is represented by fig. 2) answered the purpose of receipts.
as well as simple records of matters of account. They consisted of squared rods of hazel or other wood, upon one side of which was marked, by notches, the sum for which the tally was an acknowledgement; one kind of notch standing for 1000L, another for 100L, another for 20L, &c. The tallies were kept in a large, open book on each side of the Exchequer, opposite to each other, the amount of the sum, the name of the payer, and the date of the transaction, were written by an officer called the writer of the tallies; and after this was done, the stick in the Exchequer was broken into two or more parts in a manner that each piece retained one of the written sides, and one-half of every notch cut in the tally. One piece was then delivered to the person who had paid in the money, for which it was a receipt or acquittance, while the other was kept in the Exchequer. The Exchequer observs respecting these rude and primitive records. The use of them was very antient; coeval, for aught I know, with the Exchequer itself in England. They were finally discontinued at the remodelling of the Exchequer in 1714; and it is worthy of recollection that the fire by which the Houses of Parliament were destroyed was supposed to have originated in the overheating of the fluxes in which the discarded tallies were being burnt. Clunay as the contrivers may suppose that the company he was an associate) wore mourning for him for forty days, and a variety of honours were paid to his memory at the principal theatres throughout France and the Netherlands. Talma is said to have created seventy-one characters, amongst the most popular of which were those of Chrestes, Calippe, Nero, Manlius, Caesar, Cinna, Augustus, Coriolanus, Hector, Macbeth, Hamlet, Othello, Leicester, Silvia, Regulus, Danville (in L'École des Vieillards); Leonidas, Charles VI., and Henry VIII. He has been accused, remarks of his biographers, of having spoken the verse of tragedy as though it was prose; but this avoidance of the jingle of rhyme was one of the greatest improvements which he introduced upon the French stage. In person he was about the middle height, square built, and with a most expressive and noble countenance. His voice was exceedingly fine and powerful, his attitudes dignified and graceful. In private life he was distinguished for his manly frankness, his kind disposition, and unaffected manners. He spoke English perfectly, and was a great admirer of England and her institutions. He was the friend and guest of John Kemble, and was present in Covent Garden Theatre when that great actor took his leave of the stage. (Almanach des Spectateurs, 1827; Biographie Nouvelle des Contemporains; New Monthly Mag.; Personal Recollections.)

TALMUD. [HEBREW LANGUAGE.] TEXT. 17

TALPA. (TA.L.)*

TALPAOREX, M. Lesson's name for a genus of Sorci.**, comprising the Shrew-mole. [Vol. xxii. p. 266.]

TALPIDAE, the family of Mole. The genus Talpa of Linnaeus, as it stands in the 12th edition of the Systema Naturae, between the genera Delphis and Sorex, comprises two species only, Talpa Europaea, the Common Mole, and Talpa Asiatica. [CHRY SOCIIORI.] Cuvier places the Mole, confining them to the genus Talpa, between Sorex (SORECI) and CORDYLUS. Mr. Swainson places the genus Talpa between Chrysoclorius and Centenes. [TENNER.] ORGANIZATION. SKELETON.—The cranium is elongated and pointed, and there is a peculiar bone for the support and working of the muzzle. The part which extends from the internal

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side of the jaws terminates in three points, the one in the middle larger and more distant from the external edge than the other two. The very short arm attached by means of a long balebone, and sustained by a vigorous clavicle, carries an extremely wide hand, the palm of which is always turned outwards or backwards. No known

*Skate Bone of . (De Blainville.) The usual bone and necessity nasal sphen-o-shaped bone are here shown.

living form has the compressed palanginal bones seen in Glyptodon except the mole. The second phalanx of the anterior digits or fingers of the mole is the only known living analogue of the similar bone in the hind-foot of Glyptodon. The thumb, like that of the birds and bats, has a elevation or crest affording room for the large pectoral muscles. The pelvis and hinder extremities are comparatively feeble. The bones of the paws are not joined.

This bone framework is set in motion by very powerful muscles. Those of the anterior extremities, the chest, and the neck are most vigorous, and in the cervical ligament a peculiar bone is even formed. The wide hand, which is the great instrument of action, and performs the offices of a pickaxe and shovel, is sharp-edged on its lower margin, and, when clothed with the integuments, the fingers are hardly distinguishable, but the terminating claws project long, strong, flat, and trenchant.

Let us compare for a moment the bats with the moles with reference to their locomotion. Both are insectivorous, but how widely different in their conformation.

The bat has to winnow its way through the air: the mole, like the bat, has to resist against a given medium, a very different one, certainly; and is endowed with a power of moving through that medium by means of a modification of the locomotive organs beautifully adapted to its density. Instead of the lengthened bones of the forearm that so well assist the bat to make its way with outstretched wing through the air, all in this part of the organization of the mole is short and compact, to enable it to bore through the dense medium where it is to live and move and have its being. The development is all anterior: the fore part of the body forms an elongated cone; the posterior part is narrow and small, and the whole of its proportions are admirably fitted to assist it, so to speak, in flying through the earth. The long and almost round scapula, the expanded humerus, the enormous power, in short, of the anterior extremities, and the great strength and compactness of the fingers, are all fitted for the digging duty they have to do. Add to this a short-cut velvety coat, to which no particle of soil ever adheres, and you have the perfection of organization for rapid progress through the ground.

Nor is it void of interest to observe the niceties of adaptation according to circumstances. The *Chrysoglossus* (Tulpa auris of the older authors) is an inhabitant of Africa, and burrows in sand. This medium required a modification of organization different from that required to permeate the heavier soils, and we have it. Though some of the bones are strong, the general strength is less than in the common Mole. The principal burrowing instrument is the great double anterior toe (ring-finger), and there is an enormous development of the pisiform bone.

In the museum of the Royal College of Surgeons, in London, No. 292 G, of the Physiological Series, shows the anterior half of the body of a Mole (Tulipa Europea, Linn.), in which the diaphragm and principal muscles of the right extremity are dissected and exposed, as illustrative of one of the principal structures for burrowing.

*Nervous System and Sense.— Touch.*—The muzzle of the mole is evidently a delicate organ of touch, and that sense is considerably developed in the large and broad hands and feet. Neither is the tail without a considerable share of sensation, to give notice to the animal of the approach of any attack from behind.

*Taste and Smell.*—The gustatory and olfactory nerves, especially the latter, appear to be very sensitive.

*Sight.*—Almost rudimentary. The little eye is so hidden in the fur, that its very existence was for a long time denied. Its appearance for eyes, occupy the elevation to the animal on its emerging into the light; and indeed more acute vision would only have been an incumbrance. No. 1772 (Mus. Coll. Reg. Chr., Phys. Series) is the anterior part of a mole (Tulipa Europaean, Linn.), showing the minute circular palpebral orifices defended by the short thick fur.

*Hearing.*—But if the sight be imperfect, the sense of hearing is very highly developed, and the tympanum very large, though there is no external ear, or rather, no projecting concha. No. 1608, in the department of the museum of the Royal College of Surgeons above referred to, exhibits the anterior part of a mole (Tulipa Europeaean, Linn.), from which the hair has been removed, to show the external orifices of the ears and eyes, in both of which bristles are placed. No. 1009 is also the anterior part of the same animal with the fur left on, showing the entrance to the meatus auditorius externus unprovided with a projecting concha, or external ear, which would be an impediment in the act of burrowing, and an unnecessary appendage: the meatus is defended in this animal, which lives habitually in the soil, by the smallness of the external opening. John Hunter, in his Manuscript Catalogue, introductory of this part of the series, observes that an external concha is not to be found in many animal's whose life is principally led underground, such as the mole; and perhaps because the earth assists considerably in vibration.

There is nothing that calls for any particular notice in the *Digestive System* of the Mole. The alimentary canal is short, simple, without a cecum. The vascularity of the mole corresponds with the activity and rapidity of its digestive powers.

*Generative and Urinary Systems.*—No. 2505 of the Physiological Series in Mus. Coll. Reg. Chr. exhibits a mole with the abdomen laid open to show the testes as they appear in winter. They are lodged in large cremasteric pouches in the perineal region, making no projection externally. The right testis is drawn into the abdomen by the side of the bladder, and its posterior extremity may be seen attached to the inverted cremaster: the left testis has its anterior extremity projecting into the abdominal cavity. The prostatic glands, which consist of an aggregate of small tubes, are just visible behind the bladder. No. 2506 is a mole killed in February, and prepared to show the increased size of the testes, and the commencing sexual development of the prostatic canes. No. 2507 is a mole killed in the beginning of March, and prepared to show a further increase of the testes and accessory prostatic glands; the latter have now advanced forwards on each side of the urinary bladder, so as to encompass its neck: the left testis has been drawn back into the abdomen, and its attachment to the inverted cremasteric pouch displayed. No. 2508 is a mole killed about the latter end of March, and dissected to show the complete development of the testes and prostatic glanides. The long penis and its two crura, surrounded by the erectors muscles, are also shown. No. 2509 is a mole which was killed in autumn, prepared to show the collapsed state of the testes, and the atrophied condition of the pro-
The increase and decrease of the testes in Brads and Prazex. is a common change to all animals which have their season of copulation fixed. That great physiologist, we find the testicles are reduced to a very small size in winter; and in the land-mouse, mole, &c., this diminution is still more remarkable. Animals, on the contrary, who are not in a state of nature, have no change take place in their testicles; and not being much affected by seasons, are consequently always in good condition, or in a state to which other animals that are left to themselves can only attain in the warmer season. Therefore in man, who is in the state we have here, the testicles are nearly of the same size in winter and in summer; and nearly, though not exactly, the same thing may be observed in the horse, ram, &c., these animals have their season of mating a certain degree. The variation above taken notice of is not confined to the testicles, but also extends to the parts which are connected with them: for in those animals that have their seasons for propagation the most distinctly marked, as the land-mouse, mole, &c., the vesicles are found in the same way, but only discernible in that way, the spring they are very large, varying in size in a manner similar to the testicle. It may however be alleged that the change in these bags might naturally be supposed to take place, even admitting them to be seminal reservoirs; but what happens in the prostate gland, which has never been supposed to contain semen, will take off the force of this objection; since in all animals which have such a gland, and which have their season for propagation, it undergoes a limited diminution. In the mole the prostate gland is hardly discernible, but in the spring becomes very large, and is filled with mucus.

No. 2307 exhibits the posterior part of a mole (Talpa europea), with the female generative and urinary organs exposed. The uterus is turned to the right side, principally to display the course and attachments of the ovarian and uterine ligaments. The ovarian ligament commences anterior and external to the kidney, and carries forward with it a fold of the peritoneum as it advances to the ovaries. The body of the ovary is rounded, and runs along the posterior edge of the preceding fold to the part corresponding to the abdominal ring in the male. It expands upon the face. The left ovary and the uterine coil of the same sex are also exhibited. The ovary is tuberculated, and inclined in an almost complete peritoneal capsule. The oviduct is attached to this capsule, and pursues a wavy course to the horn of the uterus. No. 2308 displays the female organs of a mole in situ, the ventral parietes of the abdomen and chylcopteric viscera having been removed. The cornua uteri, cylindrical tubes, describe three abrupt curves before forming the corpus uteri, with which they form almost a right angle. The body of the ovary is continued without any constriction or interruption into the vagina: the whole canal is somewhat flattened, and is disposed in two or three vertical curves or folds before it leaves the abdomen. The uterus is the hinder half of a mole, with the female organs similarly displayed, but more injected. The cornua uteri are dilated, to display the extent of the broad ligaments. No. 2310 is a section of a mole, in which the left ovary, oviduct, and uterine horn, and the back side of the interior of the vagina, have been removed, but exposing the remainder of the generative apparatus in situ, and exhibiting its relative position to the urinary bladder, the rectum, and the pelvis. The contracted area of the uterine cavity, the absence of any os terminalis dividing the vagina into two parts, and the cavity of vesica urinaria, are clearly displayed. A bristle is inserted into the right horn of the uterus, and another is passed through the canal of the bladder to the external meatus. This case sometimes Professor Owen, the author of the catalogue, the urethra, vagina, and rectum open by distinct orifices on the exterior of the body, and all three canals in anterior to the pubic bones, and consequently outside the pelvis.

No. 1284 of the same series exhibits the kidney of a mole injected and longitudinally divided. The un.injected tubuli may be plainly seen extending through the cortical substance, as is shown in the injections of the kidney of the horse, Nos. 1230 to 1214, both inclusive. (Cat. vol. ii.)

**Generic Character.**—Body stout and thick, furry; head elongated, pointed; muzzle cartilaginous, strengthened by the snout-bone; eyes very small; no external ears; anterior feet short and wide, with five united toes armed with trenchant nails proper for digging; posterior feet with five toes also, but weak; tail short.

**Dental Formula.**—In incisors 6; canines 1–1; molars 7–7; 7–7; = 44.

**Example.** Talpa europaea, the common mole.

This well-known animal, so familiar to all that it would be a needless waste of space to describe it, is La Taupe of the French, Talpa of the antient and modern Italians, Topo of the Spanish, Tausper of the Polish, Tawseer of the Germans, Mol of the Dutch, Mulead and Surk of the Swedes, Muldvarp of the Danes; Mole, Mole-warp, Molcharp, and Wat of the modern British; and Gwadd and Tercosor of the antient British.

**Habits, Food, Reproduction and Gastron.**—A subterraneous life, says Pennant, speaking of the mole, 'being allotted to it, the seeming defects of several of its parts vanish; which, instead of appearing maimed or unfinished, exhibit a most striking proof of the fitness of their contrivance. The breadth, strength, and shortness of the fore-feet, which are inclined sideways, answer the use as well as the form of hands, to scoop out the earth, to form its habitation, or to pursue its prey. Had they been longer, the falling in of the earth would have prevented the quick repetition of its strokes in working, or have impeded its course: the oblique position of the fore-feet has also this advantage, that it flings all the loose soil behind the animal.

'The form of the body is not less admirably contrived for its way of life: the fore-part is thick and very muscular, giving great strength to the action of the fore-part, enabling it to dig its way with great force and rapidity, either to pursue its prey or elude the search of the most active enemy. The form of its hind parts, which are small and taper, enables it to pass with great facility through the earth that the fore-feet had flung behind; for had each part of the body been of equal thickness, its flight would have been impeded, and its security precarious.

'The skin is most excessively compact, and so tough as not to be cut but by a very sharp knife; the hair is very short and close-set, and softer than the finest silk; the general colour is black, not but that there are instances of these animals being spotted, and a cream-coloured breed is sometimes found in my lands near Downing.
The smallness of the eyes (which gave occasion to the antients to deny it the sense of sight) is to this animal a peculiar happiness; a small degree of vision is sufficient for an animal ever destined to live underground; had these organs been larger, they would have been perpetually liable to the ill-fortune of being quite swallowed by the earth falling into them; but nature, to prevent that inconvenience, hath not only made them very small, but also covered them very closely with fur. Anatomists mention (besides these) a third very wonderful circumstance, which secures the animal, that excepting it be raised by the hand, there is the power of withdrawing or exerting them, according to its exigencies.

To make amends for the dimness of its sight, the mole is highly compensated by the great perfection of two other senses, those of hearing and of smelling: the first gives it notice of the most distant approach of danger; the other, which is equally exquisite, directs it in the midst of darkness to its food; the nose also, being very long and slender, is well formed for thrusting into small holes in search of the worms and insects that inhabit them. These gifts may with reason be said to compensate the defect of sight, as they supply in this animal all its wants and perform all the purposes of that sense.

It is supposed that the verdant circles so often seen in grass-grounds, called by country-people furry rings, are owing to the operations of these animals, who, at certain seasons of the year, penetrate by circularly sinuous and sinuous, which, loosening the soil, give the surface a greater fertility and rankness of grass than the other parts within or without the ring.

The mole breeds in the spring, and brings four or five young at a birth; it makes its nest of moss, and that always under the largest hillock, a little below the surface of the ground. It is observed to be most active, and to cast up most earth, immediately before rain, and in the winter before a thaw, because at those times the worms are beginning to be in motion and approach the surface: on the contrary, in very dry weather this animal seldom or never forms any hillocks, as it penetrates deep after its prey, which at such seasons retires far into the ground. During summer it runs in search of snails and worms in the night time among the grass, which makes it the prey of owls. The mole shows great art in skinning a worm, which it always does before it eats it; stripping the skin from end to end, and squeezing out the contents of the body.

Thus far Pennant: but the most diligent and instructive historian of the mole is Henry Le Court, who, flying from the terrors that came in the train of the French revolution, took for his refuge in the country, and as attendant on a court, became the biographer of this humble animal. The discoveries of this indefatigable observer have been laid before the public in the work De Vaux (1803), and a summary of them by Geoffrey St. Hilaire, in the Journal des Sciences Naturelles. Le Court himself, who latter visited Le Court for the purpose of testing his observations, and appears to have been charmed by the facility and ingenuity with which Le Court traced and demonstrated the subterraneous Labours of this obscure worker in the dark.

One of the experiments which Le Court made afforded ample proof of the rapidity with which the mole will travel along its passages. He watched his opportunity, and carefully made out on its plan the three distant points from its sanctuary or fortress, to which point the mole's high road leads, Le Court placed along the course of that road between the mole and the fortress several little camp-colours, so to speak, the staff of each being a straw and the flag a bit of paper, at certain distances, the straw penetrating down into the passage. Near the end of the subterraneous road he inserted a horn, the mouth-piece of which stood out of the ground. When all was ready, Le Court concealed himself so as to have a view of all the scene within hearing from their propriety, and the little gentleman in velvet, whose presence at the spot he had well ascertained, was affected accordingly. Down went the little flags in succession with an astonishing celerity, as the passage along which towards his sanctuary he came in contact with the flag-straws; and such mettle had terrier put into the animal's heels, that the spectators affirmed that its swiftness was equal to the speed of a horse at a good round trot.

This experiment was perfectly satisfactory as to the auditory and travelling powers of the mole; but another made by Le Court equally proved that the amplitude of vision possessed by the animal is amply sufficient for its wants, and that, with all the imperfections of this sense, its sight warns it of danger. Le Court took a spare water-pipe or gutter open at both ends. Into this pipe he introduced a mole, and afterwards stained that excreted urine by standing by to watch the result, at the farther end of the tube. As long as the spectators stood motionless, the introduced mole made the best of his way through the pipe and escaped; but when they moved, or stuck a finger, the mole stopped and then retreated. Several repetitions of the experiment produced the same results.

But we must describe the mole's domain. The principal point is the habitation, or, as it has been termed, the fortress, and is constructed under a considerable hill, raised in some secure place, often at the root of a tree, under a bank, or any shelter that offers protection. The fortress is domed by a cement, so to speak, of earth which has been beaten and compressed by the architect into a compact, oval-shaped mass, and is thus formed at the base, and communicates with a smaller upper gallery by means of five passages, which are nearly at equal distances. Within the lower and under the dome, the cave has access to the upper gallery by three similar passages. From this habitation, we should here observe, the high road by which the proprietor reaches the opposite end of the encampment extends, and the various galleries or excavations open into this road, generally carrying out and extending in its search for food, and which has been termed its hunting-ground. But to return to the chamber. From it another road extends, which directs it at first in the direction of several inches, when it again rises to open into the high road of the territory. Some eight or nine other passages open out from the external circular gallery, but the offices of these never come opposite to the passages which connect the external gallery with the tunnel*. The extent of these passages is greater or less, according to circumstances, and they each return by an irregular and semicircular route, opening at various distances from the habitation into the high road, which differs considerably from all the other passages and excavations, both in construction and with regard to the use to which it is applied. From the habituation this road is carried out nearly in a straight line and forms the main passage of the mole, which runs through the common excavations of the encampment, and the alleys leading to the hunting-ground which open into it on each side. In diameter it exceeds the body of a mole, but its size will not admit of two moles passing each other. The walls of this road are thick and smooth, and do not exhibit the pores of them, become smooth and compact, and its course is remarkable for the comparative absence of mole-hills, which are frequent in connection with the alleys and quarreries, as they have been termed, in constructing which the earth is removed out of the way to the surface. Sometimes a mole will lay out a second or even a third road in order to the extension of its operations. Sometimes several individuals use one road in common, though they never meet in their hunting-grounds. But in the event of common usage, if two moles should happen to meet, one must retreat into the nearest alley, unless both should be pugnacious, in which case, the weakest is often slain. In forming this tunnel, the mole's instinct supplies the place of science, for he does not know the true depth, but if it is carried under a road or a stream, a foot and a half of earth, sometimes more, is left above it. Thus does the little animal carry on the subterraneous works necessary for his support, travelling, and comfort; and his tunnels are the foundations of his posterity.

The alleys opening out from the sides of the high road have generally a somewhat downward inclination from their commencement towards their end. It has been observed that when, on opening one of these alleys, a pleasant...
A supply of food is found, the mole proceeds to work out branch alleys from its termination, up-heaving new mole-hills as it advances in quest of prey; should however the soil be barren of the means of existence, the animal commences another alley at a different part of the high road. The quality and humidity of the soil, which regulate the abundance of earth-worms, determine the greater or less depth of the alleys.

The main road being the highway of communication to its different hunting-grounds, it is necessarily passed through regularly in the course of the day, and it is in this road that the mole-catcher sets his traps or practices his devices to intercept the animal between its habitation and the alley where it is carrying on its labours. Some mole-catchers will tell you that the hours when the moles move are nine and four, and others that, near the coast, their movements are influenced by the tides; to which statements the hearer is at liberty to give as much credence as he chooses. Besides the various traps which are set for them, there is, or very lately was, a man who travelled the country with a dog and destroyed them without any trap at all, by the following process: Taking his station at the proper time and place, attended by his dog, and armed with a spear or spud, he waits till the dog indicates the presence of the mole, and then advances or spuds the animal out as it moves in its run. Pointers will stop at moles as steadily as at game, when the latter are straying on the surface.

Besides the excavations already noticed, the moles pursue another mode of hunting in light loose soils, newly sown, when gentle rains have led the earth-worms towards the surface, along which they follow the worms up, rapidly digging a shallow trench in the superficial layer of the soil. The female, when with young, is said to be principally addicted to this easier method of subsistence.

All the animal passions are strong in the mole, and it is a most voracious animal. It has been supposed that it was a vegetable as well as an animal feeder, and, as a proof of the former, the fragments of roots, &c, found in its stomach have been appealed to; but there can be no doubt that these vegetable matters had been conveyed into the stomach with the earth-worms (their favourite food) and the larvae of insects. The structure of its teeth indicates that its food should be animal, and indeed mice, hares, frogs, and even birds have been known to fall victims to its voracity; but it eschews toads even when pressed by hunger, deferred probably by the acrid secretion of their skin. [1] All doubts as to the carnivorous nature of the mole have however been removed by the experiments of M. Flourens, who found that moles restricted to carrots, turnips, various kinds of herbs, and vegetable substances which were abundantly supplied to them, died of hunger. The mole indeed appears to require much nourishment, and a short rest proves fatal to it.

We must not omit to notice the provision of this animal to secure a supply of water, for its voracity makes it a great drinker. If a pond or ditch be at hand in those parts where many moles use the same common highway, a run is always formed to the reservoir: when it is too distant, the animal sinks little wells in the shape of deep perpendicular shafts, which hold water. These wells have sometimes been seen brim-full.

During the season of love, at which time bloody battles are fought between the males, the male pursues the female with ardour through various districts. These runs are not without their mode of termination, but the declaration of love: a French nobleman is said to have obtained the hand of a lady by pursuing her, in a manner similar to that of a mole, for twelve weeks; when she was found to be his. The French say: "Quand la souris a commencé à creuser, il est temps de se retirer." [2]

The sexual attachment appears to be very strong in the moles. Le Court often found a female taken in his trap, and, as it were, close to her. The period of gestation is two months at least, and the young are generally produced in April, but have been found from that month to August. From four to five is the general number, though from three to seven have been recorded, and in one case seven* in one nest.

The nest is distinct, usually distant from the habitation, and not always crowned with a hillock; but when a hillock exists, it is much larger than an ordinary mole-hill. It is constructed by enlarging and excavating the point where three or four passages intersect each other; and the bed of the nest is formed of a mass of young grass, root-fibres, and herbage. In one case, Geoffroy St. Hilaire and Le Court counted two hundred and four young wheat-blades.

In the Museum of the Royal College of Surgeons in London, No. 3573 of the Physiological Series is the posterior half of a pregnant mole, with the uterus and three foetuses, each about one inch in diameter, lying in a horizontal position. The ovarium contains a thin and transparent peritoneal capsule, around which the oviduct may be observed passing in the form of an opaque, white, narrow band: the uterine dilatation next the left ovarium remains open, and the following parts fall away. The other uterine dilatations are left entire; they resemble blind pouches developed from one side of the uterine tube. No. 3574 is the posterior extremity of the trunk of a pregnant mole, with five foetuses displayed in situ; one of the dilated chambers of the left uterine horn is laid open, and the foetus is exposed with its membranes. The placenta is a spongy, vascular substance, in the form of an oblong flat band, with its long axis parallel to that of the fetus. One of the uterine chambers, with the corresponding chorionic sac, is laid open in the right horn of the uterus, and the foetus is displaced.

*No. 3575 presents the female organs of a pregnant mole with four foetuses, each one inch and a quarter in length; one of them resembles a spade, the other two are hung suspended by their membranes and the placenta from the pariets of the uterun; in the lower of these embryos the foetal placenta is partly separated from the maternal, showing the characteristic features of the latter, which receives the foetal placental filaments; the maternal placenta is minutely injected, but no portion of injection has passed into those filamental parts which are here exposed; the capacity of the chorion is very little larger than the foetus which it contains.

In the embryo which has been displaced from the chorionic sac, the short umbilical cord, and the characteristic form of the short and strong fossorial anterior extremities, may be discerned: the external apertures of the eyes and ears are completely closed. The canal leading from the uterine horns to the external opening of the vagina is laid open, showing the absence of any os intime dividing the uterus from the vagina; a bristle is passed into the omentum, which is continuous through the clefts. The author of the catalogue (Professor Owen) observes that the peculiar position of the vagina of the mole, on the outside of the pelvis, is well displayed in No. 3570, above noticed, and that by this modification the contracted pelvis offers no impediment to parturition. [3]

Heavy charges have been brought against the mole by agriculturists and horticulturists, and the more grave accusation of being ancillary to the destruction of dykes has made it the subject of in some instances very violent attacks. The most interesting History of British Quadrupeds, sums up the evidence against it and in its favour thus:—In order to arrive at a true solution of the question, it is necessary to divest our minds as well of the prepossessions of the naturalists as of the prejudices of the agriculturist, and to see what we can find, as in most other cases, that the truth lies between the two extremes. According to its accusers, * Loudon's 'Magazine of Nat. Hist.', vol. viii.
there is no portion of its labours, no peculiarity of its habits, no function of its organization, that is not the means or the cause of ravage and devastation to our cultivated fields and to the soil, say the inconsidered destroyer, the mole, by its subterranean roads; the crops are killed by the exposure or the destruction of the roots; the plants themselves are overthrown by the construction of the mole-hills, or they perish from the ground being eaten, and their fertility thereby scattered. In the superficial furrows which the animal ploughs up either in search of food or in pursuit of its mate; large quantities of young corn too are carried off by it to form its nest; and, finally, its abandoned forts have the aspect of a vast field-mouse, or other noxious animals. Thus the field and the meadow, the garden and the plantation, are alike the scenes of its ravages; and De Vaux calculates that the loss which it occasions to the spring corn alone may be calculated at one-sixth of the whole produce. Then, on the other hand, these prejudiced judges allow nothing for the benefit which arises from the destruction of innumerable worms, and of insects both in the larva and perfect state: this advantage is in fact denied by De Vaux, who declares that the mole feeds only on the most harmless of those animals, the earth-worm, and that it refuses those which are injurious to mankind. Its more beneficent advocates, on the other hand, contend not only that the injury which it produces in the field is enormous, but that it is more than balanced by the benefit which it produces by turning up and lightening the soil, and especially by its immense destruction of earth-worms and many other noxious animals which inhabit the superficial layer of ground, and by the excreta which the mole throws to the roots of grass, corn, and many other plants. If we examine the real nature and degree of its injuries on the one side, and its utility on the other, we shall probably find that both parties are erroneous. The fact of its devastations cannot be denied, it is only in the degree and extent of them that the estimation is incorrect; and whilst its utility in clearing the ground of worms and similar causes of injury must also be allowed, it can scarcely be sustained that the lightening of the soil by its hilly furrows is at most, more than a very equivocal source of advantage.

Thus we see that 'much may be said on both sides. We have heard advocates for the mole declare that in great sheep-walks whence they have been rooted out, the whole character of the feed has been altered, and the ex-terminators have been obliged to introduce them again, and we have heard such stories denied. Too much stress however may be laid on its services as a destroyer of the earth, which may be well attended with the perdition of the agriculturist by the destruction of an animal that does so much for the soil. [Lumbricus, vol. xiv, p. 196.]

Whatever may be the merits of the case, the persecution of these animals in cultivated countries amounts almost to an inquisition, which the Mole-destroyers have been so far encouraged by the agriculturist that they have not only been expelled, but it has been even proposed to introduce animals which eat moles or mole-hills. The number of moles thus exterminated is shown by the reports of Mr. Beattie, who, in the county of Kincardine, found thirty-five mole-hills covered up in a single day. The number of moles thus exterminated is shown by the reports of Mr. Beattie, who, in the county of Kincardine, found thirty-five mole-hills covered up in a single day.

As to the question whether the species under consideration is the Apalone (srnavly) of Aristotle, who describes this animal as blind, see the article Muron, vol. xv, p. 316. In a more recent treatise, the mole is described as blind throughout the greater part of the continent of Europe and its larger islands. In Greece it is said to be comparatively rare. We are overrun with it in most parts of England and Wales, but it does not appear to have been found in the northern extremity of Scotland, though it is frequent enough in the south. There is no record of its having been seen in the Orkney Isles, Zetland, or Ireland.

The Prince of Mysignano has well figured, in his excellent work, Iconographia della Fauna Italiana, the species under consideration. He describes the Tamas, or Tamas, as the Apalone of Aristotle. In this last species the middle incisive teeth are longer than the rest; in the common mole they are all equal, and De Vaux states that there is some difference, though not great, in the habits and architecture of the two species. Mr. Bell suggests that as both species are inhabitants of Europe, the original name Apalone should be dropped, and Brissou's name, vulgus, be adopted for the common species.

Fossil Moles.

The fossil remains of the mole have been found in the bone-caverns; as, for example, in the cave at Kostierz aro at Paviland (see Buckland, Religiae Diluviane). They have also been found in the bone-caverns in Belgium (Schmerling).

Bone of moles have been obtained from the brown clay of Norfolk: they were, we understand, first taken for the remains of lizards.

The purposes which arise upon this discovery are:--

1st. Are the true fossils of that formation or subsequently introduced? and this their condition might determine.

2nd. Are the fossil remains identical with the bones of the common mole?

An inspection of the remains themselves might convey a solution of both these questions, and we are informed that the fossils are, through the kindness of Professor Sedgwick, about to be sent up to Professor Owen.

But throughout this inquiry it will be necessary to bear in mind that the term mole is not merely applied to the earth, performing all its functions, with little exception, below the surface, and though we might for that reason be led to expect the frequent occurrence of its remains in the fossil bed it is not by any means certain that the mole which has hitherto been described. The danger to be guarded against with regard to those specimens found in the newer and superficial strata is that a burrowing animal may have penetrated into those fossiliferous beds subsequently to its formation and the search of its organized contents.

We therefore look forward to Professor Owen's opinion upon the condition of these remains and their specific distinction with much interest.

TALUS, or TALUT, probably from 'taglio,' lit., a cut, is a term applied by writers on fortification, in speaking of a rampart or parapet, to signify a surface which is inclined to the horizon. Thus the upper surface of a parapet is called the superior talus or slope; and that surface of a rampart or parapet which is towards the country, or towards the town, is called the exterior, or the inferior, talus of the work (fig. 2, Batt.)

The superior talus of a parapet is usually formed in a plane which, if produced towards the country, would cut down the rampart; but, in order that the defenders of the rampart may be able to fire into the covered way in the event of the latter being occupied by the enemy, their muskets being laid upon that slope. The exterior or the interior talus of any work is generally formed in an oblique line of some degrees; such being the inclination at which the surface of earth, of medium tenacity, will stand unsupported.

TAMAN, a peninsular, or rather a delta-island, is formed by the main branch of the river Kuban, which empties itself into the Black Sea, and a small branch of the same river, which flows into the Sea of Azof north of the old fortress of Temruck. The western or large part of the island stretches from the sea of Azof on the north and the Black Sea on the south, and is bounded on the west by the Strait of Yenikule, the ancient Bosporus Cimmerius, and the Bay of Taman. The island resembles the open claws of a lobster, embracing the Bay of Taman. Its length is 30 miles, and its greatest breadth is 22 miles, but the real surface is far from corresponding to these dimensions; the middle of the island being occupied by the large Temruckski Liman, or Lake of Temruck, and the whole of the remaining part being noted by creeks and bays in such a manner as to present rather the skeleton of an island than a real island. The south-western part of Taman, the antient peninsula of Corocandamas (Pomp. Mal. i. 19; Strabo, p. 494. Cosauba) presents a solid mass traversed by several ranges of hills from 150 to 190 feet high, which have been cut down, which the west to east, and near the village of Sennaya-Balka form a bifurcation. One branch runs between the Kubanskoi Liman, or the lake formed by the Kuban before it reaches the sea, and the lake of Temruck, and terminates in a slip of land which divides that lake into two unequal parts. The other branch, the direc-
The Greeks knew this remarkable island under the name of Eion (Blow), and founded several colonies in it. The most considerable of them were—Phanagoria, a famous commercial town, which contained a beautiful temple of Aphrodite of Aptapuron (Strabo, p. 495. C. 3a.); Kepos, or Kepi, a colony of the Milesians; Hermonassa, founded by the Ionians; and Achilleion: some ruins and marbles are the only traces that remain of their antient splendour. The island belonged for a long period to the kingdom of Bosporus, and was afterwards conquered by Pharnaces, the son of Mithridates. At the beginning of the middle ages it belonged to the dominions of the Goths, and afterwards of the Khazars, a Turkish people, renowned for their industry and commerce. It was then known under the name of Tamartarka.

In the tenth century a Russian prince founded there the petty kingdom of Tmutarakan; the greater part of the inhabitants however were Tcherkesians and Turks, and, from the time of the invasion of the Mongols, the Tartars remained the only masters of it. Numerous old tombs still attest their long residence on the island. They were at last driven out by the Russians, who repopulated the country with Cossacks in order to defend it against the invasions of the Tcherkesians beyond the Kuban. There are now only two towns: Tmutarakan, the Tamartarka of the middle ages and the Phanagoria of the Greeks; and the present town of Phanagoria, which was built by the Russians on the shore of the bay of Taman, three miles east from Tmutarakan, on account of its harbour being deeper than that of the latter town.

(Pallas, Bemerkungen auf einer Reise in den Südlichen Provinzen des Russischen Reiches; Dr. Clarke, Travels in Russia. The best map of the island of Taman is contained in the great Atlas of Russia published at St. Petersburg; the map in Pallas's Bemerkungen is also good; that of Dr. Clarke has some interest for lovers of antiquities, but is far from being geographically exact.)

TAMAN oua. [Art.-Extra, vol. ii., p. 65.]

TAMARICAeae, a small natural order, belonging to the syncarpous group of polypetalous Exogens. The species are either shrubs or herbs, having straight rod-like branches, with alternate entire leaves, resembling catkins; the flowers are in dense spikes or racemes. The calyx is 4-5-parted, persistent; the petals inserted into the calyx, both with imbricate estivation; stamens hypogynous, distinct or united, equal in number with the petals or twice as many; ovary superior, with a short style and 3 stigmas; fruit a capsule, 3-valved, 1-seeded, with numerous seeds, which are comose; embryo straight with an inferior radicle.
TAMARINDS

**Medical Properites.** Of the two varieties of the genus, the one described in the Old World, the fruit is much larger in size in the East Indian than the West Indian. The shell being removed, there remains the flat square hard seeds, imbedded in a pulp, with membranous fibres running through it. In the East Indies the pulp is dried, either in the sun, and this is used for home consumption, or with salt added, and dried in copper ovens, which is kind is sent to Europe. (Crawford’s Indian Archipelago.) This sort, called natural tamarinds, is much darker and drier than the West Indian, which are called prepared or tamarind. Tamarinds reach maturity in June, July, and August, when they are collected, and the shell being removed, they are put into jars, either with layers of sugar put between them, or boiling syrup poured over them. How long the jars remain in the boiling syrup, the tamarinds therefore contain much more saccharine matter than the others. According to Vaquelin, prepared tamarinds contain per cent. citric acid 9-40, tartaric acid 1-55, malic acid 9-45, bitartrate of potash 3-25, sugar 4-7, vegetable extract 34-53, purplish tincture 27-35. This prepared pulp has a pleasant acid astringent taste, with a somewhat vinous odour.

It presents an example of one of those natural combinations of elements, and particular properties which are of such great utility in hot climates. It is used not only in India, but in Africa, as a cooling article of food, and the travellers across the deserts carry it with them to quench their thirst. In Nubia it is allowed to stand in the sun till it has a kind of fermentation takes place: it is then formed into cakes, one of which dissolved in water forms a refreshing drink. In India a kind of sherbet is made with it, and by the addition of sugar it becomes a source whence vinegar is readily obtained. In the United States and British colonies, in the cures of the sun-fever and bilious fever, the greatest heat and dryness, which are so prominent as elements of these climates, it proves highly serviceable; in small quantity it acts as an astringent, but in larger it proves laxative. Boiling water poured over tamarinds yields a drink which is very grateful in the Indian climate, being the best substitute for the pure waters of the Mediterranean: it is also a native of the coasts of Cornwall, Hampshire, and Sussex, in England. Ehrenberg has described a great number of varieties of this species, one of which, the T. g. Mannheri, known by its glaucous powderly appearance, he says, produces the manna of Mount Sinai. This manna however does not contain any crystallizable mannites, but, according to Mitscherlich, consists of nothing more than a mucilaginous sugar. This is one of the species of this genus remarkably abundant in the large quantity of sulphate of soda which its ashes contain.

**T. Indica,** the Indian tamarisk, is a glabrous glaucous shrub, with minute acute leaves clasping the stem, with slender lateral spikes of flowers, five times longer than the calyx. It is a native of various districts in Europe. It is baked, and the ashes are employed in medicine by the native doctors of India. The same property also renders them valuable in dyeing. Other Indian species of the Tamarisk produce galls, which are used for the same purposes as those of **T. Indica**.

**T. Africana,** the African Tamarisk, is a glabrous glaucous shrub, with lanceolate imbricated leaves, with dense, scaly, simple, sessile racemes, with oval chaffy bracts, and a 3-valved capsule. This is a native of the sands of Sahara. The only species in the genus in Europe are Mediterranean, the one in North Africa, the Mauritana, around the Bay of Naples, in Egypt, and in the Levant. It has very much the appearance of **T. Gallica,** but its flowers are larger, and bark darker. Like T. Gallica, its ashes yield a large quantity of sulphate of soda. The bark is the chief source of the real tamarind, diuretic and astringent, and has been used in medicine as a tonic.

**T. Orientalis,** the Eastern Tamarisk, is a tree attaining a height of from 10 to 20 feet; it is glabrous all over, with slender lateral spikes of flowers, five times longer than the calyx, and with yellow petals, streaked with red: the filaments are compound, about an inch long, and there are three or four stamens. It is also a native of the tropical parts of Africa. It forms a handsome tree with spreading branches bearing leaves of a light colour and flowers with a straw-coloured calyx and yellow petals, streaked with red: the filaments are compound, and bear the anthers brown. The timber of this tree is very firm, hard, and heavy, and is applied to many useful purposes in building.

The second species is the **Tamarindus Occidentalis,** the West Indian Tamarind, which is distinguished from the other by possessing short legumes not more than three times longer than they are broad. It is a native of South America and the West India Islands, forming also a large spreading tree, with yellowish flowers streaked with red and purplish stamens.

These plants may be grown in this country, by sowing the seeds, which can be easily obtained, in a hot-bed, and when the young plants obtain a height of two or three inches, planting them out in separate pots. For the medical and dietetic properties of the tamarind see **TAMARINDS.**
deserving a prominent position in the shrubbery. The hardy species do not require much care in their cultivation. They will grow in almost any soil or situation, and may be propagated by cuttings planted out in the open ground either in the spring or autumn, when they readily strike root. Those requiring heat and protection thrive best in a soil composed of loam and peat, and may also be propagated by cuttings placed in sand under a bell jar.

TAMATIA, Cuvier’s name for the Puff-Birds.

Mr. Swainson, in addition to his description in the Zoological Illustrations, speaking of these birds in his Classification, says, that they sit for hours together on a dry, chaff-covered branch, from which they dart upon such insects as come sufficiently near. The Hermits (Monassa, Vieill.) have similar habits. [Barbets, vol. iii., p. 434; Kingfishers, vol. xiii., p. 227.]

TAMAIULAPAS. [MEXICAN STATES.]

The province of Great Russia, is situated between 51° 30' and 59° 30' N. lat., and between 39° 40' and 43° 40' E. long. The area is 24,200 square miles, and the population 1,600,000. It is bounded on the north by Nuschei-Novgorod, and for a very small distance on the north-west by the north-west steppes. It has been covered with forests; but the major part of the district, on the west by Riasan, Tula, and Orel (by the two last for a very small distance); and on the east by Penza.

This government is a uniform level country, without mountains or large rivers, which runs all over from the north to the south and is drained by a number of tributary streams. There are great forests and on the south extensive steppes. The soil in the northern half is sandy, marshy, and poor; in the southern part it mostly consists of loam or black mould, and is fertile and productive. The steppe stretches far into the country, and when they have been brought under cultivation, make good arable land; they are designated as steppes only because they are destitute of wood. The river Oka enters the government from Riasan, but passes only through one circle, where it is joined by the Mozhaisa, a large tributary, from which the Volga, one of the largest rivers of Russia, which has nothing remarkable in its position, has been much improved in its appearance since the beginning of this century. Almost all the houses are built of wood: the principal buildings are the monastery of Our Lady of Casan, in which there are two churches; seven temples, and six wooden churches, the gymnasium, and the civil hospital. There are a military school, founded and endowed by the nobility in 1602, a seminary for priests, and a district school.

The bishop resides in this city. The inhabitants manufacture shawls, kersey, sailcloth, cordage, and woollen cloth; and there is an Imperial alum and vitriol manufactory. The inhabitants carry on some trade, but their chief occupation is agriculture.

Tambow, the capital of the province, is situated nearly in the centre of the province, on the river Zna, in 52° 44' N. lat. and 41° 45' E. long. It is a large town, with 20,000 inhabitants, and was founded in 1630, as a bulwark against the Nogay Tartars. Scarcely any traces of the ancient fortifications now remain, but there is nothing remarkable in the position which has only been much improved in its appearance since the beginning of this century. Almost all the houses are built of wood: the principal buildings are the monastery of Our Lady of Casan, in which there are two churches; seven temples, and six wooden churches, the gymnasium, and the civil hospital. There is a military school, founded and endowed by the nobility in 1602, a seminary for priests, and a district school. The bishop resides in this city. The inhabitants manufacture shawls, kersey, sailcloth, cordage, and woollen cloth; and there is an Imperial alum and vitriol manufactory. The inhabitants carry on some trade, but their chief occupation is agriculture.

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Tambow, the capital of the province, is situated nearly in the centre of the province, on the river Zna, in 52° 44' N. lat. and 41° 45' E. long. It is a large town, with 20,000 inhabitants, and was founded in 1630, as a bulwark against the Nogay Tartars. Scarcely any traces of the ancient fortifications now remain, but there is nothing remarkable in the position which has only been much improved in its appearance since the beginning of this century. Almost all the houses are built of wood: the principal buildings are the monastery of Our Lady of Casan, in which there are two churches; seven temples, and six wooden churches, the gymnasium, and the civil hospital. There is a military school, founded and endowed by the nobility in 1602, a seminary for priests, and a district school. The bishop resides in this city. The inhabitants manufacture shawls, kersey, sailcloth, cordage, and woollen cloth; and there is an Imperial alum and vitriol manufactory. The inhabitants carry on some trade, but their chief occupation is agriculture.
made Professor Emeritus, with a pension. In 1797, when the French invaded Lombardy, Tamburini was obliged by the new government to resign active duties at Pavia, as professor of moral philosophy and of 'jus naturae,' an arduous tax in those times of confusion and instability. Tamburini boldly fulfilled his duties, and effected some good by proclaiming wholesome principles from his chair. Shortly afterwards his chair was suppressed, but he was appointed rector of the lyceum of his native town, Brescia. When that office was assumed by government in Rome and North Italy, Tamburini was sent again to Pavia as professor of moral philosophy and of 'jus naturae et gentium,' in which chair he continued for fifteen years, till some years after the Restoration, when the emperor found it expedient himself to make him a member of the council of the faculty of law and politics in the university of Pavia. Tamburini was also a knight of the order of the Iron Crown. He died at Pavia, in March, 1827, at ninety years of age; a few days after the death of his brother professor, Volta. His remains were buried with the greatest honours, being followed to the grave by the whole of the professors and above six hundred students, with marks of sincere respect and deep regret.

The work for which Tamburini is mostly known is 'Idea della Santa Sede,' published anonymously at Pavia, in 1784. An extract from the author's preface will convey some idea of the nature of this work: 'It is easy to say in what the most distinctive and happy expressions a vague and indeterminate meaning is attributed. A word was originally fixed upon to signify a certain thing. The idea of it was perhaps clear and precise in its origin, but as in the course of time the idea itself has changed, the meaning has been so altered that people attach to it different meanings. Hence obscurity and confusion and interminable disputes arise, and still the sense of the disputed word is kept up, without conveying any distinct idea of what it means. Numbers of examples might be quoted of such an occurrence. For instance, in our own times everybody speaks of the Holy See, the Apostolic See, the chair of St. Peter, the Roman church, which are so many expressions signifying the same thing, and which in ancient times expressed a simple and clear idea, but which now convey to the minds of people the most vague and indeterminate notions. Things the most disparate are identified; people confound one subject with another, the see with the incumbent, the church with the court of Rome, the court with the church; and from this medley arises a confusion of ideas through which every decree that proceeds from Rome becomes invested with the most respectable authority of the chair of St. Peter. The Apostolic See, of St. Peter, of the church of Rome is a confusion followed by the most pernicious consequences not only to local churches, but also to the universal church, and to the Apostolic See itself. In order to support certain decreals which emanated from Rome, some shortsighted theologians have attributed to the Roman See new prerogatives unknown to the earlier ages of the church, and they have had recourse to a supposed infallibility. ... Other men have contested these prerogatives, and in the warmth of the controversy the real claims of the Holy See have been overlooked and forgotten. ... One party has maintained that, on the plea of infallibility, every decision emanating from Rome ought to be received with blind obedience, whilst the other party has imagined that by the same privilege the infallibility ascribed to it might be boldly denied. ... Both these extremes proceed from the want of just and exact notions on the nature, the character, and the properties of the Holy See. The present work is intended to establish these notions, which little French historian could not, by my humble book, entitled 'Disquisition Canonique et Historique sur l'Autorité du Saint Siège, et les Décrets qu'on lui attribue.' In the first part the author has well explained the idea of the Holy See, its Constitution; in the second part he has maintained the primacy of that see. I have adopted the most important principles of this little work, compressing or enlarging its various parts, and fitting the whole to the wants of our times and country. I have endeavoured to give the essence and substance of the primacy of the Roman see, and have given some general rules in order to calculate the value and merit of the Roman decreals, and to make our own conduct prac
tically harmonize with the obedience which we owe to the authority of the see of Rome.' At the appearance of Tamburini's work it was stigmatized as Jansenistical, although the author has not gone so far as some of the French Jansenists, or as Bishop Ricci and his synod of Pistoia. [Jansenovii: Plus VI.] The reasoning is closely argumentative, and supported by numerous references. Several refutations of it were published at Rome and other towns of Italy. The second edition was published in 1797, the third at Rome, in 1800. It is entirely in the style of the 'Lezioni di Filosofia Morale e di Naturale Sociale,' 4 vol., Pavia, 1800-12; 3, 'Elementa Juris Naturalis,' Milan, 1815; 4, 'Cenni sulla Perfezilità dell'Umana Famiglia,' Milan; 5, 'Saggio di una teoria sistematica di idee.' 2nd ed. A few of the most indefinite perfectibility and universal happiness in human societies. The philosophy of Tamburini is of the Euclectic kind.

(Defendente Sacchi, Varietä Letterarie, vol. i., Mafra, Storia della Letteratura Italiana, b. vi., ch. 13; Antologia di Firenze, Nov. 39, 76.)

TAME. River. [Staffordshire.]
TAMER. River. [Cornwall.]
TAMIS. Broads. (Timur.)
TAMIA. (Squillere, vol. xii., pp. 398, 399, &c.)
TAMMEAMA. (Sandwich Islands.)
TAMPICO. [Mexican States.]
TAMUL. [Hindustan, p. 228.]
Rhedsheda the mound on which the present ruins of the
castle stand, but the ruins themselves are of later date.
An old ditch, yet visible, called 'the king's dyke,' which
surrounds the town on three sides, is supposed by Shaw to
be of yet greater antiquity than the time of Edward.
In the Saxon 'Chronicle' the town is called Tamweorthe,
Tamweorthe, Tamanwarwe, or Tamwarwe : in other
antient writings the orthography is still further varied.
The name Tamwarwe, of the Aksestarians is supposed to
be the 'bun gennes' (burgesses) of Tamworth, are mentioned in that
record, in the notice of other places.
After the Conquest, the castle and adjacent territory was
the domain of the Dukes of Normandy; and afterwards, on the extinction
of the male line of his family in the time of Edward I.,
passed to the family of Freville. The castle now belongs to
Marquis Townshend. Sir Walter Scott has enumerated
'Tamworth tower and town' among the possessions of his
feititious Marmon : but the family had become extinct
long before, as observed by Sir Walter in the Appendix to his
poem.

The town stands on the north bank of the river Tame
and Anker, just at their junction, and consists of several
streets not very regularly laid out. The streets are paved,
but had not been lighted when the Municipal Boundary
Commissioners' Report was drawn up (Part I. Papers for
Report on Municipal Bounds). The town is supplied with
water from two sources, and has a curious double staircase,
one from the inside and one from without, each communicating with a
different set of floors in the tower.' (Rickman's Gothic Architecture.)

The remains of the castle are on a mound close to the Tame :
they are of various periods, and some modern buildings
have been added to adapt the whole to the purposes of a
modern residence: the castle commands a fine prospect.
There are some Dissenting places of worship: an alms-
house, small almshouses, and a school for poor children;
Southwark: a town-hall, with a small and inconvenient
zool beneath: and two bridges, one over the Tame, the
other over the Anker.

The population of the municipal borough in 1831 was
3257 (of the whole parish (containing several hamlets and
townships) 7192. Some manufactures are carried on;
but the whole number of men employed in them in the
parish was, in 1831, only 38. Some coal and brick-earth
are dug in the neighbourhood, and bricks and tiles are
made. The market day is Saturday: there are several regu-
lar fairs for cattle and merchandise, and several new fairs
for cattle only: some of them held at Fazeley in the
parish. The Coventry Canal passes near the town.

Tamworth is a market town, but the town having declined and ceased to be regarded as a corporation, was incorporated anew by letters patent of
Queen Elizabeth: the governing charter is one of Charles II.
By the Municipal Reform Act the borough has four
demennen, and twelve councillors, but is not to have a
commission of the peace except on petition and grant.
The criminal jurisdiction of the corporation had fallen into
dissuse before the passing of that act, as well as the
court of record : quarter-sessions were held, but for civil
processe only.

Tamworth first sent members to parliament in the reign
of Elizabeth: it still returns two members. The number of
voters on the register in 1833-5 was 531 : in 1839-40, 490.

The living of Tamworth is a perpetual curacy, of the clear
yearly value of 170l., with a glebe-house. There are in
the parish the perpetual curacies of Fazeley, Wigginton,
and Wilnecote, of the clear yearly value of 230l. (with
the manor of Littlemill). The curate of Fazeley presents to Wigginton and Wilnecote. There
are also in the parish two chapelles, Amington and Hopwas.

There were in the borough, in 1833, three endowed and
three unendowed day-schools, with 183 children, namely
142 boys, 21 girls, and 20 children of sex not stated; and
three Sunday-schools, with 233 children, viz. 97 boys and
106 girls. In the rest of the parish were one infant-school,
partly supported by subscription, with 88 children, namely
41 boys and 47 girls; ten day-schools of all kinds, with 96
boys, 80 girls, and 80 children of sex not stated, making
256 children in all; and three Sunday-schools, with 288
children, namely 150 boys and 138 girls. (Shaw's Staffordhire: Parliamentary Papers.)

TANA-ELF. (Trondheim.)

TANACETUM, a genus of plants belonging to the
natural order Composite, and the suborder Corymbiferae.
It has a very large number of species, and is distributed
over the temperate and sub-tropical regions of both
hemispheres. The receptacle is naked; the flowers of
the ray are 3-toothed, those of the disk 5-toothed, tubular,
and hermaphrodite. The fruit, an achenium, is crowned with
a membranous margin, or pappus. The flowers are yellow.

The most common species is the Tanacetum vulgare,
common Tansy. It has bipinnatifid leaves, with serrated
sections or laciniae. This plant is abundant in Great
Britain and throughout Europe, on the borders of fields
and road-sides. It possesses in a high degree the bitterness
of the whole order Composite, which, in the section
Corymbiferae, is combined with a resinous principle. It
is recommended and has been extensively used in medicine
as an emmenagogue and anthelmintic. Although the
flavour and smell of this plant are both at first dis-
agreeable, a taste for it may be acquired, and it has been
used in cookery for the purpose of flavouring puddings and
desserts. It has been used as a colouring-matter, and is
used by the Finlanders for the purpose of dyeing their
cloths of that colour. It is said that if meat be rubbed with the fresh leaves, it will not be attacked by
the fly.

TANGERS. The genus Tanagra of Linnaeus stands,
in the 12th edition of the Systema Naturae, between
Embergera and Fringilla, in the order Passeres.

Cuvier characterises the genus as having a conical bill,
triangular at its base, slightly arched at its arite, and
notched towards the end: white and brownish-black. He
observes that they resemble our sparrows in their habits,
and seek for seeds as well as berries and insects. The
greater part, he remarks, force themselves upon the attention of the
Observant natural collector of ornithological objects by their vivid
colours. He places the genus between the Drongos (Elo-
litus, Cuv.) and the Thrushes (Turdus, Linn.), thus subdi-
viding it—

1. The Euphonia or Bullfinch Tanagers (Euphones,
on Tanagaras Boreuirs).

These have a short bill, presenting, when it is seen
eritically, an enlargement on each side of its base : tail short
in proportion.

Examples, Tanagra violacea, Cayennensis, &c.

2. The Grosbeak Tanagers.

Bill conic, stout, convex, as wide as it is high; the
back of the upper mandible rounded.

Examples, Tanagra magna, atra, &c.

3. The Bow-winged Tanagers.

Bill conic, shorter than the head, as wide as it is high,
the upper mandible arched and rather pointed.

Examples, Tanagra Tulae, tricolor, &c.

4. Oriole Tanagers (Tanagaras Lioti).

Bill conic, arched, pointed, notched at the end.

Examples, Tanagra gularis, piletata, &c.


Bill conic, a little convex, with an obtuse projecting
tooth on the side.

Examples, Tanagra cristata, brunnea, &c.

6. Ramphocelus Tanagers.

Bill conic, with the branches of the lower mandible
convex, backwards.

Examples, Tanagra Jacopa, Brasilia, &c.

The views of Mr. Vigors on the subject of this group
will be found in the article Fringilla.

Mr. Swainson remarks that the Tanagrina, or Tanagers,
form that group which is probably the most numerous, as
certainly is the most comprehensive family of the
comprehensive family of the Fringillidae. As the dentirostral
division of that family, it is, he observes, typically distin-
guished from all the others by the bill having a distinct
and well-defined notch at the end of the upper mandible,
the ridge or culmen of which is much more curved than
the gony; or, in other words, the culmen is more curved
downswards than the gony is upwards: this inequality, he
further states, as in the genus Poecus, very much takes off
from that regular conic form of bill so highly characteristic.
of the greater number of the finches; so that the combination of these two characters is, he thinks, perhaps the best distinction of the whole group. And if this peculiarity adds itself to another one which exists in all, and which serves as some sort of a signet to separate them from birds, the largest being intermediate between a sparrow and a thrush, while the majority do not exceed the size of a linnet; some few are even smaller. It is quite evident, from the great strength of bill possessed by some, and notably by those birds which are so abundant in all, and which these birds feed upon seeds and creeping insects picked from the branches of trees, for very few of them are ever seen upon the ground. Their colours in general are bright; and, in a large number, particularly rich and beautiful. The little birds forming the genus Aglaia, in fact, are ornamented with the most vivid hues or glossed with rich reflections of gold, rendering them inferior only to the Humming Birds. Some possess considerable vocal powers; and the notes of the subgenus Euphonia, as its name implies, are said to be particularly musical. The impossibility however of providing the Tanagers with their native sweet food has prevented them from ever being brought alive to the European menagersies, to which their beauty would render them the greatest ornaments.

Mr. Swainson then dwells on the obscurity which attends the examination of this group, which he states to be one of the most difficult to be understood in the whole class. He points out, however, that a comparative strength of the bill is a variable in the same subgenus, that such variation, indicative of genera in other families, is in this no more than a discrimination of sections or species. Nothing, according to him, can illustrate this fact more than the affinity between Pipilo and Tardirostra. Looking to the types of each, he observes, we should say that they did not belong even to the same subfamily; for the bill of the first is nearly as large as in the finches (Fringillinae), while that of the latter is comparatively slender that it seems more akin to the Larks than to the Tanagers; and yet, he remarks in continuation, between these two extremes or types, he had, when he wrote, before him such a perfect series of gradated forms, wherein not only the bill, but all the other subordinate characters of the two groups, progress in such a perpetual and almost imperceptible manner, that he was actually at a loss to know where Tardirostra ends and Pipilo begins. The foregoing affinity being admitted, and it should be added that some of the most eminent natural writers have placed it a genus in a totally different family, Mr. Swainson next proceeds to inquire into the cause of so remarkable a variation in the bill of such closely- related forms, and states that the whole of these seed-eating birds of Tropical America are composed of the Tanagers, which, in those regions, supply the place of the other finches so abundant in all parts of Europe. The innumerable small and hard fruits produced in the American forests are, he observes, the appointed food of the Tanagers, the parrots living principally upon the larger nuts, and the bill of the former birds is constructed accordingly. After noticing the disparity of the bills in the finches, taking the common linnet and the hawfinch for example, he remarks how little reliance can be placed on such diversity in determining genera; but this, he observes, will not explain the great difference which often exists in the size and plumage of species which all writers agree in arranging within the limits of the same subgenus; and he takes the restricted genus Pipilo, Cuv., as an example. Some of the species of that genus are green, some black, others grey; and in size they vary from the dimensions of a sparrow to those of a small wood pigeon.

The doubts which, in Mr. Swainson's opinion, hang over the correctness of the views which he entertained with respect to the natural affinities of these birds, may, he says, be said to hinge almost entirely upon his not having been able to examine a number of specimens of Pipilo, and certain peculiarities which lead him to expect that it forms the type of one of the principal divisions among the Tanagers, or that it connects his genus Aglaia with Pipilo. On the 30th of April, 1840, according to Mr. Swainson, constitute the passage from the true sparrows (Pyrrhula) to the subgenus Tanagra proper; while by the second, Pipilo would stand intermediate between Aglaia and Tanagra, and thus constitute the narial genus of the subfamily; and this subgenus would, he says, be the natural one. He considers that the two typical groups or genera are Tanagra and Phaoniasema; while those which he thinks aberrant are Nemoria, Aglaia, and Pipilo. It was only between the two genera of the latter that the affinity sufficiently strong to justify the belief that these five genera form a circle more or less complete; the difficulty being how to connect Aglaia with Pipilo. He then takes a review of the genera, for which he refers our readers to the work entitled, in the Synopsis at the end of the volume, makes the Tanagrine, which he places between the Cocothraustine and the Fringilline, consist of the following genera and subgenera, all of which he characterizes:—

Subfamily Character.—Bill equally conic; the upper mandible more or less arched, and very distinctly notched. Feet formed for perching. Claws broad and fully curved.

**Turdicolae.**

**Tanagra** (with the subgenus Pitylus. Tanagra, and Ramphele). Phaoniasema (with the subgenera Phaoniasema, Tychophonous, and Leucopogia). Nemoria, Aglaia (with the subgenera Euphonia and Tanagrella). And Pipilo (with the subgenus Aremon). (Classification of Birds.)

The Prince of Canino (Birds of Europe and North America) places the Tanagrine between the Fringilline and the Emberizine. Pyragis is the only genus recorded and belongs to the Emberizine. Mr. G. R. Gray makes the Tanagrine the third subfamily of the Fringilline, arranging it between the Cochoastantine and the Fringillinae. The following genera are enumerated by Mr. Gray as belonging to the third subfamily:—


Mr. Gray, with his usual industry, gives the numerous synonyms of each genus. (List of the Genera of Birds, 2nd edition, 1841.)

We select Nuttall's description of the Scarlet Tanager, or Black-tinged Summer Red-Bird, Tanagra rubra, Linn. (subgenus Pyragis).

The male, he says, is entirely scarlet, with the wings and notched tail black: the base of the plumage is ash, then white. The female, young, and male in autumn, are dull green, inclining to yellow in the latter; yellow beneath: wings and tail dull brown about six inches and a half; star extent ten inches and a half.

'This splendid and transient resident,' says Nuttall, 'accompanying fine weather in all his wanderings, arrives from his winter station in tropical America from the beginning of the middle of May, and extends his migration probably to Nova Scotia as well as Canada. With the shy, unsocial, and suspicious habits of his gaudy fraternity, he takes up his abode in the deepest recesses of the forest, where, firmly flitting from observation, he darts from tree to tree like a flashing meteor. A gauzyophile, conscious of his brilliance, and the exposure to which it subjects him, he seems to avoid remark, and is only solicitous to be known to his humble mate, and hid from all beside. He therefore rarely approaches the habitations of mankind, unless perhaps the skirts of the orchard, where he sometimes however builds his nest, and takes a taste of the early and inviting, though forbidden berries.'

Among the thick foliage of the tree in which he seeks support, he is often, from the branches, at times, we hear his almost monotonous tshup-witer, tshup-ide, or tshuk-kade, tshuk-kade, repeated at short intervals, and in a pensive under-tone, heightened by the solitude in which he delights to sit;—then, when the same note is also repeated by the female when the retreat of herself and young is approached; and the male occasionally utters, in recognition to his mate, as they perambulate the branches, a low whispering 'tuit, in a tone of caution and tenderness. But besides these calls on the female, he has also, during the period of his incubation, and for a considerable time after,
TANCRED, son of Eudes, a Norman baron, and of Emma, sister of Robert Wiskard, duke of Apulia, according to some (Guillaume d'Arc, Histoire des Conquêtes des Normands en Italie, en Sicile, et en Grèce.).

TANCRÉD, a more musical strain, resembling somewhat, in the mellowness of its tones, the song of the fiddling Baltimore. The syllables to which I have hearkened appear like ‘tacheeco ‘wait ‘wait, ‘rebhœ de ‘wait, and ‘wait, ‘rebhœ de ‘wait, with other additions of her beauty, for which no words are adequate. This pleasing and highly musical meandering ditty is delivered for hours, in a contemplative mood, in the same tree with his busy consort. If surprised, they fit together, but soon return to their favourite station in the spring, and succeed in bringing up a new brood. The song has some resemblance to that of the Red-eyed Vireo in its compass and strain, though much superior, the ‘wait ‘wait being whistled very sweetly in several tones, and with emphasis; so that, upon the whole, our Pyrranga may be compared to Apulia and Calabria; for the latter can be far more harmless to the farmer, brilliant in plumage, and unaggressive in voice."

*Nest, Food, &c.*—The same author describes the nest (which is built about the middle of May, on the horizontal branch of some shabby forest-tree, commonly an oak, but sometimes in an orchard tree) as being slightly put together, and usually framed of broken rigid stalks of dried weeds or slender first-twigs, loosely interlaced together, and partly lined and concealed with hemp (Apium), some slender grass-leaves, and pes-vene runners (Amphicarpa), or other frail materials; the interior being sometimes lined with the slender, wiry, brown stalks of the Cardinal cissus (Cissus Antirrhina), or with slender pine-leaves; the whole so thinly packed as to allow of the light through the interstices. The three or four eggs are dull blue, spotted with two or three shades of brown or purple, most numerous towards the larger end. As soon as their single brood, which is seldom or early in July, is their natural enemies, they leave for the south, generally about the middle of end of August."

'The female,' says this interesting author in continuation, "shows great solicitude for the safety of her only brood; and, on an approach to the nest, appears to be in great distress."

When they are released from her more immediate protection, the male, at first cautious and distant, now attends and feeds them with activity, being altogether indifferent to that concealment which his gaudy dress lent his nature in July; and, as it attaches to his more interesting brood, is the Scarlet Tanager, that he has been known, at all hazards, to follow for half a mile one of his young, submitting to feed attentively through the bars of a cage, and, with a devotion which despair could not damp, roost by it in the branches of the same tree with its prison."

The food of this species consists mostly of winged insects, such as wasps, hornets, and wild bees, the smaller kind of beetles, and other Coleoptera. Seeds are supposed to be sometimes received by it, and they are very fond of whortle and other berries.

It is in August that the moult of the male, when he exchanges his nuptial scarlet for the greenish-yellow livery of the female. (Manual of the Ornithology of the United States and of Canada.)

TANAGRINE. [Tanagers.] TANAI. [Don.] TANARO. [Po.]

TANCRED, of Hauteville in Normandy, was a feudal baron who lived in the latter part of the tenth and beginning of the eleventh century. After doing military service for some years under Richard the Good, duke of Normandy, he retired to his hereditary mansion, where he lived in peace and friendship with his numerous sons and three daughters. All his sons were remarkable for their comeliness, their great strength, and their courage. The eldest, Serlon, followed William the Bastard in his conquest of England, and the others went successively to seek their fortune in Apulia, where Rainulf, another Norman adventurer, had already obtained the countship of Avena from Sergius, duke of Naples. William, one of Tancred's sons, called 'Fier à brás,' or strong of arm, became count in the county of Sicily, after the death, by murder, of his father; he was called Wiskard, or the wise, became duke of Apulia and Calabria, and the founder of the Norman dynasty of Sicily. (Stokes, Two, History of.) Their father Tancred died at a very great age at Hauteville. Traces of the château of Tancréd, belonging to old popular tradition, were still seen a few years since in a pretty valley near Hauteville, four miles north of the town of Marigny, in the arrondissement of Coutances department of La Manche. (Gautier d'Arc, Histoire des Conquêtes des Normands en Italie, en Sicile, et en Grèce.)

TANCRED, lord of Sicily. (Stokes, Two, History of.)

TANGENT. When a straight line only, on which is constructed the tangent, commences with the given point (B) of the curve (A) at a given point, and descends without changing its direction to the given point (A) of the curve (A): meaning that no curve of the given species can pass through the given point, so as to pass between (B) and (A), immediately after leaving the point at which the two latter intersect.

To ascertain the degree of contact of two curves which meet in a point, proceed as follows. Let y = φx and y = ϕx be the equations of the curves, and a the abscissa at the point of contact; so that φa = ϕa. At the point whose abscissa is a + h, the difference of the ordinates of the curves is, by Taylor's theorem,

\[ (φ(a + h) - ϕ(a + h)) = \frac{(φ'(a + h) - ϕ'(a + h))h}{2!} + \frac{(φ''(a + h) - ϕ''(a + h))h^2}{3!} + \cdots \]

or

\[ (φ(a + h) - ϕ(a + h)) = \frac{(φ'(a) - ϕ'(a))h}{2!} + \frac{(φ''(a) - ϕ''(a))h^2}{3!} + \cdots \]

as to which, generally speaking, it will be found that h can be taken so small that the series shall be convergent: if this be not so, the method of arranging the series given in Taylor's Theorem must be employed. Now of two series of the form A^n + B^n + \cdots, the value of that in which m is the greater will diminish without limit as compared with the other, when m diminishes without limit. Consequently, every curve y = φx, which has ϕa = φa, will approach, before the point of contact is attained, nearer to y = ϕx than any other in which ϕa is not = ϕa. Again, when ϕa = ϕa, those cases of y = ϕx in which ϕa = ϕa, will approach nearer to y = ϕx than any in which ϕa is not = ϕa; and, generally speaking, the closest possible contact with y = ϕx when x = a:—give such values to the constants in y = ϕx as will satisfy as many as possible of the equations φa = ϕa, φa = ϕa, φa = ϕa, &c., successively from the first, by which of sketch, which can be filled up from any elementary work; and the following are the principal results:

1. When the string of equations is satisfied up to \( \phi(a) = \psi(a) \), the contact is said to be of the nth order.
2. In contact of the nth order, the deflection \( (φ(a + h) - ϕ(a + h)) \) diminishes with \( A^n \), and vanishes in a finite ratio to it.
3. In contact of an even order, the curves intersect at the point of contact; in contact of an odd order, they do not intersect at that point.
4. When curves have a contact of the nth order, no curve, having with either a contact of an order inferior to that at the same point, can pass between the two curves.
5. A straight line, generally speaking, can only have a contact of the first order with a curve; and the equation to the tangent straight line of the curve y = φx, when x = a, is \( y = \phi(a) + ϕ'(a)(x - a) \). But if it should happen that \( ϕ'(a) = 0, ϕ''(a) = 0, \cdots, \phi(a) = 0 \), then for that point the tangent has a contact of the nth order. Thus, at a point of contact with the tangent has a contact of the second order, at least, with the curve.
6. A circle, generally speaking, can be made to have a contact of the second order with a curve, and the equation
of the most tangent circle, or circle of curvature, to the
curve \( y = \phi(x) \), at the point \( x = a \), is

\[
\left( x - a + \frac{\phi''}{\phi'^2}(1 + \frac{\phi''}{\phi'^2})^2 \right) + \frac{y' - \phi'}{\phi'^2} = \frac{1 + \frac{\phi''}{\phi'^2}}{\phi'^4}
\]

This circle cuts the curve, generally speaking: if not, as
for example, at the vertices of an ellipse, it is evident
that the circle has a contact of some higher and odd order.
The centre of the circle of curvature is at a point on
the normal, being that at which the normal touches the
ellipse. \[ \text{[Involutes and Evolutes]} \]

Not only is the term tangent most generally applied to
the closest straight line only, but frequently only to that
portion of the straight line which falls between the point
of contact and the axis of \( x \). Again, the normal is a
straight line perpendicular to the tangent, drawn through
the point of contact: but this term also is frequently ap-
piled only to that portion which falls between the point
of contact and the axis of \( x \). It is with reference to
this limitation that the terms subtangent and subnormal are
to be understood: the first meaning the distance from
the foot of the tangent to the foot of the ordinate; the second
that from the foot of the ordinate to that of the normal.
The formula for the subtangent is \( \phi - \phi' \); that for the
subnormal \( \phi \times \phi'' \).

Let \( \beta \) be the angle made by the tangent with the axis
of \( x \); usually the angle made by that part of the tangent
which has positive on the positive side of the
axis of \( x \). Then \( \beta \), at the point whose abscissa is \( x \), is
determined by the equation

\[
\tan \beta = \frac{dy}{dx}; \quad \text{and subtangent} = \frac{dx}{dy}, \quad \text{subnormal} = \frac{dy}{dx^2}.
\]

If we take the more general mode of measurement pro-
posed in Snell, this equation remains equally true. Now,
keeping strictly to that mode, let \( \beta \) be the angle made by
the tangent with the axis of \( x \); \( \theta \) the angle made by the
radius vector \( r \) with the axis of \( x \), and \( \varphi \) that made by
the tangent with the radius vector. It will be found, then, that
in all cases

\[
\mu = \beta - \theta, \quad \tan \mu = \frac{r' \phi'}{d^2r},
\]

Unless the mode of attributing signs be carefully at-
tended to, these last equations, though always considered
as universally true, are not so in reality.

We now come to the consideration of a surface. The
mode of defining contact of a given order resembles that
adopted with reference to a curve. Thus if \( z = \phi(x, y) \)
and \( x = \psi(x, y) \) be the equations of two surfaces coinci-
ding when \( x = a, y = b \), so that \( \phi(a, b) = \psi(a, b) \), then if
the point be taken at which \( z = a + h, y = b + k \), the con-
tact of the two surfaces is of the nth order, when the de-
fection

\[
\phi(a+h, b+k) - \phi(a, b) = \psi(a+h, b+k) - \psi(a, b)
\]

being developed in powers of \( h \) and \( k \) by Taylor's Theo-
rem, shows no terms lower than those of the form

\[
A^h + B^k + \ldots + M^n.
\]

This is tantamount to the following: two surfaces have a
contact of the nth order when any plane whatever drawn through
the point of contact cuts the surfaces in two curves which have a
contact of that order.

Every surface has at every point a plane which has a
complete contact of the first order. If \( z = \psi(x, y) \), and
\( x, y, z \) be the co-ordinates of the point of contact, and
\( \xi, \eta, \zeta \) those of any point in the tangent plane, then the
equation of the tangent plane is

\[
\xi - x = \frac{dz}{dy}(\xi - x) + \frac{dx}{dy}(\eta - y), \quad \zeta - z = 0.
\]

But if the equation be given in the form \( \phi(x, y, z) = 0 \), it
is

\[
\frac{dx}{dy}(\xi - x) + \frac{dy}{dz}(\eta - y) + \frac{dz}{dx}(\zeta - z) = 0.
\]

In the first case, the equations of the normal, a line
drawn through the point of contact perpendicular to the
tangent, are

\[
\xi - x = \frac{dz}{dy}(\xi - x) + \frac{dx}{dy}(\eta - y), \quad \zeta - z = 0.
\]

In the latter case, they are

\[
\frac{dx}{dy}(\xi - x) + \frac{dy}{dz}(\eta - y) + \frac{dz}{dx}(\zeta - z) = 0.
\]
Tan

make a tangent plane horizontal, there is absolutely no
descent in one direction, or, by going along the tangent
plane, we can remain entirely on the surface, in one cer-
tain direction, as before observed. And the direction of
most rapid descent is at right angles to this direction of
no descent.

To put a case of the third kind, suppose a saddle placed
on a horse, and we take the lowest point of the seat.
The tangent plane then cuts through the saddle horizontally.
In the case of Tann-ho and Tangle, two directions are
two directions in which there is, comparatively speaking,
either ascent nor descent. The direction of most rapid
ascent, which is from the lowest point of the seat directly
towards the head or tail of the animal, is at right angles
to the direction of the greatest descent. In short, com-
paring, the vertical curves of the sections are some-
times positive, and sometimes negative, and the direction
of the greatest negative (or algebraically least) curvature
is at right angles to the direction of the greatest positive
(or algebraically greatest) curvature.

As to points connected with the apparent physical char-
acter of the tangent, which have been in various places
referred to in this article, it will be more convenient to con-
side the entire subject under the general term of TANGH/NIA, the name of a genus of plants belonging to
the natural order Apocynacese. This name was given
by Aubert du Petit Thouars to the plant which produces
the celebrated Tangelh poison of Madagascar. The genus
possesses several species, the most remarkable of which
are Euphorbia corollis, with a clavate tube, and 5-toothed
throat: the anthers are subsessile; the fruit is a drupe,
with a fibrous ligneous putamen or stone, which
contains one or two seeds. The specific name T. venen-
fors was given to the plant which yields the poison. It
has red or brown shoot, and paniculate terminal
flowers. At the time du Petit Thouars described this
plant, he stated that it was closely allied to the Cerbera
Manchas; and since its cultivation by Mr. Telfair in the
Mauritius, there can be no doubt of its belonging to the
genus Cerbera, and the plant is now called C. Tanghin.
In its native island this plant attains the size of a tree,
and has a hard wood which may be used for many kinds
of carpentry. But the part which yields the poison is the
kernel of the fruit. Although this kernel is small, not
much larger than an almond, Mr. Telfair says that it con-
tains enough poison to kill twenty persons. Its great use
in Madagascar was as a means of trial, the innocent being
supposed able to resist its action, whilst the guilty suffered
under its influence. Radama, the late king of Madagascar,
was desirous of abolishing its use, but found great diffi-
culty in doing so on account of the prejudices of the na-
tives. Mr. Telfair witnessed a sad instance of its use.
The king of Madagascar, on learning that he had inflicted
a serious wound on his brother, the prince of the blood
of mercury; but this medicine affected his mouth, so that
the impression produced upon his 'skid,' or physician, was
that the king had been poisoned. He therefore insisted
that the Tanghin should be administered, but to all the
servants of the household, in order to ascertain the guilty
party. The king protested against the procedure,
but in vain. The whole household were shut up during
the night without food, and in the morning were brought
out for trial. The provoking 'skid,' or physician, then
pounded the Tanghin bean to a pulp between two stones,
and applied a small quantity to the back of the tongue of
each individual. The effects varied in different individ-
uals. In some it produced vomiting, and the poison
began by being expelled. In others, they recovered,
and in others convulsions were brought on with violent efforts at
vomiting, which soon destroyed life. (Botanical Magazine, vol.
208.)

Tangh. [Maraboco.]

Tangle. [Sika-ke's.] Tangut is the historical name of a country in Asia,
which occupies the centre of the eastern, more extensive, and
more elevated table-land of that continent (Asia, vol. a.,
pl. 49), the western boundary of which originally extended to
the river Yen-tse, and was called Tang, founded an empire in the seventh
century, which was very powerful for a long time, and was
overthrown by Genghis Khan in 1227. The country still
goes by the name of Tangut, though it is now represented in
China under the name of Kansu, whilst another is mostly in possession of two Mongol nations,
the Oldh Tahoros and the Torbod Mongols.

Tangut borders on China Proper on the north-west, ex-
tending between 39° and 42° N. lat., and between 94° and
107° E. long. To the south of it is Tibet; to the west Chinese
Turkestan, or the government of Tian-Shan Naszul; and to the north Mongolia, of which also a portion is
included within the lately erected province of Kansu. As the
boundary-lines of the country are not politically deter-
minded, it is not possible to give an exact
The southern portion of Tangut, or that which lies south of 36° N. lat., is one of the most mountainous tracts on
the globe, and extends over the upper course of the river
Hoang-ho, to the north of the range of Khoookho-nor.
Along its southern border there is a very elevated range
which divides the upper courses of the rivers Hoang-ho
and Yan-tse-kiang, and is called the Bayan Khara range.
[BAYAN KHALA MOUNTAINS.] Another elevated range
which diverges in the same direction, but is situated
west near 38° N. lat. This range rises at a short distance
from the banks of the Hoang-ho north of the town of Lan-
tchou, and in its eastern part is called Kilian Shan; but
further north it takes the name of Nan Shan (or Southern
Chain). It rises to a great elevation, especially towards the
west, where many of their summits are covered with snow
and united by extensive glaciers. This mountain-chain is sup-
posed to be connected with the Kuensla range near 92° E.

These two mountain-ranges, which are the most great
portion of the country between 33° and 38° N. lat., and near
ly the whole of the remainder of the country is filled up by
a third range, which connects these two ranges, and extends
from south-east to north-west, being on the north united
to the Tarim, and on the south to the Bayan Khara Shan.
This chain bears the name of Siyu Shan, or Snowy
range, on account of the numerous summits which rise
above the snow-line. The river Hoang-ho breaks through
this range, but the huge rocky masses compel the river
to make a great bend towards the west between 34° and
36° N. lat., and the circuit which the river makes shows
the immense extent of these masses of rock. In this part
of its course the river is said to be hemmed in by lofty moun-
tains, and its banks can be established along the
banks. Its course above this bend is very imper-
fectly known, and the fabulous accounts of its sources show
that they have never been visited even by Chinese geo-
ographers.
The river enters a wide valley by a narrow gorge formed by the very many rocks above the town of Ho-chou (36° N. lat. and 102° E. long.). At the opening of this gorge is a fortress, called
Tsi-shy-kwan.

Tangut is separated from China Proper by a fourth
range, the mountains of Sifan, which run south and north,
being connected at their southern extremity with the
Bayan Khara Mountains and the Siyu Shan by an exten-
sive mountain-knot, which is in the country formerly called
the Tso-kyun, and is obtained by this line: this range is less elevated than the Siyu Shan, it rises in
several places above the snow-line, and occupies a con-
siderable width. It is supposed to terminate near the
banks of the Hoang-ho, at a distance of 100 miles.

Opposite to it and on the northern banks of the river rises
another chain, which may be considered as the continua-
tion of the mountains of Sifan; but this range, which
continues along the western bank of the river as far north as
42° N. lat., rises only to a moderate elevation, and is
stated to occupy in many places only three or four miles
in width: it is called Holang Shan, and slopes on the
west down into the steppe of the Oloti Tshoros. This
range is distinguished from all the others of Tangut by
being thickly wooded on its eastern declivity.

Only a small portion of the countries enclosed by these
mountain masses is fit for cultivation. It does not appear
that there is any cultivation in the upper valley of the
Hoang-ho above the forest belt of Tsy-shy-kuan. Below
this place and as far as Lan-tchou, the valley is wider, and
narrow tracts along the banks of the river are cultivated
and fertile. This part of the valley is compared with that
of the Adige in Russia. In the neighbourhood of Ning-hia, a town built on the western
banks of the Hoang-ho, at the eastern declivity of the Ho-
lang Shan (38° 32' N. lat.), the valley has not been visited by Europeans. At this place the river runs in a wide valley which is fed by many rocks, and which are fed by the waters of the river, and in which rice is ex-
tensively cultivated. There are also numerous plantations
of fruit-trees. The soil contains much saltpepper.
The town of Ning-hia, the ancient capital of Tangut, is of consider-
able extent, being fifteen li (equal to five miles) in cir-

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It has some very good manufactures of carpels and paper, and a considerable commerce with the nomadic tribes who wander about in the country west of the Holang Shan. Below the town of Ning-hia the valley of the Hoang-ho grows wider, as the range of the Holang-shan retires. The valley of the Hoang-ho is about 180 miles wide, and is crossed by many smaller streams which are cultivated. Other grain is still grown about 30 miles farther north, where the country gradually changes into a sandy, and desert, interspersed with hills, swampy tracts, and pastures.

The lateral valley of Si-ning-tcheou opens to the Hoang-ho from the west above the town of Lan-tcheou between the Kilian Shan and the most elevated portion of the Siue Shan. This is not extensive as it appears to be hilly till it contains the town of Si-ning-tcheou, which is not quite as large as Ning-hia, but a much more commercial place, as the road which connects northern China with Hansia in Tibet passes through it. This road leads from Si-ning-tcheou westward over a chain to the lake of Khookhoo-nor, which is of great but unknown extent. It is an alpine lake enclosed by high mountains, and has no outlet.

The remainder of the road lies partly over numerous mountain-passes, traversed only by thorough- greys and raves, and partly over rocky and sandy table-lands, and the whole is described as a desert, in which only a small number of nomadic mountain-dwells are met with, and where the traveller for forty days' journey finds no other accomodation except that of the tents of his caravan. In spite of the difficulties, the road, as it appears, is much travelled, and the bazaars of Si-ning-tcheou are well provided with provisions and articles of luxury. Even coffee and dates may be got there. This town is also the depot of the Turkish rhubarb, which grows, as it appears, only on the more elevated parts of the Siue Shan and Kilian Shan, and is sent from Si-ning-tcheou to all parts of the world. Before the commerce between China and Siberia was established, this article was brought to Europe through Turkistan, Persia, and Turkey, and therefore is still called Turkey rhubarb, though at present it comes through Kinchta and Russia. When the Jesuits, who had been sent to these countries by the emperor Kang-hi, were at Ning-tcheou, it was in 1818, the quantity of rhubarb which, during the months of October and November, was daily brought from the adjacent mountains to the town.

The northern part of Tung-tu, with the exception of the valley of the Hoang-ho, is occupied by a wide desert plain, which constitutes a portion of the Gobi. [Goor, vol. xi., p. 286.] The steep declivities of the Kilian and Nan Shan however do not come close to the desert, but are separated from it by the same distance of 30 to 40 miles. The part contains some extensive tracts fit for cultivation, and in which some large towns have been built, as the great commercial route which connects China with the country on the west runs longer through the hilly tract, and is confined to it by the extensive sandy desert on the north, and the still less practicable mountain-desert which bounds it on the south. According to our best information, the ranges of the Kilian Shan, and especially the Nan Shan, are covered with eternal snow, and one would imagine that they gave origin to rivers which bring down a great volume of water, but that is not the case. The volume of water is very moderate: a part of it is absorbed by the snows, and the remainder is absorbed by the sandy soil, as soon as it reaches the plain, after having left the hilly tract. This evidently shows that the watershed of the mountains must be at a very moderate distance from the Gobi. The surface of the hilly tract consists of an alternation of high lands and depressions, running from the mountains northward to the border of the desert. The high lands are of considerable extent, their upper surface broken and rocky, and only occasional watercourses with a thin layer of sand, but until the growth of trees. In general the rocks are bare. The depressions between these high grounds are least extensive, but exhibit a considerable degree of fertility where they are irrigated. Even in these parts which are beyond the reach of the irrigation of water are obtained. In the midst of this hilly region, and the great commercial road which runs through it, against the nomadic tribes of the Gobi, the Chinese have continued the Great Wall along its northern border westward 950 E. long., and along the wall are built the fortresses which protect the line of the towns through which the road runs. The road leaves the valley of the Hoang-ho at the town of Lan-tcheou [China, vol. viii., p. 80], the capital of Kansi, and runs in a north-northeast direction over a stony and hilly country to the town of Liang-tcheou, a considerable place, of which however nothing is known. It is situated in the district in which all is considered fertile, and contains a great number of villages.

From Liang-tcheou the road runs north-west to Kan-tcheou-foo, a large and well-built town, which has many manufactures of silk and feldspar. From here there is a demand among the nomadic tribes of the Oitoh Taboros, who inhabit the contiguous part of the Gobi, and bring to the place their wool, horses, cattle, and sheep. It receives also large quantities of rhubarb from the Kilian Shan. This road continues through the hilly region, which direction to So-tcheou, a large and well fortified town, with numerous bazaars, well provided with provisions and manufactured articles. The town is divided into two sections, one of which is occupied by Chinese, and the other by the foreign merchants from Bokara and Turkestan. The latter is divided from the former by a separate wall, the gates of which are shut at night: in other respects foreigners do not experience any different treatment than the rest. This road is a place through which the caravans pass before they enter the desert between Tung-tu and Thian-shan-nah: the commerce is very great, especially in provisions. About 50 or 60 miles west of So-tcheou is the most western gate of the wall, and it leads to the town of Yone-stone (jasper), through which the caravans pass to enter the desert of Han-hai, which must be traversed in order to reach Hami in Thian-Shan-Nanlu. This last-mentioned town is 900 li, or 90 miles, as the stage of Kiu-yu-koon, and that is the width of the Gobi at this place, which is considered the narrowest part of it.

The towns hitherto noticed lie along the great caravan-road, but farther west the Chinese geographers mention other places of importance. There is, for instance, the town of Ngan-si-foo, a town of the first rank, and the capital of the whole district. North-west of it, and on the border of the desert, is the town of Yu-men-kiang, which is built near a pass between high hills, through which a road leads northward to Hami, of which we have no information. South-west of Ngan-si-foot are the towns of Toong-hoosang-kiang, and Sha-tcheou. The last-mentioned place, whose name means Sandtown, seems to be the last inhabited place towards the west. It has not been visited by Europeans, except by Marco Polo, who describes it as rather less pleasant: he says that the inhabitants live on the produce of their fields and orchards, and have little commerce. From his account, and that of a Chinese traveller, it is evident that this part of the desert is more extensive than it was supposed to be. Marco Polo reached it after traversing the desert of Lop, by a thirty days' journey, having departed from the town of Lop, which is on the banks of the lake of the same name. The river that runs through this place was mostly covered with sand, but in some places the sea was composed of sand and broken rocks. A Chinese traveller departing from Sha-tcheou, and taking the western route, seems to have traversed a still worse country, until he reached the town of Khotan. [Thian-Shan-Nanlu.]

That portion of the Gobi which lies north of the Great Wall contains many tracts which are covered with grass, and supply pasture to the Oitoh Taboros, but others have no grass, nor stony soil, and are quite barren. In some places there is an extensive swell, but the rivers are lost, which descend from the Kilian Shan, among which the Etzina probably runs more than 200 miles. But the Han Hai, or that portion which lies between the grass of Kiu-yu-koon and Hami, is so shallow that it is rarely met with, and the grassy tracts are still less frequent. The sand with which the surface is covered is very fine, and frequently raised into the air by strong winds.

Our information respecting the climate of Tung-tu is so scanty that it cannot be accurately described. The winters are very severe, and the cold in winter usually lasts several months. The Jesuits found the Hoang-ho near 40° N. lat., at the end of November, covered with thick ice, so that the caravan was able to pass over it, though the river is only 400 yards wide. To Ning-hia a heavy fall of snow was experienced in the middle of October. In summer the heat is great, but much less than in the low countries of China; the climate is considered as extremely healthy.

We are no better acquainted with the productions of
TANJORE and the surrounding country have a rich pastoral industry. There are numerous herds of camels, horses, and cattle, and large flocks of sheep and goats. In the mountain-region is found the yak or mountain-cow, whose tail gives the chowry. It is useful as a means of transportation. There are also the numerous wild animals, such as wild hogs, deer, the argali, and hares. It is also said that in the woods of the Holang Shan there are wild horses. Wild cattle are found on the slopes of the Kilian Shan. No mines are worked. In the desert some extensive tracts are covered with agates, cornelians, and other precious stones, which are collected by the nomadic tribes and sent to China.

The inhabitants of Tangut are a very mixed race. Mohammedan tribes, who may now be called Sjiboko, and which inhabits the western part of the Kunlun mountain range [Tian Shan], extends over the western districts of Tangut. The agricultural population is mostly composed of Chinese and their descendants, among whom a small number of Tartars and Turcomans. The principal tribes are the following:—Cornelians, 79° 55' E. long., is the ancient capital of the raja of Tanjore; there are remains which indicate its former splendour, and its pagodas and tanks are still very fine: it is chiefly inhabited by Brahmans. Devicotts (Devicotta), the fort of the goddesses), 11° 20' N. lat., 79° 55' E. long. Nagore, 10° 49' N. lat., 79° 55' E. long., a sea-port with a considerable export and import trade. NEOPATAM, TRANGEBUR. The villages are numerous, and the population dense.

The ancient sovereigns of Tanjore were the Chola dynasty, who probably gave to the whole district the name Chola Mandala (corrupted into Coromandel), the former term in Sanskrit signifying an orbit or circle, and hence a kingdom. The sovereignty of this monarchy was wrested from its original Hindu sovereigns by the Mahatta chief Eccejee, the brother of Sivajee, in 1675. It has ever since been retained by the Mahatta race; so that, though the language of the inhabitants is Tanul, the language of the court is Mahatta. In 1771 a dispute broke out between Mohammed Ali, the nabob of the Carnatic, and Tuljiee, the raja of Tanjore, with respect to the keeping in repair the mounds which prevent the stream of the Cavery from falling into the Coleroon. The mounds are in the territory of Trichinopoly, and the nabob as sovereign of that territory, claimed the right of repairing, and consequently of neglecting to repair, by which a portion of the nabob's territory might have been deprived of water. The raja had been compelled to pay tribute to the nabob, but had never been subject to him, and appealed to the British to protect him in his right to repair, which had always been exercised by the rajas of Tanjore, and for which, he contended, he paid his tribute. The British however took the part of the nabob. On the 20th of August, 1773, the siege of the city of Tanjore was commenced, and a passage twelve feet wide having been cut across it which surrounded the city, on the 10th of September, when the sun was in the meridian and the raja's troops were taking repose, the British unexpectedly made the assault, and carried the fortress, with hardly any resistance on the part of its inhabitants. The raja was then made subject to the nabob; but in consequence of the disapprobation which these proceedings met with in England, on the 11th of April, 1776, the raja was restored to his independence...
oration of the raja to his former independence was proclaimed by the British. In 1790 the territory of Tanjore was subjected to treaty by British authority. The raja retains the forts of Tanjore, which are garnisced by him, subject to certain conditions laid down by the treaty between the two parties. The raja is given a support of two hundred rupees annually, and the revenue of the town in specified. He has a clear allowance of a lac of rupees annually, and one-fifth of the surplus revenue of the territory, after payment of the civil and military establishments, which amounts to at least one hundred rupees. He also retains his palaces, and also a tribute paid to him by Tranquebar.

The present raja is Swajee, the son of Sarbojeo, who was adopted by the previous raja Tuljaje, or Julin Malah, and was substituted to his claim by him in the court of Schwartz. Of the circumstances under which the sovereign power was ultimately obtained by Sarbojeo from Ameer Singh, the half-brother of Tuljaje, an account is given in the article Schwartz.

(Hamilton's *India Gazetteer*; Malcolm's *Travels in Hindustan and China* 1830-7; Mill's *History of British India*, by H. H. Wilson.)

TANJORE, the capital of the district of Tanjore, in 10° 47' N. lat. and 79° 13' E. long., is about 40 miles east of Trichinopoly, and about 57 miles west from the Bay of Bengal, direct distances. The city is situated not far from the south bank of the Cavery, and is five or six miles in circumference, including the suburbs. It is a place of great interest, and is defended by two forts, which are connected, and both are surrounded by walls built of large stones, and by broad and deep wet ditches. The city is in a flourishing state: it is regularly built, and is said to contain a hundred thousand good households, and is one of the most important towns in Southern Hindustan. The population is probably not less than 70,000 or 80,000. The palace of the raja, where he resides, is in the larger fort: in one of the halls of audience is a colossal statue of Sarbojeo, by Flaxman, which was executed by commission from Sarbojeo himself. The palaces of Tanjore are very large, with paved yards and extensive gardens: one of the largest in Hindustan is situated in the smaller fort: it contains a bull finely sculptured in black granite. The Protestant Mission church was built at the expense of the missionary Schwartz: it is a spacious and handsome structure, and has been thoroughly repaired by the present raja. Schwartz was buried behind the pulpit; the spot is marked by a slab, on which is an inscription in English poetry, ascribed to the raja Sarbojeo. Service is performed in the church on Sundays both in Tamil and in English. The Protestant communicants belonging to the Tanjore mission amount to about 700, and there are also between 400 and 500 Roman Catholic converts, who are chiefly Frenchmen.

(Hamilton's *India Gazetteer*; Malcolm's *Travels in Hindustan and China*.)

TANK, a reservoir for water or other fluids. The name is applied to large tanks or reservoirs, formed by excavating the ground and disposing the removed earth in the form of banks to retain the water; but the tanks which will here be especially treated of are the smaller covered reservoirs used to collect and retain water and liquid manure for domestic and agricultural purposes. Recepting the construction of ponds it will be sufficient to refer to Embankment, vol. ix., p. 373, for the method of forming the retaining banks, and to Caskell, vol. ii., for a description of the process of puddling with clay, which is always necessary in forming a receptacle in a porous soil, unless the more expensive method of paving or lining with chalk, bricks, stone, or timber, be resorted to. See also Sluicer, vol. xxii., p. 142, for a notice of the means used to regulate the draining off of water from ponds, and to prevent accident from their becoming over-filled.

In high mountains, tanks are indispensable to supply both men and cattle with water; and they are of course necessary for a healthy and comfortably constructed settlement as are hand. In the pastures of the Jura, between France and Switzerland, the tanks are usually made of wood, in the following manner: a square excavation is made in the ground, into which is lined with a coating of clay or impervious earth to prevent the escape of the water; fir-trees, deprived of their bark, are then laid close together and fastened with wooden pins, so as to form the floor, and the sides are lined in a similar manner. The tank is covered with a roof of the same mate-

rials; but this, instead of rising from the sides to a point or ridge, according to the form usually adopted in roofing, is made in the shape of an inverted hollow pyramid, so that it acts as a funnel to conduct all the rain-water which may fall upon it to the tank below, and to prevent the tank from being exposed to the sun or rain. Such tanks are usually placed at a small distance from the habitation and cowhouse, if there be one; and the water from their roofs is generally conveyed through hollow wooden conduits, and roughly hollowed out, to the fummelled roof of the tank. They are usually of a cubical form, from 15 to 20 feet square; but if a larger size be required, an oblong shape is preferred, the depth and width seldom exceeding 40 feet. Such tanks are generally constructed to afford an abundant supply of water, although, in summer, thirty or forty head of cattle may be supplied exclusively from them.

The importance of collecting rain-water for domestic purposes, especially in districts where springs are deficient or lie at a great depth, has been much overlooked in this country. Waistell, in the work referred to at the end of this article, urges the importance of placing spouts round all the buildings of a farm to collect the rain-water which falls upon them into a tank or tanks; observing that, besides the value of the supply of water thus obtained, the buildings will be benefited by the walls and foundations being kept drier than when the water from the roofs flows down without the intervention of tanks. The quantity of water that falls annually upon every hundred superficial feet or square of building (in Great Britain is about 1400 imperial gallons; and this statement appears to be corroborated by the remarks of Dr. Loudon, in an article RAIN, vol. xix., p. 270. If the external surfaces of roofs were adapted to the collection of the rain-water which falls upon them, and means were provided for conveying it to covered tanks, in which it might be preserved from dirt, it would oftentimes add to the mixture of impurities, almost every house might be rendered, and cheaply supplied with a quantity of wholesome water sufficient for the ordinary wants of its inhabitants. The extensive roofs of churches and other public buildings might be employed in like way to collect some of the supply of ponds or tanks for public use. In some cases even the drainage of lands might also be made available, as the water may be submitted to any required process of filtration before it enters the tank.

Tanks or cisterns to hold water for domestic purposes may be conveniently situated beneath the surface of the ground, so that, being paved over, they occupy no valuable space. They are formed of stone slabs grooved together, and set in cement, and occasionally of large paving-tiles buried in cement; of brick-work; of plates of cast-iron; or of thick wooden planks, protected by charring and pitching, or lined with sheet-lead. The material of the walls may be circular, or square, being built like a well, with bottoms of an inverted dome-shape, of very slight convexity. The top is also dome-shaped, and has an opening in the centre large enough to receive a man, in order that the tank may be thoroughly cleaned out when necessary. This opening, which may be upon the surface of the ground, or a little above it, should be covered with an oak plank pierced with a number of holes, or with an iron grating. The depth and width of the tank should, it is stated, be nearly equal. If necessary, a small brick chamber is set into the side of the tank, in which the water may be filtered through gravel, sand, charcoal, &c. before entering it. It is recommended to make the opening by which water enters the tank near the top. Brick tanks of this description may be rendered water-tight by laying the inner course of bricks in cement, and plastering the whole of the inside with the same to the thickness of about three-quarters of an inch. To enable them without injury to be emptied they should be fitted with a suit of metal doors, which should be clamped closely round the brickwork, and it should be allowed to settle thoroughly before any great quantity of water is admitted. Loudon describes another tank in the gardens of Mr. Mait; to save expense in construction, by adopting a figure of maximum capacity and minimum surface. Mait proposes, when the tank is large, to adopt the spherical form; and when of less than six or six feet in diameter, that of a short vertical cylinder with hemispherical ends. By puddling
with clay roundabout the tank, the necessity for the use of Roman cement is avoided.

In the forty-ninth volume of the 'Transactions' of the Society of Arts (part ii., p. 12), is a communication from Mrs. Davies Gilbert respecting a cheap method of constructing houses or water-carts. The construction consists of two bag ends of close grey chalk lime (made of chalk marl) well broken up, with three measures of clean sea-sand. The side walls were built of the same materials, leaving a small space at the back of the wall, which space was filled up with the same soil. This was covered over with a dome, formed, without any centering, of smaller flints well bedded in mortar. A hole was left in the centre, and covered with a hood, within which was hung a pulley with rope and bucket for drawing water from the tank. This account was published in 1833, and in 1837 an article appeared in the 'Labourers Friend Magazine,' in which it is stated that such tanks had been found very useful during three dry summers. One, less than the height of a man, had accommodated two families during that time, while most of the springs in the neighbourhood were dry. This paper describes a brick tank with sloping sides, the diameter at the base being smaller than at the top, and with a dome-shaped foundation, being two-thirds beyond that immediately below it, and balancing the weight by filling up the back with earth as the work proceeds. One of the flint tanks, constructed as above described, at the Eastbourne workhouse, is twenty-three feet deep and eleven feet wide. Only ninety bushels of lime were allowed for its construction, including two coats of plaster, and the work was executed at ten shillings per hundred square feet.

In the article last quoted from, it is observed that a current of air has been supposed to promote the purity of the water preserved in tanks. If so, it may be easily provided for. Where the prevailing winds do not blow soon and leave upon the roof, the water is found to remain good, even for drinking, without clearing out the rubbish more than once a year.

In addition to tanks for water, every farm-yard should have one to collect the liquid portion of the manure, which is washed by the rain through the refuse litter, and also the urine of the stabled cattle. Though not yet generally adopted in England, in France, Germany, and especially in Belgium, such tanks are considered as necessary to a farm as any of its most common buildings. They are usually constructed of bricks or a bag made of mortar, cemented with one or more divisions, and capable of containing at least ten times as many hogsheads as there are heads of cattle on the farm. They are vaulted over, having at the top an aperture, in which a pump is placed, sufficient to allow a man occasionally to clear out the sediment, when the liquid has been pumped up. The best shape to contain a large quantity in the smallest space would be like those before described; but they cannot be conveniently made sufficiently large, and a cubical form, or rather that of several cubes in succession, is preferred. A tank for a farm of 200 acres of arable land should be 15 feet wide, 15 deep, and 48 long, giving 3 cubes of 15 feet, or 322 cubic feet of liquid. In this tank the urine is diluted with water to prevent too rapid decomposition, and also to retain the ammonia which is formed; for which purpose gypsum and sulphate of copper are sometimes put into the tanks.

If the soil be not sandy, clay will answer instead of mortar to connect the brickwork, and a plastering of lime or cement will be sufficient to keep out the worms: but in very porous soils the bottom and sides must be puddled, to keep in the water and prevent destruction of the brick; but the walls in cement altogether. The liquid from the yards and stables is carried into the tank by a main drain constructed of brick or stone, and which receives a number of smaller drains from every part of the yards and stables, and the liquid is carried away, and none of the richness of the manure is lost by evaporation.

Sometimes the tank is vaulted like a cellar under the cow-house and stables, which are washed out twice every day, and all the dung and water are swept into a cess-pool communicating with the tank. Thus a very diluted, but rich liquid soon fills the first division of the tank: a sluice is then shut, and the next washings run into a second division, and when that is full, into a third. In the meantime the contents of the first tank have undergone a certain fermentation, by which the caustic ammonia first evolved has become mild and impregnates the water. It is then in a fit state to be carried on the land in a suitable vessel. Where proper precautions are taken to prevent the water from being exposed to evaporation in a surprising degree; but if put on fresh, it burns the grass or any vegetable it touches, because the ammonia is in a caustic state. If a cow drop her urine in a field in a hot summer's day, all the grass it comes in contact with is killed, and for some time after the same happen in rainy weather, the spot soon becomes very green, and the grass luxuriant; because, in this case, the urine is amply diluted and its caustic nature corrected.

Those who live near gas-works may collect the ammonical gas-water in a tank and, by the addition of sulphuric acid in very small quantities, they may produce a very fertilising liquid, which will stimulate vegetation, and be a very good manure.

The necessary accompaniment of a tank, whether for water or manure, is a water-cart, that is, a large cask put upon wheels to bring water from some distance. When there are no means of bringing water in pipes, a water-cart is quite indispensable. It is simply a frame of wood, or with plug-hole in the end or lower part, from which the water may be let out by a cock, or drop on a flat board or into a bucket with holes, so as to spread it about. The plug-hole is shut by a valve inside, which can be opened. This is a preservative of the liquid keeping it close to the plug-hole.

Many of the artificial manures, of which a number have been lately proposed, would make excellent liquids by merely mixing them up with water in a tank, and altering a certain degree of fermentation to take place. Nothing is lost, and all volatile substances are taken up by the water. The soluble portions are dissolved and the earthy matters diffused, so as to be more equally spread over the land. If it be true that the ammonia found in some plants is chiefly derived from the very small portion discovered in rain water, it follows that a scarcely perceptible impregnation with this salt may have most powerful effects on vegetation.

When a farm-yard is situated on a hill, and there are fields or pastures on a lower level, at no great distance from it, the liquid from the tank may be conducted by channels lined with clay, having small sluices to direct the streams to any particular field. Thus it is capable of irrigating terraces by a considerable surface, which it will greatly enrich. It may be led into the common furrows between the lands or stitches in ploughed land, and allowed to soak in them, and then it can be spread with the earth of the furrow, by which means the broad shovels, or the furrowing, and the particle of manure stuck on the surface, and the composted refuse and manure will greatly invigorate them. This species of irrigation is common in Lombardy, where much ingenuity is shown in the manner in which water is made to flow in small rivulets between the rows of growing vegetables. The water here is supplied by streams, but the same method would distribute the tank-liquor with great effect. A very small quantity of this liquor, allowed to flow into the main feeder of a water-meadow, will soon prove how great effects can be produced on various productions which are scarcely perceptible by chemical analysis.

Small as the experience has hitherto been in this country of the advantages of liquid-manure tanks, it has sufficiently proved their value to induce every man who can, to construct a farm-yard and erects buildings to take in the tank as an essential part of his plan; and even if it only collected the refuse fluids which are allowed to run off in common sewers from most houses, it would soon repay the cost of the structure. It will, while it renders the neighbourhood less subject to noxious emanations from the corrupted matter which now flows into them. The passage of air into or out of a manure-tank, and the consequent exhalation of noxious vapours, may be prevented by the use of a simple machine to communicate that same pressure described under Sawans, vol. xxi., p. 319, at the points where the drains enter it.

The use of metallic cisterns or tanks, in lieu of wooden casks, for containing a supply of fresh water for long
voyages, is one of the great improvements effected of late years in naval economy. The nineteenth volume of the 'Transactions of the Society of Arts contains an account of experiments on this subject, by General Samuel Ben-tham. Two years ago, the success of which induced the Society, in 1801, to present him his gold medal. Large earthen jars have been tried for this purpose; but, while they keep the water very pure, they are not so convenient for general use as metallic tanks, which may be adapted to the shape of the vessel, so as to avoid any loss of room.


TANNAHILL, ROBERT, born at Paisley, in Scotland, on the 3rd of June, 1774, was the son of poor parents, by whom he was brought up to the occupation of a weaver, in a small volume, which he pursued in his native town and at Glassop. The earliest pre-delection of Tannahill was for poetry, and his taste was formed by the constant study of Allan Ramsay, Ferguson, and Burns. He failed to attain the spirit of these masters of Scottish song; but his pieces generally excel theirs in grace and sweetness. A specimen of this sweetness is found in his famous song, 'Gloomy winter's now awa:"

'Twixt the Newton wooded,
Living on the same white woods;
Billies saunters, vi. downwale buda,
Adorn the lane's weee teriee, O.
Robert's a man of a slafs, Nanny maids
Frolick by breacks fring the rooks,
Brace the bornie jocks,
Ifik thing is cheerful, O.

'Jessy, the flower of Dumblane,' is his best-known effort. The 'Song of the battle of Vittoria' has the merit of redeeming from the degradation of worthless words one of the finest airs of Scottish minstrelsy, and restoring it from a whistled jig to the solemn tone of a triumpathal song.

His songs were commonly inspired by the immediate occasion; were the unlaboured fruit of his imagination or fancy; and his greatest charm of his style was a perfect mastery of his language, which is almost exclusively Saxon, they derive not a little of their effect from the voice of despousing melancholy which runs through them. This melancholy was in some degree constitutional in Tannahill, but it was aggravated by the neglect of the world, and a hopelessness of ever raising himself above circumstances so unfavourable to genius as those in which fortune had thrown him. A kindred spirit, the Ettrick Sheep, begins life the pilgrimage to rouse him at Paisley. After a night spent in the most delightful interchange of feeling, Mr. Hogg took his departure. 'Farewell, we shall never meet again,' were the words emphatically pronounced by Mr. Hogg on Tannahill, and their meaning was shortly afterwards explained. He committed suicide by drowning himself, in his thirty-sixth year. His remains are interred at Paisley.

Tannahill's songs were published in Paisley, in his lifetime. They are in every modern collection of Scottish melodies, and are occasionally printed (under Tannahill's name) with selections from Burns. For his life, see Chambers's Scotch Biography.

TANNER, THOMAS, was the eldest son of the Rev. Thomas Tanner, vicar of Market Lavington, Wiltshire, where he was born, 25th January, 1674. In November, 1693, he was entered a student of Queen's College, Oxford; but after having taken his degree of B.A., he removed in January to Westminster, where his conduct was such as to merit the approbation of society, 2nd Nov., 1696. So early as 1693, when he was only nineteen, he had published proposals for printing all the works of the antiquary John Leland, from the original manuscripts; but this project, which was afterwards partially executed by Hearne, did not receive such encouragement as to induce him to proceed with it. The reputation he had early acquired for his knowledge of English antiques may appear from the fact that Anthony a Wood, in the death of the editor, left his papers to Tanner's care. That same year Tanner published at London his first work, an 8vo. volume, entitled 'Notitia Monastica, or a Short Account of the Religious Houses in England and Wales.' Having taken orders, he was soon after appointed by Dr. Moore, bishop of Norwich, one of his chaplains; and having, in 1701, married Rose, the eldest daughter of that prelate, he received various preferments from his father-in-law; the chancellorship of Norwich about the time of his marriage; the office of commissary for the archdeaconry of Norfolk in 1719; that of commissary for the archdeaconry of Suffolk in 1707; and, in 1713, a prebend in the cathedral of St. Paul, to which post it seems Moore had been by this time removed. Meanwhile Tanner's wife died, at the age of twenty-five, in 1706.

In the same year he was presented by a friend to the rectory of South Duddington, near Northampton; married Frances, daughter of Jacob Preston, Esq., of London, whom however he lost in 1718. His next publication, a new edition of Wood's 'Athenea Oxonienses,' enlarged by the addition of 200 additional volumes, appeared at London, in 2 vols. fol., in 1721. James Tanner, who had taken his degree of D.D. in 1710, was appointed by Dr. Green, bishop of Norwich, to the archdeaconry of Norfolk; and in 1723 he resigned his prebend at Ely, and was appointed canon of Christ's Church, Oxford. He was consecrated to the bishopric of St. Asaph, in January, 1732; and in May, 1733, he married Mrs. Elizabeth Scottow of Thorp, receiving her with a fortune of 15,000l., but he did not long enjoy these acquisitions of wealth and influence, his death occurring on the 14th of December, 1735. By his second wife he left one son Thomas, who died rector of Hadley and Monks' Ely in Suffolk, and prebendary of Canterbury, in 1760.

Tanner was a friend of Robert Burns, and was known to Mrs. Mary and survived to 1771. A new edition of the 'Notitia Monastica' with large additions (in part by the editor), was published in a folio volume at London, in 1744, by the bishop's brother, the Rev. John Tanner, vicar of Lowestoft in Suffolk, the second edition, with five additional volumes, by the Rev. James Nasmith, appeared at Cambridge, in the same form, in 1797. The greater part of this last impression having been consumed in a fire which happened at Mr. Nicholson's printing-house, on the night of Monday, the 8th of February, 1808, the business was very scarce. But Tanner's literary reputation rests principally on his great biographical and bibliographical work, entitled 'Biblio Sacra, Biblianico-Hibernica, sive de Scribtoribus qui in Anglia, Scotia, Hibernia, et totius Britanniae, temporibus Romano, literarum ordine, juxta familiarum nominis, dispositis, Commentarii,' which had been the labour of his leisure for forty years, and which was published, in folio, at London, in 1748, under the care of the Rev. Dr. David Wilkins. It is a work of extensive research and great general accuracy. Bishop Tanner had made large collections of charters, grants, deeds, and other instruments relating to the national antiquities, which he bequeathed to the Bodleian Library. Some letters and other papers have been published in Dr. Bliss's collection of 'Letters written by Edmund Pernson,' &c., 2 vols. 8vo., Lon., 1813. ('Biographia Britannica.')

TANNIC ACID, or TANNIN, a peculiar vegetable acid existing in every part of the bark of each species of quercus, but especially in the bark: it is found however in the greatest quantity in the gall-nut. The name of this substance is derived from its property of combining with the skins of animals, or in tanning, by which they are rendered impervious to water, and prevented from putrefying.

To prepare tannic acid, galls are to be reduced to coarse powder, and digested in a percolator in water which has been previously mixed and shaken with water. The lower part of the vessel two strata of liquid appear, the heavier of which is a strong solution of tannic acid, by evaporating which, and by subsequent purification, the acid is obtained possessing the following properties:—It is a colourless or slightly yellowish mass, which does not crystallize, but resembles dried gum. It is readily soluble in water; the solution has an astringent but not a bitter taste; it forms brownish-black blues, and decomposes alkaline carbonates with effervescence, but not at all when it is a little only; when the aqueous solution is exposed to the air, especially if the temperature be high, it forms a gas sab, and absorbs an equal volume of carbonic acid gas. By adding alcohol, the tannic acid is precipitated into gallic and elagic acids. Tannic acid precipitates many metals from solution; the compound has been called tannogelatin, and when the acid is in excess a viscid elastic mass is formed, which contains about half its weight of tannic acid; when the liquid from which the gelatin is pre-
The preparation of tans by tanning or other analogous processes has been practised from the earliest times; and, although it has engaged the attention of several scientific men, and has been the subject of many curious experiments, some effects are produced by forcing oil or grease into the pores of the skin, or by preparation with alum; processes which may be briefly noticed in connection with the more immediate subject of this article.

TANNIN, ARTIFICIAL. It has been shown by Mr. Hatchett, that when powdered charcoal has been digested for a considerable time in dilute nitric acid, it is dissolved, and a reddish-colored liquid is formed. On the addition of an insoluble and insoluble compound with gelatin. Although in certain respects the above artificial substance agrees with tannic acid, yet the late discoveries as to the real nature of this principle tend to the opinion that the natural compound is essentially different from the artificial.

TANNIN, PURE, OR TANNIC ACID, Medical Properties of. This substance in combination with extractive has been long known under the name of tannin, and recognized as a valuable ingredient of many materials. [ASTRINGENTS.] As many of these are powerful in restraining excessive discharges, whether bloody or otherwise, it was conjectured that the pure principle would be yet more efficacious in a state of combination. Accordingly it has been administered in some passive hemorrhages, chiefly from the uterus and the bronchial tubes. To effect any good it requires to be given for several days in small doses. It is a very form of Arthur, being with great reluctance taken up by the lacteals, and producing very great constipation, from its direct astringent action over the intestinal canal, with which it is brought into contact. Tannic acid has been benefitted in cases of indigestion and incomprehensible organic diseases affecting the uterus, accompanied with wasting discharges. These it may for a time moderate, but the constitution induced never fails ultimately to aggravate the disease and discomfort of the patient. There is little therefore to induce practitioners to employ it.

TANNING is the process of converting the skins of animals into leather, by effecting a chemical combination between the gelatin of which they principally consist, and an astringent vegetable principle called tannin. [BARK, vol. iii., p. 456; LEATHER, vol. xiii., p. 379; and the preceding chemical articles on TANNIN.] The object of the tanning process is to produce such a chemical change in skins as may render them, as observed by Dr. Ure, unalterable by the external agents which tend to decompose them in their natural state; and, in connection with the subsequent operations of dressing, or currying, to bring them to a state of pliability and impermeability to water which may adapt them for the many useful purposes to which they are applied. Sixtine effects are produced by forcing oil or grease into the pores of the skin, or by preparation with alum; processes which may be briefly noticed in connection with the more immediate subject of this article.

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the raising process loses its substance when conditioned by the shoemaker’s hammer.

Different tanners vary much in the details of the above-described preparatory processes, as well as in those which follow, which constitute the actual tanning, or the various versions of the prepared ‘pelt’ into leather. Oak bark is the substance most commonly used to supply the astrin-gent principle, and it is crushed or ground to a coarse powder in the tanner’s yard. The native bark is then filled with water. After some months the pit was emptied and re-filled with fresh bark and water, and this process was repeated whenever the strength of the bark was exhausted. In this way the time required for imregnating the hides varied according to their thickness and other circumstances, from one to four years. The process has been greatly expe-dited by the improvements introduced in consequence of the experiments of M. Seguin, a French chemist, which are detailed in Nicholson’s ‘Journal,’ vol. i., p. 271 (quarto series, published in the year 1797), of tanning with concentrated solutions of bark, formed by passing water through a mass of powdered bark, until, by successive infiltrations, it is completely deprived of its soluble matter. Seguin also found that, by the use of very strong solutions, hides and skins might be tanned in as many days as, under the old system, they would require months; but these expectations have been very much disappointed. When tanned through the system, which has been very extensively adopted, has been productive of an important saving of time. Without entering into a minute investigation of the objections to the use of concentrated tanning infusions, it may be sufficient to state that, as observed by the late Sir Ham-phry Davy, in his valuable paper on the operation of astrin-gent vegetables in tanning, published in the ‘Philosophical Transactions’ for 1803, experience shows that skins when tanned by the use of strong solutions, produce leather of less durable quality than that which is slowly formed. Dr. Ure, in reference to this important point, says (Dict. of Arts, &c., p. 1200):—‘The older tan-ners, who prided themselves on producing a substantial article, were so much impressed with the advantages of slowly impregnating skin with astringent matter, that they employed no concentrated infusion (ozone) in their pits, but stratified the skins with abundance of ground bark, using in this manner, as they say, the active principles are so very soluble, and that, by being gradually extracted, they would penetrate uniformly the whole of the animal fibres, instead of acting chiefly upon the surface, and making brittle leather, as the strong in-fusions do. In illustration of these remarks he states that 100lbs. of skin, quickly tanned in a strong infusion of bark, will produce 137lbs. of leather, while the same weight of skin, slowly tanned in a weak solution, produce only 117lbs.; the additional 19lbs. in the for-mer case tending to swell the tanner’s bill, although it deteriorates the leather, and causes it to contain less of the textile animal solid. Leather so highly charged with tannin is, moreover, so spongy as to allow moisture to pass through it, and its pores: heat, alcohol, and increase of product are strong temptations to the tanner to adopt the system of tanning with concentrated infusions. The variations of practice among different tanners extend to the substance used as an astrigent, as well as to the manner of applying it. Ground oak-bark, which was formerly the only material in common use, and is still the most general, produces good leather of a light-fawn colour, which, consequently, is the most extensively imported for the use of tanners, produces leather of great solidity and weight, the colour of which is inclined to grey, and which, according to the ‘Encyclopedia Britannica,’ ‘is more impervious to water than that made with oak or other species of bark.’

Alginops (Quercus, vol. x., p. 214), and is brought from the Levant and the Morea. Catechu, or terra ja-ponica, the insipid extract of the Acacia Catechu [Catechu, vol. vi., p. 267], produces leathers of a dark reddish brown colour, which light, spongy, and very pervious to water. Another substance which has been used of late years is a kind of bean-pod called divi-divi. These substances may be used either individually or in various combinations, but in such a manner of passing water through them there is a considerable variety. Some tanners use cold water for the purpose, and others hot water or steam; others again, instead of pure water, employ ozone, or boiling liquid, which has been exhausted by tanning and is then used again. In addition to the above, the solutions used, which vary exceedingly. When the imregnation of the hides with tannin is effected by laying them flat in the tan-pits, they are frequently taken out to renew the solution; and the skins which have lain a considerable time, will be for a short time after the next, so as to equalize the amount of hydrostatic pressure. Sometimes the tanning is facilitated by suspending the skins vertically in the liquid, by which means they are prevented from being pressed by the weight of the skin room; and, unless the skins are frequently moved, it occurs injurious folds in the leather. Another plan, which answers well for small light skins, that require but a short time for tanning, is to sew up the skin into the form of a bag, to fill it with tan-ligur, and then immerse it in the pit. The great space required is the principal objection to this plan. In whichever of the above ways the tanning is effected, the hide is subjected to the action of solutions tannated or tannate, until it is so perfectly penetrated, that when cut through it presents a uniform brown colour; any appearance of a light streak in the middle of its thickness being an indication of imperfect tanning. When the process is complete, the leather is of the required quality; but, if the tanning is weak, and, while they are drying, they are compressed by beating or rubbing, or by passing them between rollers, to give them firmness and density. A yellow deposit is now found upon the surface of the leather, to which the name of tanned is frequently given; and, although this deposit is subsequently removed by the shoemaker in the operation of buffing, and forms a useless addition to the weight and cost of the leather, it is still productive of much annoyance, and prevents the skin from adhering to the surface of the tanner. According to the explanation of the ‘Encyclopedia Britannica,’ this bloom consists of the finer portion of the gelatin from the interior of the skin, dissolved by the exhausted ozone which remains upon the surface, and is the waste and deterioration occasionally occasioned by its formation should be prevented by the careful removal, by pressure, of the exhausted ozone.

Although no one attributes the tanning of the leather to any one cause, it is generally known that tannin is the pre-eminent cause. Mr. Francis Spilsbury obtained a patent in 1823 for effecting this object in the following manner:—‘The hides, after being freed from hair, cleansed, and otherwise prepared in the usual manner, were to be carefully examined as to soundness, any accidental holes being then sewed up, so as to make the skin water-tight. Three frames were to be provided of similar shape, and of such a form and size that when laid upon each other, with two holes placed between them, the frames could be filled with tan liquor passing through projecting ears, so that the whole should form a flat water-tight chamber, circumscribed by the middle frame. This apparatus was then placed in a vertical position, tan-ligur was introduced into the chamber or tannery, and the apparatus was laid upon the centre of the Quaker’s tannery, and the frames suspended over it, the air being allowed to escape by another pipe, which should be closed as soon as the chamber became filled with the liquid. The tan-ligur being supplied from an elevated cistern, any required degree of hydrostatic pressure might be produced in the chamber,'
the effect of which was to distend or swell out the sides, and to force the liquid through the pores of the skins, making its appearance on the outer sides like drops of dew or perspiration. When the leather appeared to be sufficiently tanned, the liquor was drawn off by a stopcock, and, after it had stood some time, the outer edges of the hide were cut off. Spilsbury's process was soon abandoned; the reason of its failure being, according to the author before quoted, in the Encyclopedia Brittanica, 'that a large excess of tannin dissolves gelatin; so that it is not to be expected that any pricking to be thus tanned could be so well understood, since similar plans were consequently conceived by different persons; but these, or most of them, have been found unsuccessful. Of these, allusion may be made to the process patented by Mr. Drake, which consisted in sewing two skins together (after they had received a slight tanning in the ordinary way), so as to form a water-tight bag, which was filled with tan-liquor. The bag thus formed was compressed between two vertical grooves, alternately, so that the pressure was not sufficient to bulge at the sides, and the liquor was confined to a thin vertical stratum. As in the last process, the aqueous portion of the tan-liquor percolated through the hides; and the air was forced out of the space between the skins, and, being the room so as to promote evaporation from the exterior surfaces of the bags or skins. To prevent the bars of the racks or frames from producing permanent indentations in the leather, it is necessary to shift the bags at least once during the process; and, to prevent the bags from bulging, the sides of the bag were fixed by being sewed up in the form of bags, and supported by a casing of canvas; and in the process of Mr. Chaplin, the bags were laid in an inverted form, and turned continually to equalize the action of the tan. With every precaution, however, it is difficult to tan a hide equally by any such process; and the objection urged against Spilsbury's plan applies to all the modifications of it. In another plan, which has been tried under several forms, the tanning liquid is applied to both sides of the hides, which are placed in an air-tight vessel, and is forced into their pores by hydrostatic pressure, the air being previously pumped out. The operation may be repeated as often as necessary, with infusions gradually increasing in strength; air being allowed to fill the pores of the hide between each immersion. Another plan which may be alluded to here is that of an American tanner, Osmond Cogswell, described by H. C. Stach, of the Franklin Institute, in the Journal of the Franklin Institute. It consists in laying the hides upon a quantity of sawdust, contained in shallow boxes, of which any required number may be arranged in a suitable framework, about twelve inches above one another. The hides are not laid flat, but have their edges a little raised, so that their upper surfaces form shallow troughs capable of holding a layer of the tanning solution, which must be replenished from time to time as it filters through the hide and the sawdust, or other soft porous substance upon which it is laid. The spent liquor runs off from the bottom of the box or trough, which is somewhat inclined for that purpose, into a vessel or channel provided for it. 'The improvement consists, according to Mr. Cogswell, in the use of a thin layer of a solution of oak or other bark to hide or skins in such manner as that when the glutinous (gelatinous) particles of the hide have absorbed and become mixed with the tannin, or tanning principle, the other part of the solution (i.e. the water) may pass off, and leave the hide free to receive more of the solution; and so on till it is tanned.' The operation was performed, it is stated, in a very short time; but as the outer parts or edges of the hide are, to be reduced, if necessary, it is necessary to immerse them in vats in the usual manner for three or four weeks, to complete the process. If the principle were found to be advantageous, this, which forms a great defect in Mr. Cogswell's scheme, might be readily amended.

Still more recent than any of the above-mentioned plans is that patented by Messrs. Heraph and Cox, of Bristol, which, as far as present experience can show, appears to have the desired object very completely. Their process, which was patented November 16, 1837, is founded upon the principle of washing a sponge, by alternately allowing it to imbibe water, and then forcibly express the water out. In the old system of tanning, the hide may be compared to a coarse bag, which, after it has been tanned, its two outer edges are removed to a stronger, without the fluid contained in its pores being squeezed out; while in the new plan the weak infusion, or ooze, is forced out of the pores of the hide before it is subjected to a stronger, so that the fresh ooze may be sucked in again and squeezed out again, and so on, connecting a number of hides together by strings, so as to form a continuous belt, and passing between them rollers turned by steam or other power, while they are being removed from one solution and being introduced in another. The results are tolerably uniform, or continuous sheet of hides, they are either placed alternately head to head and tail to tail; or, if laid across the belt, with the heads and tails towards each side alternately. In one of the arrangements described in the specification, the hides are united into an endless band, and are always passed between the rollers (of which a pair is erected over each pit) in one direction; but in another plan the ends of the belt are not connected together, and the motion of the rollers is reversed when the ends of the belt are reached. The process of tanning the tan liquor alternately on each side of the apparatus. The last arrangement is that described in the recently published article in the EncyclopediaBrittanica, from which the following is quoted: 'The tannin, which is about thirty inches in diameter, and is covered with horsehair cloth; and the upper roller, which is pressed against the lower one with any determinate degree of force by means of weighted levers, is only about eighteen inches in diameter, and is covered with wood, and is so arranged that in the process a strong hide may, it is stated, be tanned through in from one to two months, and calf-skins and hips (the hides of young cattle) in from twenty to thirty days. Should the usual quantity of water be performed; one-half of the capital required in the common process is rendered unnecessary; the saving on labor, labour, and general cost of manufacture is about 1d. per lb.; and the increase in the weight of leather, as compared with that made in the usual way, is as 34 lbs. to 28 lbs. The thick hides, known as 'Butts,' when prepared by the patent process, are sent to market within four months from the time of their delivery in the tanner's yard; and the profits arising from quick returns, great weight of leather produced, and reduced cost of production, are stated to be eight times as great as upon the old plan, the prices of hides, bark, and leather being the same. It should be further observed that the leather made in this way is more elastic and imperious to water than the old.'

Although the general principles involved in the preparation of all kinds of leather are the same, and some of the processes above described are performed with little variation upon the skins of smaller animals as well as upon the thick hides of various kinds of oxen, the precise course of operations requires many modifications which cannot be here described. Of the preparation of several of the lighter and more ornamental kinds of leather, a familiar account is given in No. 602 of the ' Penny Magazine,' which is devoted to a sketch of the processes followed at one of the great leather-manufactories of Bermondsey.

We have hitherto alluded chiefly to the preparation of the thick hides used for sole-leather, among which several varieties of the species may be distinguished by different technical name, by which its thickness, quality, or mode of preparation is known; but the thinnest and weakest hides, as well as the skins of calves and other animals, are also prepared for use as upper-leather. It is necessary to reduce their thickness by shaving or paring them down upon the flesh or inner side, before they are subjected to the action of the tanning infusions. Such hides or skins also require, after leaving the hands of the tanner, to be run through a press in order to give them the necessary degree of flexibility and smoothness. The currier also has recourse to shaving or paring with a peculiarly formed knife, to bring the skin to the requisite tenuity; and it is his business to work its surface, when the leather, is done on the flesh side, although for some purposes leather is blackened upon the outer or grain side. Horse-hides, which are comparatively weak and thin, are sometimes
dressed in the latter way, under the name of cordovan hides, from the circumstance of such leather having been formerly made at Cordova in Spain. Calf-skins supply the quality of leather most generally preferred for the upper part of boots and shoes.

Of the thin skins prepared for ornamental purposes many are tanned with a substance called sumach, prepared from a plant of the same name. [Ritus, vol. xix., p. 384.] At the establishment above referred to, which is commonly known as Neckinger Mills, the process is extremely rapid; the prepared; the most important kind being that called 'Morocco,' which is made from goat-skins. In the routine of operations described in the paper from which we quote, the processes of cleansing the skins from fleshly impurities, soaking them in the vegetable tannin, &c. renders a material variation from those before described. During these processes, the lime employed to assist in the depilation enters the pores of the skin so completely, that it would impede the action of the tanning liquid if allowed to remain. It is therefore removed by immersion in an alkaline solution, which opens the pores in a way resembling the process of 'raising,' described in a previous column. The tanning is then performed by sewing up each skin into the form of a bag, with the grain or hair-side outward, and nearly filling it with a strong solution of sumach in water. The bag is then fully distended by blowing into it, and the aperture is tied up; after which it is thrown into a large still, in which it is continued with hot water until a portion of the sumach is dissolved. The distended bags float in this vessel, and are occasionally moved about with a wooden instrument, until the solution which they contain has thoroughly penetrated their substance. Owing to the thickness of the skin, a further stage is required which impairs the surface that peculiar grain by which morocco leather is distinguished. An inferior kind of leather, known as 'imitation morocco,' is prepared in a similar manner from sheep-skins:

Tawing is the name applied to the process by which the skins of sheep, lambs, and kids are converted into soft leather by the action of alum. Of this kind of leather gloves are usually made. Skins intended for tawing pass through a series of operations resembling those by which skins are prepared for tanning, but they are then subjected to a solution of alum and salt, to which, for the superior kinds of leather, flour and yolks of eggs are added, instead of a vegetable astrigent solution. Sometimes the skins are put into a kind of barrel with the solution, and then the whole is made to rotate rapidly, by which the skins are quickly penetrated; and in other cases the impregnation is effected in an open tub, the skins being worked in the pasty liquid with the hands, or trampled upon the naked feet of a man, until the emulsion is thoroughly incorpored with them. They subsequently require a good deal of stretching and rubbing over a kind of blunt-edged wooden roller, or stone, so as to obtain the requisite smoothness and suppleness. Many of the gloves sold as kid are really made of lamb-skins, of which considerable numbers are imported from the shores of the Mediterranean. These are brought with the wool on; and by means of a sort of roller, &c. passed through a loosening or impregnation of itself in subterranean vaults or cellars; an operation which requires great nicety, since the pelt would be injured by allowing the fermentation to proceed too far. After the wool has been removed, and the skins have been scraped to free them from a slimy substance which exudes from the pores, the pelts are immersed in lime-water for a few days, to remove the grease which yet remains in them. The subsequent operations of removing the lime, tawing, &c., are similar to those referred to with regard to sheep-skins, with the wool on, for housings and similar articles, the wool side is carefully folded inwards, to protect it from the tawing liquid or paste, which is then applied to the flesh side only. Other skins are occasionally tawed into leather without removing the wool or hair.

The only other kind of leather to be here noticed is that in which oil or grease is forced into the pores of the skin. This kind of leather takes its name from a fine soft leather prepared from the skin of the chamois goat; and the process by which it is made is called shamoying or shammying. Such leather was formerly very much used as an article of clothing especially by soldiers; and it is still applied to several useful purposes, for which its peculiar softness and pliability renders it valuable. Wash-leather may be cited as a common example of this kind of preparation. The skins of deer, goats, sheep, &c. are dressed in this way; and much shammied leather is made from the inferior or least regular portion of split skins, in cases where the grained side has been taken off carefully of a uniform thickness for preparation. This may be done by scraping it, and the skins are shammied, the grain surface is removed by scraping or rubbing with pumice-stone. After the usual preparation with lime-water, and subsequent washing in a sour infusion of sumach, the foregoing similar liquor, to remove the lime and open the pores, is passed through the skin, the latter is wringing or pressing them, and, in the process practiced at the Neckinger Mills, are then exposed to the action of fulling-stocks, which consist of heavy wooden hammers, fixed with their point by the action of a pin within a revolving shaft. A wheel revolves near the head of each hammer, of which two are mounted together in one framework; and this wheel is made, during its revolution, alternately to raise the hammer about a foot, and to let it fall into a trough fitted to receive its head. The former, as it were, a roll of the skins which are to be made into leather, is placed in this trough, and beaten by the hammers until it is perfectly dry. Cod-oil is then poured upon the skins, and forced into their pores by the action of the hammers or stocks: the form of the trough being such that the skins gradually turn themselves over and over during the operation, to render the beating uniform. When the oil is thoroughly beaten in, the skins are hung up to dry, after which they are placed on an iron or copper bench, or in some similar vessel, to which oil is supplied and a repetition of the beating. This is repeated eight or nine times, until two or three gallons of oil have been imbued by one hundred skins; and when this is done, they are again immersed in the impregnating liquid, which is placed in large tubs, or hung up in close heated chambers, in which they undergo a kind of fermentation, by which the pores are distended, and the action of the oil upon the fibres is completed; and finally they are immersed in a weak solution of pottash, which removes whatever excess of oil may have remained in the leather, forming with it a saponaceous mixture. They are then hung up in the open air to dry.


TANSFILLO, Luigi, born of a noble family at Nola, in the kingdom of Naples, about the year 1515, wrote in his youth a licentious poem, entitled 'Il Vendemmiatore, or the Vintager,' wherein he deals largely in the obscene jokes and seculurities in which the poetical of his country indulges, without any pretension to give education, something after the manner of the antient Sannazaro. But the author of this work did not intend for the press, was published by some friend through an abuse of confidence. In order to make amends, Tansillo wrote a piou poem, entitled 'La Lagrimaможна ли не съпоставлять ли съ тымъ око, чтoby Vincenzo, something after the manner of the antient Sannazaro. But the author of this work did not intend for the press, was published by some friend through an abuse of confidence. In order to make amends, Tansillo wrote a piou poem, entitled 'La Lagrima...
Don Pedro de Toledo and his son Don García. He accompanied the viceroy in an expedition against the Barbary powers. He died about 1584. He wrote also a georgical poem, entitled 'Il Podere;' and another didactic poem, entitled 'La Balia,' besides sonnets, canzoni, and other lyric poems, in which he has displayed great poetical powers. He has been compared by some with Petrarch.

A complete edition of Tanlillo's works was published at Venice in 1728, in 4to. (Tiraboschi, Storia della Letteratura Italiana; Corniani, Secoli della Letteratura Italiana.)

TANSY. (Tanscortum.)

TANTALIDÉ, a family of Wading Birds. [Grallata-

to-rum.]

The genus Tantalus of Linnaeus stands between the genera Ardea and Scolopax, in the twelfth edition of the Systema Naturae.

Cuvier places the genus Tantalus between the Open-bills (Eriias, Laép., Amphibolus, Ill.) and the Spoonbills (Platulaus, Linn.). He characterizes the genus as having the feet, the nostrils, and the bill of a stork; but the back of the bill is, he observes, rounded, and its point curved downwards and slightly notched on each side: a portion of the head, and sometimes of the neck, is, he adds, denuded of feathers. He notices the following species: the American Tantalus, Tantalus loculator, Linn.; the African Tantalus, Tantalus Ibis, Linn.; and the Ceylonese Ibis, Tantalus leucophaeus, the largest of all.

Of Tantalus Ibis, he remarks that it is white slightly clouded with purple on the wings, with a yellow beak, and the skin of the face naked and red, adding that it was for a long time regarded by naturalists as the bird so much revered by the antient Egyptians under the name of Ibis, but that recent researches had proved that the Ibis is a much smaller species, of which he intends to treat hereafter. This species, he states, is not commonly found in Egypt, but that it had been brought from Senegal. Tantalus he arranges in the family Culturastes. Ibis, Cuv., finds a place in the Règne Animal, as the second genus of Cuvier's Longirostris, between Scolopax and Numenius, Cuv.

Cuvier states that he has separated the Ibises from the Tantali of Gmelin, because their bill, arched like that of the Tantali, is nevertheless much more feeble, and with fewer notches at the point, whilst the nostrils, pierced towards the back of its base, are each prolonged into a furrow which continues to the tip. The bill, he adds, is rather thick, and nearly square at its base: there is always, he further remarks, some part of the head, or even of the neck, denuded of feathers. The external toes are notably palmated at their base, and the hind toe is sufficiently long to touch the earth. Some of the species, he observes, have the legs short and reticulated; these are the most robust and have the largest bill.

Of this genus Cuvier notices the following species:

T. Ibis (Ibis reigius, Cuv.); Abou Hannes, Bruce, pl. 35; Tantalus Atheneus, Lath. For the adult of this species he refers to Ossemens Fossiles, tom. i, pl. 1 and 2 (skeleton and perfect bird); and for the young to Savigny, Descrip. de l'Egypte, Hist. Nat. des Ois., pl. 7.

This, says Cuvier, is the most celebrated species; it was reared in the temples of antient Egypt, with veneration which approached to worship; and it was embalmed after its death, as some said, because it devoured the serpents which would otherwise have become dangerous to their country:—according to others, because there was a resemblance between its plumage and some of the phases of the moon: finally, according to other some, because its advent announced the rising of the Nile. For a long time it was thought that this species of the Egyptians was the Tantalus of Africa: we now know that it belongs to the genus of which we are treating. It is as large as a hen, with white plumage, except the end of the wing-feathers, which is black; the last coverts have their bars elongated, loose, with violet reflexes; and thus covering the end of the wings and tail. The bill and the feet are black, as well as all the naked part of the head and neck: this part is covered in youth, at least on its upper surface, with small blackish feathers. The species is found throughout the extent of Africa.

The other species noticed by Cuvier are—T. Ibis rouge (Scolopax ruber, Linn.; Tantalus ruber, Gm.) and T. Ibis vert, vulg. Courlis vert (Scolopaz falcinellus, Linn.).

(Régné Animal.)

The following is the description of T. Ibis vert (Ibis falcinellus),— Purpled chestnut, with deep green mantle. The young with the head and neck sprinkled with whitish. Locality: South of Europe and North of Africa. (Règne Animal.)

This, Cuvier observes, is to all appearance the species which the antients called the Black Ibis. (Abou-Hannes, vol. i, p. 38.)

The views of Mr. Vigors with regard to the position of Tantalus will be found in the article Herons, vol. xii, p. 165.

Mr. Swainson states that the Tantaliide, or Ibises, are large and very singular birds, living almost entirely on the swampy banks of rivers and fresh waters, rarely, if ever frequenting open and exposed shores, like the more typical waders. He observes that their habits and structure seem compounded of those belonging to the Herons on one side and to the Ruils (Rallide) on the other: their flight and size, he says, remind us of the former, while their long toes and insectivorous nature are more in unison with the latter. He traces their analogy to the Tenuirostris in the metallic colours of their plumage and in their having their heads frequently bare of feathers, as in the Ampelides and other tenirostris types. The majority, he remarks, live in tropical latitudes.

In the Synopsis the following characters of the family (which is placed between the Ardeide and Rallide) are given:—

Tantaliide.

Family Character.—Size large. Bill hard, considerably lengthened, cylindrical, and curved from the base. Face and head more or less naked. Hinder toe on the same plane as the others. Plumage metallic.

Genera.

Anastomus, Ill. Open beak. Bill straight, hard, heavy, solid, compressed, marked with longitudinal wrinkles. Upper mandible very straight; the base thickened at the top and as high as the crown; the tip notched; the side of the chin dentated: under mandible greatly curved upwards, and only touching the upper at the base and at the tip.

Example, Anastomus lamelligerus.

Tantalus, Linn. Bill nearly as thick as the base as the hind; cylindrical and acuminate towards the tips, which are slender and slightly bent: margins entire. Upper mandible notched. Nostrils naked, vertical, basal, oval-oblong. Toes connected at the base.

Example, Tantalus loculator.

Ouin, Antiqui. Bill much more slender; cylindrical, and arched from the base. Nostrils basal, lateral. Wings broad, ample: the second and third quills longest.

Example, Ibis ruber.
Aramus, Vieill. Bill lengthened, slightly curved toward the point, which is entire and inflexed. Under mandible curled from about the middle and angulated. Crown of the nostrils long, nostrils lateral, re-enter the base, longitudinal. Feet long. Hallux elevated. Anterior toes divided at their base. Wings moderate; the two first quills shorter than the third, which is the longest. America.

**Example, Aramus scolopacoides. (Classification of Birds.)**

The Prince of Canino places the Tantalidea between the Prodhidie and Scolopacidae, and arranges under the former the genera Tantalius and Ibis. (Birds of Europe and Asia—America.)

Mr. G. R. Gray makes the Tantalina the fifth and last subfamily of the Ardeidae, placing it next to the Cocintina, and arranging it under the following genera:


Mr. Gray gives the synonyms of all these genera. (List of Genera of Birds, 2nd edit.)


This species is 23 inches in length and 37 inalar extent. Bill 5 inches long, thick, and of a somewhat square form, slightly curved, bluntly bent downward and sharply ridged; black, except near the base, where it inclines to red. Iris dark-hazel. The face naked, slightly wrinkled, pale-red. Chin bare, wrinkled also. Plumage rich, glowing black, except at the third of the extremities of the four outer quill-feathers, which are deep steel-blue. Eyes pale red; the three anterior toes united by a membrane as far as the first joint. (Nuttall.)

This brilliant and exclusively American species, individual chiefly, is found in the tropics, abounding in the West India and Bahama Islands, and south of the equator, at least as far as Brazil. They migrate in the course of the summer (about July and August) into Florida, Alabama, Georgia, and South Carolina; but retire into the interior of the country when the approach of cool weather. They generally associate in numbers, frequenting the borders of the sea, and the banks and estuaries of neighbouring rivers, feeding on small fry, shellfish, crustacea, worms, and insects, which they collect at the edge of the tide. They are said to be in the habit of perching on trees in companies; but they lay their eggs, which are greenish, on the ground, amidst the tall grass of the marshes, on a slight nest of leaves. When just hatched, they are black, soon changing to grey, but are nearly white before they are able to fly; by degrees they attain their red plumage, which is not complete until the third year. The young and old associate in distinct bands. In the countries where they abound, they are regarded as plunder, and as objects of sport. The ibis shows great courage in attacking the fowls, and will even defend itself from the insidious attacks of the cat. It is generally esteemed as good food; and its rich and gaudy plumage is used by the Brazilians for various ornaments. (Manual of the Ornithology of the United States and of Canada.)

**TANTALITE.** [Columbium.]

**TANTALUM.** [Columbium.]

**TANTALUS.** [Nephrite.]

**TANSY’IP’TERA.** [Kingfishers, vol. xiii. p. 232.]

**TAORMINA.** [Messina; Taormenium.]

**TAOS.** [Mexican States.]

**TAP.** [Root.]

**TAPAJOS.** [Brazil.]

**TAPE WORM.** [Entozoa.]

**TAPESTRY.** (French, Tapiserie; Italian, Tappezzeria.)

This name is most commonly applied to the textile fabrics, usually of silk or linen, and sometimes of cotton, that are woven with various patterns, and are used for the manufacture of tapestries, and for the decoration of walls. It is derived from the French 'tapis,' which is from the Latin 'tapetum,' 'tapi'. *Tapetum* is the Latin word to which the same in the Greek 'tapes,' or 'tapis' (ταπεινός), which the Latin and Greek words signify a carpet or covering for a bed or couch. The French 'tapis,' though generally applied to carpets, is also used to express other figured cloths used as coverings, such as the coverings of tables; whence, most probably, we have the common expression 'on the tapis,' as applied to subjects under discussion or consideration. Of the use of the word *tapetum* in this more extended sense, there is an instance in Shakespeare's Comedy of Errors, act iv., sc. 1, where Antipholus of Ephesus sends to Adriana, informing her that

'The said carpets are of chintz and tapestries...'

In this more general sense the term is used by M. Achille Junius, in his recently published work entitled

"Recherches sur l'Usage et l'Origine des Tapisseries," in which he extends his inquiry to worked or figured cloths (tapisseries à ymaiges) used for many other purposes than the covering of walls. To this work we are indebted for much of the following information respecting the history of tapestry.

The early history of the art of producing figured fabrics by the loom may be more conveniently treated of under WAZTING than in this place; and it may be sufficient here to observe that in the earliest times by the Greeks and Romans for the production of ordinary tissues, its application to the weaving of ornamented or figured fabric was chiefly Oriental. It is probable also that many of the tissue-stuffs were embroidered by hand or worked with the needle. This kind of work, of which the Bayeaux tapestry is a celebrated example, was continued long after the practice of weaving tapestry in the loom had become common. The figured cloths of the twelfth to the sixteenth and even later centuries, and many of those produced in the twenty-sixth, thirty-fifth, and thirty-sixth centuries of Exodus, are generally considered to have been embroidered by the needle. Junius says that they were worked with a needle in thread of silk, gold, or wool, in such a manner that in imitation of the patterns designated by the gods, there were various patterns worked in colours by the loom, independent of those produced by the dyeing or printing process, and so richly composed that they vied with cloths embroidered by the needle. Junius quotes several ancient authors who refer to figured tissues as made and used by the Egyptians and other nations of antiquity.

Tapestry was used by the Babylonians to represent the mysteries of religion, and to perpetuate historical facts. The Materials of the Life of Alexander, and the Babylonian tapestry ornamented with silver and gold. The Greeks practised the art of embroiderying figures upon cloth, and attributed its invention to Minerva. Homer alludes, in several passages of the 'Iliad' and 'Odyssey,' to the embroidery of the paintings upon the binnal 'tapisseries à ymaiges,' among which he comprises even some articles of dress. Without attempting to pursue the investigation of this subject minutely, a general idea of the character of these or other figured tissues may be given by reference to the article Peplum in the Dictionary of Greek and Roman Antiquities, edited by Dr. Smith; the author of the article Peplum observes, that in all the productions of the loom, shawls were those upon which the whole art of embroidery, of all kinds, was exhibited, and that the subjects represented upon them were so various and tasteful, that poets delighted to describe them. He adds that 'Embroideries describes one which represents the sun, moon, and stars; and which, with various others containing hunting-
pieces and a great variety of subjects, belonged to the temple of Apollo at Delphi, and was used to form a magnum fundamentum, or the purpose of the temple. The word "bordeaux" (1141-1162) for it is to be observed that stores of shawls were not only kept by wealthy individuals (Homer, Odyssey, xx. 104-106), but often constituted a very important part of the treasures of a temple (Europides, Ion, 329, 330), having been presented to the divinity by such a number of individuals that it was necessary to court the favor of suppliants and devotees. (Homer, Iliad, vi., 271-304; Virgil, Aeneid, i., 490, Circe, 21-35.)

Several substances appear to have been used by the antients as materials for the ornamental fabrics alluded to in the foregoing paragraph. Gold thread was perhaps sometimes used in antient tapestry in the form of fine drawn wires, flattened and wound round threads in a manner resembling modern gold thread. Hebrew tapestries are engaged in working tapestry with the needle from the earliest epochs of the French monarchy. Gregory of Tours, writing towards the close of the sixth century, in his description of the rejoicings which followed the prostration of the Visigoths and the consecration of the streets being shaded with painted cloths or curtains (velis depictis), and the churches being adorned with hangings; and again, in describing the consecration of the church of St. Denis, he mentions tapestries embroidered with gold and garnished with pearls. The fabrication of tapestry-hangings by the loom appears to have been introduced into France, at the earliest, about the ninth century, until which time the needle had been used exclusively for this purpose. It has been supposed, however, that the two processes were practised concurrently. At this time we often find embroidered cloths enumerated among the decorations of churches. Jubaclnus quotes Fa
ter Labbe for the statement that many tapestries were made, and that of necessity in the eight century, and he relates that, about 985, there existed in the abbey of St. Florent, at Saumur, a great manufactury of stuffs, especially tapestries, which were woven by the inmates. From contemporary notices, it is evident that there was a celebrated manufactury of tapestry at Poitiers as early as 1026. Nor was the manufacture of tapestry confined to France at this period. The inhabitants of the north of Europe also practised it, and English embroidery was much admired and highly prized on the Continent. In the East also, where the art had been cultivated from the earliest antiquity, fine embroidery was produced in the eleventh century. Much of the early Oriental tapestry was adored with grotesque figures; and, long after it had become customary to depict natural figures and scenery upon tapestry, such devices were often used in ornamental borders.

In the twelfth and thirteenth centuries the use of tapestry extended greatly. It passed from churches and monasteries to dwellings of the nobility, and to the residences of the nobility. Accepting this change, Jubaclnus observes: "If, in the sthode of the cloister, the monks had, as we have seen, passed through a series of heresies and superstitions, ladies and their followers, shut up in their castles during the long evenings of winter, the tedium of which was interrupted only by the perusal of works of piety or chivalry, embroidered with their needles the glorious actions of our forefathers. The high walls of these cold rooms, built of stone, spoke far more effectually to the hearts and imaginations of those who lived under their roof in perfect quietude, than the counters of the learned historians, with important instruction, or with glorious reminiscences of the past, than when nothing appeared to veil their nakedness." The use of tapestry in this way was one of the luxuries introduced from the East in consequence of the intercourse of the Crusades. The Crusaders brought accounts of the Oriental practice of covering walls with prepared and ornamented skins, chiefly those of goats and sheep. These, which were probably at first used of their natural size and shape, were afterwards decorated with the most splendid ornaments, two feet high, and rather less in width, and united by sewing into very solid and handsome hangings, which were well adapted to resist damp. Such hangings, or tapestries, were used at Constantinople, Antwerp, and Cordova, and were sometimes either gilt all over, or ornamented with gilt devices, in which case they bore the name of d'or pondun. The Oriental origin of the more ordinary kind of tapestry is indicated by the name Saraceno or Sarazeno, which was frequently applied in France to the early manufacturers.

Numerous allusions to the use of tapestry in the fourteenth and fifteenth centuries, collected from contemporary documents, are given by Jubacln. It was then not only used to cover the cloister and chapel, but was also employed, on great occasions, as for instance on the public entries of princes, to decorate streets, and to impart a joyous appearance to towns and public places. In the fifteenth century, tapestry was used to ornament the galleries and other rooms required at tournaments. Rich embroidery was also much employed in the decorations of the horses and men who formed the actors in those chivalric amusements; and the brilliant, though often gaudy devices of heraldry, which formed so important a part of the display upon such occasions, afforded extensive employment to the workers of tapestry and other ornamented tissues.

The art of making tapestry, for which the Flemings had been celebrated since the thirteenth century, and which, made considerable progress in Flanders in the fourteenth century, and attained its highest perfection there in the fifteenth, Guicciardini has ascribed the invention of tapestry to Flanders; but, if received at all, this statement must be supposed to refer merely to such work as is produced by the loom. It is certain however that Europe is much indebted to the Flemings for the revival and improvement of tapestry, and for the production of many of the finest specimens which have been made; and that an interesting volume on 'The Art of Needlework' contains much information upon the subject of tapestry, is probably correct in assuming that the meaning of tapestry-hangings was not practised until they had become, from custom, a thing of necessity. Jubaclnus observes, 'had been the stitchery practised in the creation of these coveted luxuries, long, very long, before the loom was taught to give relief to the busy finger.' Tapestry manufactories were early established at Brussels, Antwerp, Oudenarde, Lisle, Tourmay, Bruges, and Valenciennes; but that of Arras was more celebrated than any other, and its productions were so highly prized, that the name arras became a common expression for the finest tapestry generally, whether made in that place or elsewhere. The hangings of Arras, as well as those of other manufactories in France, were, says Jubacln, for the most part executed in wool. Hemp and cotton were also used in them, but no silk or gold thread. The fabrication of tapestries formed of these materials was carried on chiefly at Florence and at Venice. The recollection of this difference is important in discovering where old tapestries were made, and Jubacln refers to instances of the difference in some of those engravers, in his statement, "that work was carried on chiefly at Florence and at Venice. Writing of the period under consideration he observes that the devices (nymages) of the tapestry were very various. We have seen that they sometimes represented scenes from ancient history, from the fabulous things of the Old Testament, and from the romances of chivalry; but the imagination of the tapestry-designers did not stop..."
the. The hangings of the fourteenth century often represented hunts, fantastic animals, or the occupations peculiar to the different regions of the year; and, besides being beautiful, they were also a means of collecting and cherishing the rarest and choice specimens of subjects for illustration. Joubinal quotes inventories of tapestries, receipts, &c., of the fourteenth century, in which tapestries of the above and of several other varieties are mentioned. The picture is not quite clear, but it is certain that in the reign of Charles V., France is particularly curious. It is taken from an inventory preserved in the Bibliothèque du Roi, which, besides tapestries ornamented with figures, mentions heraldic tapestries (tapissiers d'armoiries), and topizis (tapisseries de malles), and many similar documents, though Joubinal does not give them so fully. He gives however very long extracts from a MS. in the Bibliothèque du Roi respecting some old tapestries, from which it is evident that the names tapeziere Sarrazinos and tapa de Turqués were often applied to hangings fabricated in the West, they being probably made in imitation of Oriental work. In this epoch tapestry was often alluded to by poets, and it is attributed to the invention of thePKG of most of the tapestries to which the term 'tapisses historiées' has been applied.

The sixteenth century, which was an age of general improvement in France, gave a new impulse to the production of tapestry. Francis I. founded the manufactures of Fontainebleau, of which his brother Louis XII. was a skilful introducer of the work. It was, we are informed, with this new impulsion that the practice was commenced of weaving tapestry in a single piece, instead of in sections, as had been the practice before, of the smaller pieces being joined together. This prince brought Prismatico from Italy (Primaticcio, Francesco, vol. xix., p. 1), and, among other works of art, commissioned him to make designs for several tapestries, which were woven at Fontainebleau. Francis appeared no pains in the enlargement of this department of the fine arts. He engaged Flemish workmen, whom he supplied with silk, wool, and other materials, and paid liberally for their labour; and it was owing to these and also patronage of the tapestry-makers of Paris. Henry II., the son and successor of Francis, continued to encourage the manufacture at Fontainebleau, and established a manufacture of tapestry on the premises of the Hôtel de la Trinité, which attained its highest celebrity in the reign of Henry IV., and produced many fine tapestries. In 1594 Du Bourg, the most eminent artist connected with this establishment, made there the celebrated tapestries of St. Meri, which were in existence until a recent period; and these tapestries, so much in request, caused the French to re-establish the manufacture of tapestry at Paris, where it had been interrupted by the disorders of the preceding reigns. This he did in 1597, bringing Italian workers in great numbers into the work.

The narrative of M. Joubinal, from which most of the preceding facts are taken, does not extend later than the close of the sixteenth century; but, to continue the history of the tapestry manufacture in France without interruption, we may turn to the volumes recently published by the Countess of Wilton. A few years after the events last mentioned, as appears from his Memoirs, the Duc de Bussy, Henry's minister, was actively engaged in promoting this branch of industry. In 1603 he laid the foundations of new edifices for the tapestry- weavers, in the house-market at Paris; and at that time, or a little later, Flemish workmen were engaged to superintend the manufacture. The establishment languished, if it did not become quite extinct, after the death of Henry IV.; but when the royal palaces, especially the Louvre and the Tuileries, were receiving their rich decorations, in the reign of Louis XIV., his minister Colbert revived it, and from that time the celebrated royal tapestry-manufacture of the Gobelins was the most important in France. The Gobelins are one of those manufactures of which the Gobelins had been erected by celebrated dyers named Gobelin (Gobelin, vol. xli., p. 286), but which were purchased by Louis XIV. in or about the year 1666, and adapted to the requirements of the name of Hôtel Royal des Gobelins. Foreign artists and workmen were engaged, laws were drawn up for the protection and government of the manufacture, and everything was done to render it what it has ever since remained, the most celebrated of the kind in the world. The quantity of the finest and noblest works that have been produced by it, observes the work above referred to, and the number of the best workmen bred up therein, are incredible; and the present flourishing condition of the tapestries and manufacture of France is owing thereto. The production of tapestry at the Gobelins is said to have attained the highest perfection in the time of the minister Colbert and his successor M. de Louvois. Henry IV. paid great attention to the manufacture, made many designs for working after; and M. de Louvois caused tapestry to be made from some of the finest designs of Raphael, Julio Romano, and other Italian painters. A further account of this celebrated manufacture is given in a preceding volume which has just appeared under the title of 'The Hand-book of Needlework,' the authors of which write under her maiden name, Miss Lambert. She states that the manufacture declined greatly at the end of the reign of Louis XIV., but was revived under the government of Napoleon, and has ever since been carried on successfully, though by no means to the same extent as formerly. About 1802 ninety persons were employed in it, chiefly in preparing tapestry for the manufacture; and in 1820, according to the author of the work last named, 'are generally historical subjects, and it occasionally requires the labour of from two to six years to finish a single piece of tapestry.' The productions of this manufacture, says the same authority, which is entirely supported by what we have just said, are generally destined for the royal palaces, or for presents made by the king; but some few pieces, not designed as such, are allowed to be sold. Wool is the only material now used, it being found to retain its colour better than any other, and in connection with the weaving establishment is one for dyeing cloths, under the direction of able chemists, in which many colours are dyed for this purpose exclusively. From a passage in Evelyn's 'Diary' (Oct. 4, 1693), in which he speaks with admiration of some new French tapestries which he had seen in the apartments of the duchess of Portsmouth, it appears that the productions of this manufactory were known in England at that period.

The preceding historical notices respecting tapestries are only a summary of what we have given; for we must retract our steps to take a brief review of the use and manufacture of this kind of fabric in England. Respecting the Anglo-Saxon period, it is observed in the 'Pictorial History of England' (Hale, 1819, vol. ii., p. 332): 'The higher classes appear to have been completely and sometimes splendidly furnished: their walls were hung with silk richly embroidered with gold or colours. The needle-work for which the English ladies were so famous was often displayed to great advantage. Ingulphus mentions some hangings ornamented with golden birds in needle-work, and a veil or curtain on which was represented in embroidery the destruction of Troy. In the Anglo-Saxon poem of Beowulf we read that, in the 'great wine-cellar'—

> There hung vast works with gold and silver
> And on the walls
> Many wonderers to the sight
> That would gaze on it became wise.

'The Saxon term for a curtain or hanging was swawirt; and, in the will of Wynnfelda, we find the bequest of a long hollow swawirt and a short one. The same lady also bequeathed three coverings for benches or settles, 'three soft hangings,' which were placed in a corridor. Perhaps the most antient piece of needlework in existence. It was probably owing to the expense of such hangings, when of large size, and the very long time required for their manufacture, that the comfortable device of painting the walls of chambers with fictitious hangings was adopted in the early Norman period. Of this time the work before quoted observes (vol. i., p. 635):—'The hangings of needle-work and embroidery which adorned the walls of the Anglo-Saxon palaces, seem to have been partially superseded in the course of this period by the fashion of
painting on the walls themselves, or the wainscot of the chamber, the same historical or fabulous subjects which had hitherto been displayed in threads of colours and gold. Many instances might be enumerated of this kind of decoration, but it is sufficient to refer to the directions given by Henry III, early in his reign, for the painting of his wainscoted chamber in Winchester castle with the same pictures with which it had been previously adorned; a circumstance presumed by Walpole to indicate the very early extent of the art. During the first half of the fourteenth century, R. Wilt- 

ton states that tapestry of needle-work, like the Bayeux tapestry of Matilda, which had been used solely for the decoration of altars, or the embellishment of other portions of sacred edifices, on occasions of great solemnity, had been of much more general application among the luxurious inhabitants of the South, and was introduced into England as furniture hang- 
ing by Eleanor of Castile. That tapestry was not originally introduced by that queen, as is generally supposed; and we know not whether there is any further authority for the statement than the mention, by Matthew Paris, of her having used tapestry for covering floors, the word being apparently used in the sense of carpet (Pet. Hist. Eng. vol. i., p. 864). Tapestry of the saxon kind was 

mentioned as a 'tapestrier, in company with a 'webbe' and a 'dyen' among his Canterbury pilgrims; from which circumstance it may be presumed that the business was not a very uncommon one towards the close of the south 
east century, which century is sufficiently proved by the use of tapestry greatly extended in England; but then, and for long after, the principal supply appears to have been from the Con- 

tinent. In the sixteenth century a kind of hanging was introduced which held a place intermediate between wall and woven and embroidered tapestry. Shak- 

speare alludes to these hangings under the name of 'painted cloth.'* The appearance of the rich tapestry common in the English domestic art during that period, is admirably described by Spenser, in his Faerie Queene, book iii., canto ix., in the account of the tapestry seen by Britomart in the apartments of the house of Busiranse, in the following lines:—

For round about the walls ye lavish were

Weeping goves, with tears of joying

Woven with gold and silver close and fine,

The rings and chimes, in his just vicinity.

As falling to be hid from curious eye

As the love of loveliness, and the love of love,

This tuchy tuchy, as one unnatural;

Like a discordant note, whose tedious sound

Is as a long bright-horned book declarest.

The poet described what he was in the habit of seeing, and sufficient remains yet exist to attest the accuracy of his description; although in most cases the brilliancy of the metallic thread is too great, perhaps, for an admirable effect, and in some instances the gold and silver threads have been artfully withdrawn, their intrinsic value proving too strong a temptation for culpity to resist.

The introduction of tapestry-weaving into England is usually attributed to a woman named Sheldon, late in the reign of Henry VIII. Lady Wilton mentions indeed an intimation by Walpole of its origin as early as the time of Edward III.; but if any attempt was made to intro- 

duce the art at Woburn, it does not seem to have possessed any important result. According to her 'Art of Needlework,' Sheldon allowed an artist, named Robert 

Hicks, to use his manor-house at Burcheston, in Warwick- 

shire, for the practice of the art; and mentioned him in his will, which was dated 1270, as 'the only master in the art of tapestry and arras within this realme.' At Burcheston were worked in tapestry, on a large scale, maps of Oxfordshire, Worcestershire, Warwickshire, and Gloucestershire, some fragments of which are stated by Walpole's, early in the sixteenth century, to have been ornamented on Strawberry Hill. Little more is known of this establishment. James I. endeav- 

ored to revive the manufacture of tapestry by encourag- 

ing and assisting in the formation of an establishment at

Mortlake, about 1619, under the management of Sir Francis Crane. James I. gave 2000l. towards the forma- 

tion of this establishment, which appears to have been originally supplied with designs from abroad, but subse-

quently abandoned, and the first artist named Francis Cline, or Klein, a native of Rostock, in the duchy of Mecklenburg, who was engaged for the purpose. This undertaking was a favorite hobby both with James and his successor, who regarded Cleyne so favourably that he bestowed upon him, in 1625, the 'Manor-house of Rostock,' in the duchy of Mecklenburg, which he had enjoyed the use of till the civil war. In the same year Charles I. granted 3000l. a year for ten years to Sir Francis Crane, in lieu of an annual payment of 1000l. which he was expected to pay to King Henry VIII. for the receipt of grants recites, 'towards the furtherance, upholding, and maintenance of the works of tapesters, latelie brought into this our kingdom by the said Sir Francis Crane, and now by him and his workmen practised and put in use at Mortlake, in our countie of Surrey;' and of a further sum of 6000l. due to the establishment for three suits of gold tapestries. (Phedra, vol. xvii., p. 60.) After the death of Sir Francis Crane, his brother, Sir Richard, sold the premises to the king, and the manufacture ceased. After the Restoration, Charles II. endeavoured to revive the manufacture, and employed Verrio to make designs for it, but the attempt was unsuccess- 

ful. Lady Wilton however conceives that, although it was not a lasting success, the work was not altogether deserted, for which she observes, in Mr. Evelyn's very scarce tract entitled "Mandus Mabilibris," printed in 1690, some of this manufac- 

ture is amongst the articles to be furnished by a gallant 

to his mistress. During its period of prosperity, this manufac- 

ture was the most popular of all the arts; it was the most popular of all the arts, being used to hang the walls of the most splendid palaces, and the tapestry was 

used for the decoration of manor-houses, in the shape of hangings, as well as to other kinds of lining for rooms, perhaps suf- 

ficiently indicates the manner in which such decorations 

were formerly put up. 'The tapestries,' observes the Countess of Wilton, 'whether wrought or woven, did not remain on the walls, but were, the moment they were woven, the primitive office of grooms of the chamber to hang up the tapestry, which, in a royal progress, was sent forward with the purveyor and grooms of the chamber.' She relates a curious anecdote in illustration of this prac- 

tice. Henry IV. was the beauty of his time; he was always in his grandeur and splendour served by the state tapestries, and "the grooms of the chamber gave the tapestries before the pope's legate, the cardinal of Florence, when visiting St. Germain-en-Laye, sent orders to hang up the finest tapestry; but, by an awkward blunder, the suit selected for the cardinal's chamber was embellished with satirical emblems of the pope and the Roman court. The mistake was discovered by the Duc de Sully, on whose authority the anecdote is given, and another suit was substituted for that with the offensive devices. In a subsequent chapter, on "The Days of Queen Bess," the splendour and diversity of tapestry and similar decorations in the houses of the nobility and gentry of England, is stated that tapestry was at that time suspended upon frames, which were probably, in many cases, at a considerable distance from the walls, as we frequently see, if we attempt to hang them themselves, like Falstaff (Merry Wives of Windsor, act iii., scene 3), 'behind the arras.'

The interest attached to antique tapestries as historical monuments, as descriptive of the changes in the art, is a subject of too mean order. The most important work on this de- 

partment of archaeology is that of J. Joubinal, the author of the historical treatise quoted in the former part of this article, entitled 'Les Anciennes Tapisseries Historiques,' a work which is given in a volume of six large folio plates, of the most remarkable tapestries made from the eleventh to the sixteenth century, and preserved to the present time. Such monuments, as he observes in his preface, sometimes represent to us, with a charming and

* In Malone's edition (1851) many references to this kind of substitute for needlework or embroidered patterns by various authors, are given. See also W. J. H.; also "As you like it," Act iii. S. (vol. vi., pp. 434-61), and Henry IV., Part 2, Act v., Scene 6. (vol. ii., p. 84). From the latter passage it will appear that the hangings alluded to were sometimes painted in water-colours.
faithful naiete, grave historical events, and sometimes scenes of gaiety. 'There they show us a siege or a tournament; here, a feast; a little further, a chase; and always, whether chase, banquet, tournament, or siege, all is, as Montaigne would have said, poured away to the life; they all retrace to us most literally the mode of life of our fathers, showing us their residences, their churches, their dresses, their arms, and even (thanks to their explanatory legends) their different weapons. In such a fashion of things, if we refer to the inventory of Charles V., made in 1579, we find that all the French literature of the fruitful ages preceding the era of that wise monarch had been by his orders translated into wool. At a later period, although tapestries were as early as the fourteenth and fifteenth centuries; the only essential difference between these and the productions of modern times being that previously noticed, the comparative size of the pieces worked in the loom. The weaving of tapestry, being a process of an entirely different character, is like the base line, appears to be of Oriental invention; and the difference between the two methods may be briefly described. In the base line the loom, or rather, the frame with the warp-threads, is placed in a perpendicular position, and the weaver works standing; while in the base line the frame with the warp is laid horizontally, and the weaver works in a sitting position. In weaving with the base line, which, Miss Lambert observes, is now relinquished, the painting of the back is done. Beneath the warp-threads are stretched in a manner resembling that of common weaving, the pattern being supported by a number of transverse threads stretched beneath it. The weaver, sitting before the loom, and leaning over the beam, carefully observing the pattern on the back of the warp, he may see his pattern between them. He then takes in his other hand a kind of shuttle, called a filote, charged with silk or wool of the colour required, and passes it between the threads, after separating them in the usual way by means of treddles worked by the feet.

Weaving.] The thread of wool or shoot thus inserted is finally driven close up to the finished portion of the work by means of a reed or comb formed of box-wood or ivory, the latter being preferable. In this way the threads between the warp. In this process the face of the tapestry is downwards, so that the weaver cannot examine his work until the piece is completed and removed from the loom. The frame of the base line loom consists of two upper side-pieces, with large rollers placed horizontally between them. The threads of the warp, which usually consist of twisted wool, are wound round the upper roller, and the finished web is rolled round the lower one. The cartoon, or drawing, is drawn on paper (or occasionally by the back or wrong side of the warp, and then the principal outlines of the pattern are drawn upon the front of the warp, the threads of which are so finely open to allow the artist to see the design between them. The cartoon is then placed under the loom, so that the weaver may place himself between them with his back towards the former, so that he must turn round whenever he wishes to look at it. Attached to the upper side-pieces of the frame are contrivances for separating the threads of the warp, so as to allow the filote, or broach, which carries the wool, to pass between them. Like the weaver with the base line, the operator works, as it were, blindfold; but by walking round to the front of the loom, the weaver may see the progress of his work, and may adjust any threads, which have not been forced into their right position by the reed or comb, with a large needle, called a miggule de presseu. The process of working with the base line is exactly the same with that of the base line.' Now, however, the pieces are woven so wide that joining is very seldom reported even for the largest works.

Weaving."

(Jubinal, Recherches sur l'Usage et l'Origine des Tapisseries à Personnages, dites Historiettes; The Art of Needlework, edited by the Right Honourable the Countess of Wilton; The Handbook of Needlework, by Miss Lambert; &c.)

TAPHOZOUS. [Chiroptera, vol. vii., p. 24.]

TAPIOCA, a farinaceous substance, prepared in South America from two species of Manihot, or the bitter and sweet Cassava or Manioc plants, which were long regarded as the chief species, but which, it is now known, the natives of America, call the bitter Manihot utilisima, and the sweet Manihot Alpi (Pohl, Pl. Brasil., t. 1. 32. t. 24. The name of the last plant is, however, rather incorrectly given as Manihot species, which is probably owing to the greater facility with which it can be ground and rapped into flour, owing to the absence of the ligneous centre. The poisonous principle of the bitter manioc is thought to be of the nature of hydrocyanic acid, which is found in so many of the plants of the 3ème ed.) It is easily disintegrated or decomposed by heat or fermentation; hence the flour becomes perfectly wholesome in the process of baking the cassava bread. [Cassava, vi. 344.] The juice, after expression, may be inspissated by long boiling, or formed into a soup, with flour and spices, called cassarepo. By means of molasses it can be fermented and converted into intoxicating drink.

The fecula, or flour, after the juice has been carefully removed, is brought to the state of a paste, and in this state, is employed in the manufacture of tapioca. In this it is very necessary to distinguish it from an artificial tapioca made with gum and potato starch, which is in larger granules, white, and is not so broken, and more soluble in cold water than the genuine.

TAPIR, Tapirus, the name of a genus of pachydermatous quadrupeds.

Linnæus does not notice the Tapir in the 12th ed. of his Systema Naturæ; but Gmelin quotes it as the Hippopotamus (terræcis) pedibus subulatis. (Syst. Nat. x. i. p. 74. n. 2.)

Gmelin introduces it under the title Tapir, between Horses and Swine.

Cuvier regards the genus as the last of his Pachydermæ Ordinaires, making it immediately succeed the extinct Palæotheria and Lophiodons. The genus was well known to the older zoologists who wrote on the natural products of America, as we shall hereafter see.

Organisation.

Skeletum. When viewed in profile, the pyramidal elevation of the skull of the Tapir, calling to mind what is to
be seen in the hog, strikes the observer forcibly. But the pyramid of the Tapir differs from that of the hog in having only three faces; and also in this, that its anterior line is formed by the meeting of the lateral faces, and it is only towards the front that it is dilated into a triangle, which is due to the frontal bones; these are early united and directed a little backwards. At the middle of the base of this triangle, to which the bones of the nose are articulated, is a point which penetrates between them; and from the two sides above the orbits descends a deep furrow produced by the structure of the upper border of the orbit, and which approaches towards the suborbital hole: it serves for the supporting part of the orbit. The orbital border is separated from the frontal by a well-marked suture, and has the postorbital apophyses but little marked.

That part of the cranium which is in the temporal fossa is known as the sphenoid bone. The occipit is a small semi-oval extremely concave plate, because the occipital crest projects considerably backwards in a parabolic shape. The occipital bone ascends on the cranium. The frontal bones descend in a plane there, the half of the inconstant, the palatine, the two sphenoids, and the temporal bone. The parietals are square, very large, occupying a great portion of the sagittal crest, and united also early between them. The nasal bones are no less striking: these form the root of the nose, and are connected with the frontal by the jugal and by the septum which separates them.

The nose forms an osseous septum, and its cavity is occupied by the nasal, maxillary, ethmoid, and vomer bones. The maxillary are square, very large, occupying a great portion of the sagittal crest, and united also early between them. The nasal bones are no less striking: these form the root of the nose, and are connected with the frontal by the jugal and by the septum which separates them. The sphenoid bone is formed of two plates, one of which descends lower than the mid-height of the head, is very wide, and has the postorbital apophyses but little marked.

The occipital bone is composed of five bones: its anterior portion is compressed, and projects in the form of a ploughshare. There are four lumbar vertebrae, the transverse apophyses of which are large; those of the last, which are rather shorter and oblique, are articulated with the first sacral vertebra. These transverse apophyses have on their base the same elevated crests as the dorsals have for articulation with the ribs.

The sphenoid is in the adult consists of seven vertebrae, the spinous apophyses of which are distinct and inclined backwards; the five last of these apophyses are short and terminate by a widened disk. The tail has seven vertebrae.

**Bones of the Extremities.**—The blade-bone has a strong semicircular notch towards the lower part of its anterior border; the rest of this border is round as well as the upper border: the posterior border makes an angle upwards and then descends a little concave. There is neither a combination nor composition of the blood-vessels excepted. The spine of the bone terminates at the lower third of it, its greatest projection is at its middle; the articular surface is oval and higher than it is long. This
blade-bone, says Cuvier, emphatically, and not more emphatically than truly, cannot be confounded with that of any other animal.

The head of the humerus is powerful, behind the axis of the bone. Its large tuberosity is bilobated by a rounded notch; its bicapital canal is simple and not wide; the edge is little marked; the condyles do not project much. The radial articular face is divided by a projecting rib into an entire pulley on the internal side, and the half of one on the external side; both the one and the other correspond to projections of the radius, so that this last has no rotation. It is even probable, observes Cuvier, that with age it is anchylosed to the ulna, which remains throughout its length on the external edge of the arm. The upper head of the radius is nearly rectangular; its body, rounded in front, is flattened behind. The body of the ulna is triangular. One of its crests follows the external crest of the radius.

Skeleton of American Tapir.

The carpus of the Tapir bears a near resemblance to that of the Rhinoceros, especially in having, like it, a single small bone articulated with the wedge-shaped and unciform bones, in lieu of the trapezoid and thumb; but this bone is articulated with the metatarsal bone of the index, which is not the case in the rhinoceros. The other bones of the wrist are nearly of the same form, excepting that their width is less in proportion to their height, a condition which is true even with regard to the unciform bone, although it has to carry two complete metacarpals, whilst in the rhinoceros it only carries one and the vestige of another. The pisiform bone is also longer in proportion in the Tapir. The metacarpal of the middle finger is longest and straightest; those of the index and ring-finger are curved nearly symmetrically one with reference to the other, as in the rhinoceros. But the Tapir has also one small, short, and rather irregular metacarpal. The three first fingers are those which touch the earth, and their ungual phalanges resemble those of the rhinoceros; the little finger does not touch the ground. The first phalanges are longer than they are wide, but the contrary is the case with regard to the second.

The widened part of the osa illi is very broad transversely, and a little concave outwards. The external edge of this bone is longer than the internal one: the anterior border is largely concave, and the two spines are, as it were, truncated; its neck is narrow, with reference to its length; the oval holes are longer than they are wide, and the posterior extremity of the ischium terminates in a point very distant from its correspondent. The anterior passage of the pelvis is as long as it is wide, and nearly circular.

The femur has its great trochanter pointed, forming a projection backwards, and giving off a rib which descends along the external border. Besides the two ordinary trochanters, there is a third, which is flattened and recurved in front. In these points its resemblance to that of the bone is perceptible, but it differs much in having the two borders of the rotular pulley nearly equal. The fibula is curved outwards, which separates it a little from the tibia: this last has its upper head rather marked, but the tuberosity which terminates this end above is obtuse and curved but little. Its lower head is wider than it is long, is oblique, and its antero-posterior diameter on the internal side is wider, and this border more projecting than that of the fibular side.

The tarsus of the Tapir is still better modelled than its carpus after that of the rhinoceros, of which it seems to be only a repetition: only the os calcis is much more elongated and more compressed; but its facets are the same. The neck of the astragalus is longer and touches the cuboid bone by a narrower facet. There is no vestige of a hind toe, but the little finger is represented by an elongated bone, bent at the end, articulated to the scaphoid, to the small cuneiform and the external metatarsal bones. The posterior tubercle of the cuboid bone is less projecting and less hooked than in the rhinoceros. (Ostea Fossilis.)

Cuvier, in his osteological comparison of the Indian Tapir with the American form, observes that a glance at the profile of their respective crania is sufficient to impress upon the observer their specific differences. The forehead of the Indian Tapir is, he observes, so convex, that it rises higher than the occiput; it elevates in its rise the nasal bones, which much prolongs the ascending part of the jaws and the descending portion of the frontal bones along the external aperture of the bony nostrils, thus giving much wider room for the comparatively large proboscis, and adding length to the furrows where the muscles are inserted. This organization, he observes, explains why the Indian Tapir has a more powerful and extensible trunk than that of America. There is even, he adds, in the Indian species, on the base of the nasal bones at their junction with the frontal bones, and on each side, a deep fossa which does not exist in the other species. This elevation of the forehead is accompanied by a depression of the occipital crest, which, far from forming a pyramid, as in the American species, rather descends backwards. The aperture of the bony nostrils, so enlarged by the prolongation of the maxillary bones, terminates below and forwards by more elevated intermaxillaries, which are for the rest anchylosed together in early youth as in the American Tapir.

The interval between the canine and the first molar is less in proportion in the Indian Tapir, whose dentition is otherwise the same with that of the American species.

The zygomatic apophysis of the Indian species is a little higher backward and less forward: its mastoid apophysis is more transversally turned.
The occipital surface of the skull offers a difference corresponding to that of the profile, inasmuch as it is much lower, but it is also much wider in proportion; and from this width results another difference in the upper surface of the brain, namely, the pointed angles remaining throughout its length linear and narrow, widens much backwards, and even remains rather wide at the point where it is most narrowed by the approximation of the two temporal fossae. The triangle which these two fossae leave in front upon the frontal bones is also wider and its surface more convex. The triangle formed by the true bones of the nose is wider at its base. For the rest, the composition of the cranium, the connexion of its bones, their size and form, as well as the teeth, those of the American species, are the same.

Cuvier remarks that the rest of the skeleton of the two species does not offer much appreciable differences. The blade-bone of the Indian species is rather the wider; but the notch towards the lower part is smaller and rounder. The anterior hook of the great tuberosity of the humerus is more projecting; the umbilicus bone of the corpus is narrower; the last phalanges of the middle anterior toe are wider and more rounded, and the same may be said of the middle toe of the hind feet; the great trochanter of the femur is larger; the neck of the astraglus is shorter; but all these differences, Cuvier observes, are of so little importance, that, without those of the cranials, they would hardly justify the conclusion of specific distinction.

(Quesnois Fossiles.)

Mr. Yarrell, in the 4th vol. of the Zoological Journal, gives an account of a post-mortem appearance in an American Tapir brought to this country by Lieut. Maw, R.N., which, in spite of its arrival in the garden of the Zoological Society in the Regent's Park only a few hours.

When dead, the animal, which was said to be about twelve months old, measured from the nose to the root of the tail 48 inches, and its girth was 36 inches. The inferior teeth \( \frac{3}{5} \) were very much used; the edges coming into close contact when the molars are in action. The canines 1-1 were small in the upper jaw, and removed a short distance from the lateral incisor, for the admission of the larger canines of the lower jaw; the molars were 4-4. Of those in the lower jaw, the first had three lobes, with five points; the second and third two lobes, with four points. Of the four upper molars, the first had two outer and four inner points; the second and third had each with four points: all the parallel points or tubercles were connected transversely by a slight triangular ridge; and each of these triangular ridges, with their connected tubercles, shut into similarly shaped cavities in the teeth opposed to them, at the point of the genitals, so as to form continuous surfaces. The second, third, and fourth upper molars had each a small additional but less elevated point on the external anterior angle, increasing somewhat in size from the second tooth backwards. On cutting through the bones of the palate in order to the complete removal of the brain, Mr. Yarrell found the crown of another molar tooth on each side, posterior to, and somewhat within the line of range of, the last exposed molar.

The cartilage of the septum nasium was thick and strong, and the central ridge of the skull very much elevated. The lamina nuchalis was composed of three strong conical portions, two of which, passing in a parallel direction from the elongated spinous process of the first vertebra, were inserted together upon the extreme superi- or posterior angle of the central ridge of the cranium, supporting the whole length of the elevated crest and mass of the integument. The sinuses pyriformes passed between the other two, and was inserted into the elevated portion of the elongated spinous process of the dens.

The anterior portion of the sternum was keel-like and rounded in shape, and projected forwards. There were twenty ribs on each side and four lumbar vertebrae. The external cartilages were firm: the ribs however were incomplete throughout. One large and one small lobe formed the right lung; one large and two small ones the left: they were inflamed. The pericardium, which was loaded with fat, was of unusual thickness; but the heart presented nothing remarkable: the coats of the arteries were particularly thick and firm. The esophagus was narrow, the stomach presented a single cavity, rather small, measuring, when moderately distended with air, 8 inches only from right to left, and 15 inches in circumference: the parieties were thickened about the pylorus, but the internal surface was not examined, the organ having been preserved entire: it contained a loose mass of tow, hair, string, and shreds of cloth. The spleen was narrow, thin, and 12 inches long.

The liver was divided into four lobes:—two, one large and one small, on the right side; and two, one large and one small, on the left; the lower of these last was divided and notched on the edge. There was no gall-bladder.

The small intestines, uniform in size throughout their length, measured 21 feet, and were inflamed.

The cecum was capacious compared with the stomach, measuring 14 inches in the line of its long axis, and 5 inches in girth at the largest part, and had two deep and several smaller circular indentations externally, and were marked with one small and one large point on the external surface; tapering somewhat to a point at its closed extremity, but without any appendix veriformis. The colon, at two feet from its commencement, doubled suddenly upon itself, and formed a fold at the bottom; the inner surfaces of which were closely connected. The large intestines measured seven feet in length.

The sexual organs (the animal was a female) presented about the uterus, its cornus, and the ovaria, a degree of vascularity which was, however, not so great that the period of life was approaching when breeding would have commenced.

Mr. Yarrell refers to Sir Everard Home’s paper in Phil. Trans. (1821), in which Sir Everard points out the differences existing in the Sumatran and American Tapirs, and has described a part of the visera of the former. In the Sumatran Tapir the stomach is large, the intestinal canal very long, and the cecum small; in the American Tapir the stomach is small, the intestines of moderate length, and the cecum large.

Mr. Yarrell adds, that, of the species described, the length of the Sumatran Tapir is eight feet; and the whole length of its intestinal canal 29 feet. Proportion, as 7 to 1.

The length of the American Tapir is four feet; and the whole length of its intestinal canal 29 feet. Proportion, as 11 to 1.

No. 1217 of the same series is a section of the kidney of a Tapir (Tapir Americanus), with the arteries injected, and the pelvis laid open to show the terminations of the tubuli uriniferi, as in the horse. No. 1286 is the supraprenal gland, with a section of the artery. No. 2323, in American Tapir, a part of the kidney, showing a dark-coloured substance very distinctly. No. 2778 exhibits part of the vagina, with the urethro-sexual canal, vulva, and etiloris of the American Tapir, in which the etilors projects within the anterior margin of the vulva: it is a short pyramidal body with two small lateral processes. The etiorphic, sexual canal is separated from the vagina by a broad transverse semilunar fold, beneath which is the wide aperture of the urethra. No. 2522 B. is the distal extremity of the penis of the Sumatran Tapir. The upper and lateral borders of the base of the glans are indented by a little round hollow, the acumen, or the extremity of the clitoris, and the parallel linear borders, beyond which the extremity of the glans is continued forwards, and terminates in a large truncate slightly convex surface, in the middle of which is situated the orifice of the urethra.

Generic Character.—Molars presenting on their crown before they are worn, two transverse and rectilinear tuber- cles (collines). Nose terminated in a small moveable pro- boscis, but not terminated with an organ of touch like that...
of the elephant; neck rather long; skin rather thick, and covered with hair, looking as if it had been close shorn; two inguinal mammae. Anterior feet with four toes; posterior feet with three toes.

Dental formula:—incisors 6 1 1 1; canines 6—6—6; molars 7—7—7

=42.

**Asiatic Tapir.**

**Geographical Distribution.**—Asia and America. M. Lesson observes that it was for a long time believed that this genus was peculiar to America; but that the rich and beautiful discoveries of MM. Diard and Duvaucel have proved that it is also proper to Asia: of which observation more will presently be said.

**Asiatic Tapir.**

Up to the year 1816 it appears to have been thought that the Tapir form was confined to America, and the species known in collections as the American Tapir seems to have been regarded as the only example of the genus. M. Lesson, who so sweepingly claims the discovery of the Asiatic species for French naturalists, is not the only zoologist of that country who puts forth such pretensions. Mr. Bennett has thus corrected those pretensions:

Some vague notices had reached Sir Stamford Raffles of the existence of a similar animal in Sumatra and the Malay Peninsula; but to Major Farquhar belongs the credit of having first procured a specimen and submitted its description to the world at large. The history of this transaction affords too striking an illustration of the injustice of certain among the French zoologists to the merits of our countrymen to be passed over without observation. "The knowledge of this animal in France," says M. Desmarest, in his Mammalogie, "carefully shielding himself under an equivocal form of expression, "is due to M. Diard." But M. Lesson goes farther; and echoing, as usual, the dicta of his predecessor with a slight addition of his own, speaks of the Indian tapir as a species "discovered by M. Diard." Again, in the 'Dictionnaire des Sciences Naturelles,' M. Desmarest, forgetful of his former caution, heightens the force still more by asserting that its "discovery in the forests of Sumatra and the Peninsula of Malacca is due to MM. Duvaucel and Diard." In none of these works is the least indication given that the animal in question had previously been even seen by an Englishman; much less is the fact suffered to transpire that one before M. Diard had "discovered" it, not in the forests of Sumatra, but in the Malay Peninsula. The Malayan Tapir, a full description, together with a figure of the animal and of its skull, had been laid before the Asiatic Society by Major Farquhar, for publication in their 'Researches.' Thus, in passing circumstance, it is true, was an observation by M. Frederick Cuvier when he figured the tapir of Malacca in his splendid work, from a drawing made by M. Daudin in the Barackpore menagerie, or by that gentleman himself in the published part of his accompanying letter; but there seems to have been no intention on the part of his accompanying letter; but there seems to have been no intention on the part of his correspondents to mislead their readers. That M. Diard at last could not have been actuated by any such desire as is full proved by several passages in the note appended by him to Major Farquhar's original description, in which he speaks of the gallant officer as the "excellent naturalist who has enriched zoology with so important a discovery;" and attributes the "honour" to him "alone." Baron Cuvier too, in the recent edition of his 'Regne Animal,' solemnly rejects the unmerited distinction in favor of his degree and friend; and candidly quotes, as the first description, our, in this instance, more fortunate countryman. After this, we trust that we shall hear no more of the "discovery" of the Indian tapir by MM. Diard and Duvaucel, who have too many real claims on the consideration of zoologists to require to be tricked out in the borrowed plumes with which it has hitherto been the fashion among our neighbours to invest them. ('The Gardens and Menagerie of the Zoological Society delineated, vol. iii.')

Dr. Horsfield states that the first intelligence of the existence of this interesting animal in Sumatra was given to the government of Port Marlborough at Bencoolen, in the year 1772, by Mr. Whalfieldt, who was employed as a mercantile agent along the coast. In the year 1772, it is, according to Dr. Horsfield, noticed in the records, that Whalfieldt laid before the government his observations on the places sou thward of Cawor, where he had observed the tapir at the mouth of a river. He considered it to be the hippopotamus, and described it by that name; but the drawing which accompanied the report identifies it, says the Doctor, with the tapir. Dr. Horsfield adds that this mistake in the name may readily be explained, when it is recollected that in the tenth edition of the 'Systema Naturae' of Linnaeus the tapir placed as a species of hippopotamus, while in the twelfth edition no mention is made of that animal.

The learned author of the 'History of Zoology,' William Jevons, in his 'Abridgment of Dr. Horsfield,' was at that time secretary to the government at Bencoolen; and the public owes to his zeal in collecting every valuable information relating to that island the first notice of the existence of this animal, which is by the Malays in many places denominated Kuda-auger, literally hippopotamus. After the first discovery, in 1772, the tapir was not observed for a considerable period. From the same catalogue of Sir T.S. Raffles which has furnished the description, it appears that in the year 1825 a living specimen was sent to Sir George Leith, when lieutenant-governor of Penang. It was afterwards observed by Major Farquhar in the vicinity of Malacca. A drawing and description of it was communicated to him by the Asiatic Society in 1826, and a living subject was afterwards sent to the menagerie at Barackpore from Bencoolen. At this place a drawing was made by M. Diard in the year 1818, which, accompanied by an extract from the description of Major Farquhar, was communicated to his friends in Paris, where, in March, 1819, M. Fred. Cuvier published it in his large lithographic work on the mammalia of the menagerie at Paris.

In the month of September, 1830, the first specimen of the Malayan tapir was received in England from Sir Thomas Stamford Raffles, with the general zoological collection of mammals and birds, the descriptive catalogue of which, being contained in the 13th vol. of the 'Transactions of the Linnean Society,' has been already referred to. The bones of tapir were prepared by a complete skeleton, and the thoracic and abdominal viscera preserved in spirits of wine. Dr. Horsfield then refers to the use made by Sir Everard Home of these materials in the paper above alluded to.  

* Calling him "Pithsimas" answer.
A living specimen of this species was lately brought to this country, and publicly exhibited in the garden of the Zoological Society of London, where it died more than a year ago.

Description of Tapirus Malyanus—Tapirus Indicus of the French zoologiste; Le Maitre, F. Cuv., Mamm.:—‘The Malay Tapir resembles in form the American, and has a similar flexible proboscis, which is six or eight inches in length. Its general appearance is heavy and massive, somewhat resembling the hog. The eyes are small; the ears rounded, and bordered with white. The skin is thick and firm, thinly covered with short hair. There is no mane on the neck, as in the American species. The tail is very short, and almost destitute of hair. The legs are short and stout; the fore-feet furnished with four toes, the hind-feet with three. In the upper jaw there are seven molars on each side, one small canine inserted exactly on the suture of the incisor bone, and in front six incisors, the two outer of which are elongated into tusks. In the under jaw there are but six molars; the canines are large; and the number of the incisors, the outer of which are the smallest, is the same as in the upper jaw. The general colour is glossy black, with the exception of the back, rump, and sides of the belly, which are white, and separated by a defined line from the parts that are black.’

Schenk in the description of Sir Stamford Raffles, for the accuracy of which we can vouch, having compared it with the living animal in the garden of the Zoological Society, Major Farquhar describes a young Tapir of this species which he had alive in his house thus:—‘It appears that until the age of four months it is black, and beautifully marked with spots and stripes of a fawn colour above and white below. After that period it began to change colour, the spots disappeared, and at the age of six months it had become of the usual colour of the adult.’ (See post, American Tapirs.)

Marsden, as we have already seen, notices the animal as the Hippopotamus; caddo-aiger. In Sumatra, according to Sir Stamford Raffles, it is known by different names in different parts of the country; thus by the people of Liman it is called Saladang; by those of the interior of Manna, Gindol; in the interior of Bengcoole, Babu Ali; and at Malacca, Tenmu.

Habits.—The habits of this species in a state of nature are probably similar to those of the American Tapirs. In captivity, Major Farquhar describes it as of a mild and gentle disposition. ‘It became as tame and familiar as a dog; fed indiscriminately on all kinds of vegetables, and was very fond of attending at table to receive bread, cakes, or the like.’ Sir Stamford Raffles adds that the living specimen sent from Bengcoole to Bengal was young, and became very tractable. It was allowed to roam occasionally in the park at Barrackpore, and the man who had charge of it informed Sir Stamford that it frequently entered the ponds, and appeared to walk along the bottom under water, and not to make any attempt to swim. Sir Stamford also states that the flesh is eaten by the natives of Sumatra.

The individual exhibited in the Regent’s Park was very mild and gentle.
that gathered about the history of this animal began to clear away before the lights of observation. Buffon had noticed the only American Tapir then known, as the largest animal of the New World; but this can hardly be said of it when the Elk and the Wapiti are remembered. Geoffrey St. Hilaire and Baron Cuvier first accurately defined its zoological characters; and Sonnini and D'Azara gave a correct account of its habits. Buffon's figure, after a drawing by Daubenton, was the first at all approaching to accuracy. A living individual was afterwards brought to France, but died before its arrival at Paris, and furnished a still better design, published with further information, derived chiefly from the memoir on the systematic characters of the species, in the Supplement to Buffon, vol. vi.: but still some of the errors were retained; nor was the account of two other individuals living in the menagerie belonging to the Prince of Orange, by Allamand, complete.

Liet. Maw, in his Journal of a Passage from the Pacific to the Atlantic (1829), speaks of the Tapir as common in the woods and rivers about Egas, there called Anta, and which is the same animal with the Sachywaka, Dante, or Gran Bestia of Peru, of which they had heard much both before and since embarking. Two kinds were described to them, one having the tips of its ears white, and which is the largest: when young it was stated to be something like a deer, but disappears as it grows older, till it becomes entirely of a dusky bay colour. Here we have a clear intimation of the knowledge of two species by those inhabiting the spot.

The form of the species best known has since been rendered Englishman by Mr. Roulin, who had collected a number of living specimens in the gardens of the Zoological Society of London in the Regents Park.

But this is not the only American Tapir; for M. Roulin, about thirteen years since, laid before the French Academy a description of a figure of a new species inhabiting the mountainous parts of the same district, the plains of which are frequented by the other; and his account is given in the Annales des Sciences Naturelles: from this it would seem that the American Tapir of both mountains is as nearly allied to the Asiatic species than the American Tapir of the plains.

We take as our example the species first known, Tapir americanus, Gmel.

Description. General colour throughout deep brown approaching to black. Sides of the lower lip, band on the under and middle part of the chin, upper edges of the ears, and naked line at the junction of the hoofs pure white. Scanty hair of the body very short, closely adhering, and the woolly hair distinguishable at a small distance. The skin beneath is of great density, being, according to M. Roulin, not less than seven lines thick on the back, and eight or nine lines on the cheek, and so thickly covered that it is frequently shown to a female when crossing the river with her young, without disturbing her or making her turn out of her course, though he saw the impression of a ball which he had fired on the animal's cheek. There is a thick rounded crest on the back of the neck, extending from the forehead as low as the level of the eyes to the shoulders, and bristled with a not thick mane of stiff blackish hairs. Mr. Bennett remarks that it is peculiar to the present species, but is not found, according to M. Roulin, in the female. M. Roulin, in the female also, states that it is equally furnished with it in Paraguay. In the female brought by Liet. Maw from Paraguay, and formerly in the menagerie of the Zoological Society of London, it was very conspicuous. Head very long; muzzle prolonged and covered above with hair of the same colour as that of the body, but naked and flesh-coloured at its extremity (which is flattened) and underneath. Eyes very small, of a dull lead colour.

The general pelage is tinted by Mr. Yarrell rusty reddish-brown, with indications of lighter spots and horizontal lines on the ribs, flanks, and thighs. 'These fawn-coloured spots and stripes,' says Mr. Yarrell, 'are common to both species of Tapir' (the Sumatran and the American Tapir). 'These spots and stripes are not defined by the species (the pink or the American); it results from the habits of the species, and from the fact that it is necessary to distinguish them from the Sumatran Tapir by the indications of the species of pink alone.' (Zool. Journ., vol. iv.)

Mr. Bennett, too, remarks that the young is of a much lighter brown than the adult, with numerous small white spots on the cheeks, a whitish muzzle, and six or eight complete narrow bands of white passing along each side of the body. The form of the coat, and the white of the fur, is that of a tapir. 'The hairs on the upper parts of the body are longer and more numerous than on the under parts, and are colourless, while those on the latter place are tinged with pink, so that beneath the under parts the coat is of a reddish-brown colour. 'The undersides of the limbs and the under part of the tail are of a pinkish colour. 'The under parts of the head and the lower part of the neck are usually of a reddish-brown colour. 'The lower parts of the legs are covered with a thick mane, forming a band on the lower part of the chin and the lower part of the neck which is more conspicuous than the upper part. 'The ears are large, and covered with a thick mane, forming a band on the lower part of the neck which is more conspicuous than the upper part.' (Zool. Journ., vol. iv.)

Mr. Bennett, too, remarks that the young is of a much more pronounced pinkish white than the adult, with numerous small white spots on the cheeks, a whitish muzzle, and six or eight complete narrow bands of white passing along each side of the body. The form of the coat, and the white of the fur, is that of a tapir. 'The hairs on the upper parts of the body are longer and more numerous than on the under parts, and are colourless, while those on the latter part are tinged with pink, so that beneath the under parts the coat is of a reddish-brown colour. 'The undersides of the limbs and the under part of the tail are of a pinkish colour. 'The lower parts of the legs are covered with a thick mane, forming a band on the lower part of the chin and the lower part of the neck which is more conspicuous than the upper part. 'The ears are large, and covered with a thick mane, forming a band on the lower part of the neck which is more conspicuous than the upper part.' (Zool. Journ., vol. iv.)

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But it would seem that the most common method of catching them is by imitating their sharp but not very shrill whistle, and thus bringing them within shot of the Indian's poisoned arrow.

Lient. Maw, who, as we have above seen, brought a young animal of this species to England, speaks of it as feeding upon herbs and the branches of trees, and going much into the water, walking along or rather perhaps scrounging the bottom of a mud. "It possesses," says Lient. Maw, "great strength, particularly in the fore part of the body; but is harmless, except when attacked. It is said to pass directly through the thickets without following any previous track made in the mud; it is attacked by a Tiger" (Felix Onis) [LEOPARD, VOL. XIII., p. 436]. "The tiger generally springs upon the Tapir's back, when the latter rushes into the woods and endeavours to kill the assailant by dashing him against some large tree. Although strong and a frequently heavilymale, the Tapir is said to be fleet." (Journal of a Passage, &c.)

This species is mild in captivity and easily domesticated. Sonnini states that several tame Tapirs are permitted to go at liberty through the streets of Cayenne, and to wander into the woods, whence they return in the evening to the house where they are kept and fed. He adds that they are capable of attachment to their owner, and expresses his opinion that care and attention might convert its qualities of strength, docility, and patience to account as a beast of burden.

**American Tapir.**

**Fossil Tapirs.**

Dr. Buckland, in his Regulosa Diluvianæ, notices the remains of Tapir in company with those of rhinoceros, elephant, horse, ox, deer, hyena, bear, tiger, fox, wolf, mastodon, hog, and beaver, in the Val d'Arno, on the authority of Mr. Pentland; and in his interesting and instructive first plate illustrative of his Bridgewater Treatise figures a Tapir in little among the mammalia of the first period of the Tertiary series (Eocene of Lyell). In the Epplesheim sand (Miocene of Lyell), Professor Kaup found two species larger than those now living.

It should be here observed that the second or Miocene system of tertiary deposits contains a mixture of the extinct genera of lacustrine mammal of the first or Eocene series, with the earliest forms of existing genera. M. Desnoyers first noticed this in the Paluns of Tournais, where the remains of Parathotherium, Anthracotherium, and Lophiodon were found mixed with the bones of the tapir, mastodon, rhinoceros, hippopotamus, and horse. These remains were fractured and rolled, and sometimes covered with flues, and must, Dr. Buckland observes, have been derived from caves drifted into an estuary or sea.

Von Meyer records the following species: *Tapir Avernomens, Croaz, and Joss* from the diluvium, Puy-de-Dôme; *Mastodontoides Harlan*, from Kentucky, with a justifiable query, whether it is a Tapir at all; and *Tapir Priecus, Kaup*, from the Epplesheim sand. He also alludes to other remains noticed in the works of Fischer, Chift, and Eichwald.

Dr. Lund, in his "View of the Fauna of Brazil," states that he had in vain looked for either remains or foot-prints of the living Tapir; whence he concludes, that it does not take refuge in caves: but he says that he is in possession of fossil bones which evidently belong to the genus, though they are too imperfect to determine their relation to the recent animal.

**TAPPING, or Paraentëtsis (in Surgery).** is the operation usually employed for the removal of fluid from any of the serous cavities of the body in which it has collected in a dangerous quantity. It is accomplished by means of an instrument called a trocar, and a tube, or canula, in which it exactly fits. The trocar is of steel, cylindrical through the chief part of its length, and terminated by a crescentshaped pyramid which ends in a very sharp point. The canula being placed upon its shaft, the trocar is thrust into the cavity containing the fluid, and being then withdrawn from the body, the aperture till all the fluid is discharged. The diseases for which tapping is chiefly performed are ascites, hydrothorax, hydrocele, and, occasionally, hydrocelephalus, and effusions of fluid in the pericardium.

**TAPTY.** [HINDUWAT, p. 211.]

**TAPUH.** [SOLOGO ARCHIPELAGO.]

**TAR, a well-known empyreumatic product.**

The properties of tar are, that it is a viscid brown semi-fluid mass, which long preserves its softness. If it be mixed with water, it acquires a yellow colour and the taste of tar, with slightly acid properties; this solution is well known by the name of tar-water, and has been used in medicine. Tar is soluble in alcohol, in ether, and in the Fixed and volatile oils.

If tar be distilled with water, there passes over a brown liquid which consists of much empyreumatic oil and some oil of turpentine; this product is called oil of tar; by redistillation with water it becomes colourless; the substance remaining in the still is pitch; so that, in fact, tar is a mixture of oil and pitch.

Within a few years, tar has been subjected to a minute examination by Reichenbach, who has obtained from it a variety of substances possessing very different properties; the most important of which is called Talc [Calk].

After what has been stated of the many different compound substances of which tar is constituted, no exact analysis could of course be stated; its chief constituent is carbon, combined with hydrogen and oxygen, and a small portion of azote.

**TAR (French, Goudron; German, Theer; Italian, Carbone; Spanish, Alquitran; Polish, Smola Gesta; Russian, Degot, Smola shthoko; Swedish, Fjärå), is obtained from wood or coal by distillation in empty vessels, or in piles from which the air is excluded. Pitch (French, Poir; German, Pech; Italian, Puce; Spanish, Pez; Russian, Smola gus-tajoj) is commonly obtained by the inspissation of tar, or by boiling it until all the volatile matters are driven off, for the chemical properties of tar, see the preceding article.**

**Tar** is extensively manufactured from the roots and branches of pines and firs in Norway, Sweden, Germany, Russia, North America, and other places; as trees are brought down, but that made in the north of Europe is considered far superior to what is produced in the United States. The process usually followed is described in Dr. E. D. Clarke's Travels in Scandinavia, and is, he states, similar to that which, according to Theophrastus and Dioscorides, was practised by the antient Greeks.

He observes indeed that there is not the smallest difference between a tar-work in the forests of Westro-Bothnia and that of antient Greece. After describing the vessels which cover the soil down even to the water's edge, about the inlets of the Gulf of Bothnia, Dr. Clarke says, "From the most southern parts of Westro-Bothnia to the northern extremity of the Gulf, the inhabitants are employed in the manufacture of tar, proofs of which are visible in the whole extent of the coast. . . . The situation most favourable to the process is in a forest near to a marsh or bog; because the roots of the fir, from which tar is principally extracted, are always more productive in such places, and the cavity is then made in the ground (generally in the side of a bank or sloping hill), and the roots of the fir, together with logs and billets of the same, being neatly traced in a stack of the same conical shape, are let into this cavity. The whole is then covered with a small mound, and the little parts being dissipated, which, by means of a heavy wooden mallet and a wooden stamper worked separately by two men, is beaten down and rendered as firm as possible above the wood. The stack of billets is then kindled, and a slow combustion of the fire takes place.
without flame, as in making charcoal. During this combustion the tar exudes; and a cast-iron pan being at the bottom of the funnel, with a spout which projects through the side of the brick, barrels are placed beneath this pan to collect the fluid as it comes away. As fast as the barrels are filled, they are bunged and made ready for exportation. From this description, he adds, 'it will be evident that the mode of obtaining tar is by a kind of distillation and combustion; the turning of the trees into fire, mixing with the sap and juices of the fire, while the wood itself, becoming charred, is converted into charcoal.' The process of tar-making in Sweden, north of the Bothnian Gulf, has been more recently described in Laing's 'Description of the Process of Making Tar,' 1785, which work was the first to consider the question of tar-making. The process is as follows: 'The operation begins by setting the tar-heaps in order; and the stems are pulled out to break the rock to powder, and boiling it with water. About the year 1779, in consequence, as before stated, of the American war, some lamp-black manufacturers at Bristol turned their attention to the making of tar from pit-coal; and in 1781, Lord Dundonald, a nobleman distinguished for his scientific pursuits, obtained a patent for improvements upon the process previously followed. Mr. Pitt, of Pendeford, near Wolverhampton, in a letter addressed to the Society of Arts, in 1790, on the subject of tar-making, 'As the smoke from converting the smoke of steam-engine furnaces into tar, alludes to three establishments at Bradley, Tipton, and Dudley Wood, erected by Lord Dundonald and the gentlemen connected with him; and the operation was then carried on with success. These tar-workers,' says Mr. Pitt, 'are erected in the vicinity of large iron and coal works: the iron-masters furnish the tar-works with raw coal gratis, and receive in return the coke produced therefrom. Such is the profit, or the purchase of the smoke only for their labour and interest of capital.'

The import duty upon tar has been for some years past 12d. per last, 3/ from British possessions, and 15s. if from foreign countries; but under the new tariff of Sir Robert Peel (1842), it is respectively 6d. and 2s. 6d. per last. The quantity imported in the years 1842 and 1843 was 60,622 lasts, or about 12,124 lasts per annum; of which 58,106 lasts, or 11,621 lasts annually, were entered for home consumption. During this period the duty amounted to £9,952, or upon an average 88s. per last. This is above the quantity of coal and charcoal imported into Great Britain, of which 50,156 lasts were declared in the year 1843. The quantities imported from the United States, 6,446 lasts; Sweden, 2,287 lasts; Denmark, 1,300 lasts; and Norway, 348 lasts; were also considered to be the full amount of such quantities from Germany, Prussia, &c.

The pitch is extensively manufactured in Great Britain, yet the quantity exported in 1829 is stated, by M'Culloch, to have been about 10,782 cwt. The duty is 10d. per cwt., if from foreign countries, and 9d. if from British possessions; or, under the new tariff, 6d. and 1d. per cwt.

(Dr. E. D. Clarke's Travels in Scandinavia, sec. i., pp. 211, 252; Laing's Tour in Sweden in 1838, p. 176; Macpherson's Annals of Commerce; M'Culloch's Dictionary of Commerce.)

TARA. [Siberia.] TARABLOUS. [Syria.] TARAI. [Hindustan, p. 217.]
TARAKAI is the name of a large island, which has long figured on our maps, under the name of Saghalian, or Saghalian, and has at times been supposed to be called Tchoks, Karafito, and Bandan. This island extends from south of 46° to 54° 20' N. lat., more than 600 miles in length, but the width is various. Towards the southern extremity of Tarakai, it is about 150 miles wide, but it soon contracts to about 25 miles, which is about its average width as far north as the Bay of Patience, where it suddenly expands to 120 miles. Cape Patience runs approximately parallel to the coast at this point, and is very nearly at right angles across the island. The entire passage between Cape Patience and the southern extremity of the island, known as the strait of St. John, which is the principal entrance into the northern sea, is navigated, but at that point a shoal extends across the gulf, on which there is only water for boats. That portion of the gulf which lies between 51° 30' and 52° 30' N. lat. is not known. Krusenstern thinks that this part of the island is the same as the island of the same name, but Bourbon, which is not known. This island, but La Perouse expresses the opinion that dried fish is carried from the western shores of the island to the river Amur in boats, which could not be done if the isthmus of Krusenstern existed. It may appear strange that these two navigators have not been able to decide this point, as it seems to be certain that they did not think it advisable to proceed farther. If an isthmus exists, it must be near 52° 30' N. lat., where a low sandy cape, a little more than 4° long. The southern extremity of the island, between Cape Crillon and Cape Aniva, is a long, narrow bay, the Bay of Aniva, which is enclosed by two projecting tongues of land, and extends 50 miles from Cape Crillon to Cape Aniva. The extreme northern extremity. The projecting headland, which occurs near 49° N. lat., on the eastern side of Tarakai, and terminates with Cape Patience, encloses the Bay of Patience, which is very extensive, but open and exposed to eastern Mediterranean gales. At the southern extremity of the island is the Northern Bay, between the cape of that name and Cape Mary. It is not very large, and offers in several places good anchorage and shelter.

The island is naturally divided into three tracts, the mountainous tract, which occupies the southern division of the island; the level, in the middle; and the hilly tract, which extends over the northern district. The mountain-region is the largest, and comprehends more than one-half of the island, terminating on the north at Cape Délide de la Croyère (near 51° 1' N. lat.). A chain of mountains begins at Cape Crillon, and continues in an uninterrupted line northward to an elevated summit called Peak Bearnizel, where it seems to be united to another and lower chain, which traverses the eastern peninsula, and incloses the Bay of Aniva on the east. Cape Aniva is formed by a high isolated hill, which is connected by a low isthmus with the chain of hills which joins further north, and joins the principal range at Peak Bearnizel. Farther north occur other summits, as Peak Lamanon, Peak Monges, and Mount Tiera; the last two mentioned are north of 50° N. lat. None of these summits have been measured, but their elevation is not expected to exceed 2000 feet above sea-level. Along the western coast the mountains in some places come close up to the water's edge, but a narrow level tract generally separates them from the shore, and this tract is covered with small trees, while some of the mountains are mostly bare, probably owing to the rarity of their slope. Extensive flats occur at Aniva Bay and the Bay of Patience. The low country which skirts the shore on the eastern side of the mountains appears to be more extensive and less interrupted than that along the western shores. On the eastern side the shore in some places is level and low, and in others elevated. The country extending from 51° to 53° N. lat. is so low that the shores are not visible at the distance of five or six miles, and it is indebted to the intervention of a small cone of mountainous land, partly sandy and partly swampy, and a great part of it is covered with short bushes or small trees. A number of low sand-hills are dispersed over the country, which are destitute of timber, but appear in places covered with verdure. The hilly tract occupies the most northern part of the island, or that which extends from 53° N. lat. to Cape Elizabeth. The coast is in general high and steep, being generally composed of perpendicular white cliffs. There are only a few interior tracts of land, in which there is a surface level, or nearly so, and which are capable of subsistence, but it seems that such tracts as are found here do not appear to support any considerable number of inhabitants. The climate of this island seems to possess a considerable degree of fertility.

The coast is of great extent and much indented, it does not appear that there are many good harbours. Along the western shores only open roadsteads have been found, with a narrow extremity of the island, between Cape Crillon and Cape Aniva, which is wide open, the Bay of Aniva, which is enclosed by two projecting tongues of land, and extends 50 miles from Cape Crillon to Cape Aniva. The entire passage between Cape Patience and the southern extremity of the island, known as the strait of St. John, which is the principal entrance into the northern sea, is navigated, but at that point a shoal extends across the gulf, on which there is only water for boats. That portion of the gulf which lies between 51° 30' and 52° 30' N. lat. is

Climate.—As European navigators have only occasionally visited this island, and have only stayed there a few days, or at the utmost a couple of weeks, our information respecting the climate is extremely deficient. We only know that even at the beginning of June the higher summits of the mountains have still some snow on them, which indicates that the country must be much colder than Great Britain, which is in a great degree destitute of timber, and which is not covered with verdure. The pole: otherwise the summer months seem to be temperate, but the continual fogs which enclose the island nearly all the year round are more dense than those that occur on the coasts of North America.

Productions.—No kind of grain is cultivated, not even round the settlements of the Japanese, nor are orchards or kitchen-gardens mentioned. The inhabitants however derive profit from the spontaneous products of the soil: they dry the roots of a species of lily for winter food, and collect great quantities of garlic and angelia, which are found on the skirts of the woods. The forests consist of oak, maple, birch, and medlar, but chiefly of fir. Large tracts are covered with juniper-trees. Gooseberries, raspberries, and strawberries abound, and wild celery and watercresses. It does not appear that wild animals are numerous: only martens and bears are mentioned, and even these do not seem to be common. The sea supplies the inhabitants with fish of various kinds, which they catch, perhaps nowhere so abundant as in the Gulf of Tartary. The account of La Perouse in this respect seems hardly credible. Dried and smoked salmon, together with the skins of salmon, are prepared for the foreign market, and constitute the principal, and chief of export. Herrings which are very abundant, are likewise cured and exported. Cod occurs, but it does not seem to be taken to such an amount as to form an article of export. Whales are numerous in the Strait of La Perouse and along the eastern coast, and train-oil is exported. The same is true of the same parts seals, fur-seals (Phoca urina), sea-lions (Phoca jubata), and sea-otters (Lutra marina) are very frequent. No mines are worked.

The inhabitants of this island, whom a few Japanese have settled on the Bay of Aniva, and a few Manchus on the Northern Bay. In the Japanese settlements are a few Japanese officers, but no Chinese authorities have been
been, nor is this island enumerated among the possessions of the Chinese. The aborigines call themselves Ainuos (i.e. men), and are at present known under that name as a nation. This nation extends northward to the peninsula of Kamtchatka, of which it forms the most northern extremity near Cape Lopatka, and it inhabits the Kurile Islands, the Japanese island of Yeso, Tanakai, and the coast of the Eminent of Asia from the mouth of the Amur river southward to the very boundary-line of Corea. They never cultivate the soil; they apply their time to hunting wild animals, and they keep no domestic animals except dogs, which they use in winter for drawing their sledges, like the inhabitants of Kamtchatka. La Perouse found them somewhat shorter in stature than Europeans, rarely exceeding five and a half feet in height. Their countenances are benevolent and friendly; they have tolerably large eyes, thick lips, rather high cheek-bones, and a somewhat broad and compressed nose. Their cheeks and chins are covered with long, thick, black beards; there are many individuals whose body is covered with hair, as occasionally is the case in Europe. The only kind of manufacture among them is a kind of cloth made of the bark of willow-trees, which are very common in the island, and which they manufacture in the same way as the Spaniards do in their use in this manufacture a machine. The other articles of cloth they obtain by barter from the Japanese and Mantchous. They show also some skill in the erection of their huts and the building of their boats; they have no clothes, which they cover with the white bark of birch, and have a roof of wood thatched with dry straw. La Perouse compares them with the cottages of the peasants of France. Their boats are of large size and strongly built. Some of their inhabitants have adopted the practice of letting their nails grow to a considerable length, and their mode of saluting by prostration. Like them, they sit on mats, and eat with little sticks. Their language does not resemble either that of the Japanese, Chinese, or Mantchous. The Mantchous visit the northern and western coast to barter dried and smoked salmon, and dried herrings, for some nankeen, tobacco, and utensils. The Japanese visit the southern and eastern districts, where they obtain train-oil, herrings and salmon, and a few days' stay. They return laden with drinking vessels, tobacco and tobacco-pipes, kitchen utensils, rice, coarse cotton-cloth, and some minor articles.

(La Perouse's Voyage round the World; Broughton's Voyage of Discovery in the Northern Part of the Pacific; Krusenstern, Voyage round the World; and Krusenstern's Recueil de Memoires explicatives, &c.; Langsdorff's Voyages and Travels in various Parts of the World.)

TARANTA, TARANTASE, or TARANTASE. [Savoy.]

Tara is a peculiar nervous affection which was long supposed to be the consequence of the bite of the Tarantula Spider. It seems to have occurred frequently in the kingdom of Naples during the sixteenth century, and to have been nearly similar in its characters to the disease which was originally called St. Vitus's dance [Chorea], and to which that has occasionally prevailed in parts of Scotland, and has been called the 'leaping ague.'

The patients, nearly all of whom were women, soon after being bitten (as it was supposed) used to fall into a profound stupor, from which nothing roused them but the sound of such music as pleased them, on hearing which they had an irresistible desire to dance. So long as the music lasted, they was in tune; then they would go on jumping and dancing till they fell exhausted; and, all the time, some used to shriek, some to laugh and sing, some to weep. When, after a short rest, they had recovered from their fatigue, they would again begin to dance with as much vigour as before, unless the music were played slowly or confusedly, when they would stop and grow anxious and melancholy, or even, if the music were not soon made agreeable to them, would fall into a profound stupor. This fit was continued about four days, and seemed to be cured by the profuse perspiations brought on by the active exercise; but it often returned at the same time in the following year, or even for a succession of years, and on every occasion renewed the same symptoms.

Since it has been found that the bite of the Tarantula can produce no such strange effects as these, many have suspected that the disease ascribed to it never really existed, but was signified for the purpose of exciting pity or for the pleasure of dancing. There is good reason to believe that in most instances it was merely counterfeited; but there can be no doubt that such a disease had occurred and had given occasion to the practice of the fraud. Besides its similarity to diseases whose reality is generally admitted, such as the St. Vitus's dance and the leaping ague, cases have occasionally been met with in recent times which closely resemble it, and in which there could be no doubt of its existence. The dance of St. Vitus was described by Mr. K. Wood, in the seventh volume of the 'Medico-Chirurgical Transactions.' Another is recorded by Mr. Crichton, in the 31st volume of the 'Edinburgh Medical and Surgical Journal,' and in the 'Cyclopedia of Practical Medicine.' It is absolutely certain that all the above-mentioned affections are related. All these however occurred singly. That the Tarantism and the St. Vitus's dance should have assumed the characters of epidemics may be ascribed to their propagating themselves, as all convulsions are apt to do among nervous and superstitious persons, by the propensity to imitation, the effects of which are still frequently seen in the production of hysteria, chorées, and other similar diseases.

TARANTANUS, a species of Apulis, in the kingdom of Naples, in the administrative province of Lecce, or Term d'Otranto. It is an archbishop's see, and the head town of a district: it contains 18,000 inhabitants. It occupies a flat site, near which are some ancient Tarantum, being confined to the island or peninsula at the entrance of the inner harbour or Mare piccolo, on which formerly stood the fortress or acropolis of Tarantum. There are few remains of the ancient town. Modern Taranto is full of houses which is fortified and has three, several miles south of the Taranto, of the eastern coast of Italy which extends from Messina to Cape Leucas. The large gulf which lies between the coast of Calabria and the Iapigian peninsula is called the gulf of Taranto. Much wool is grown in the neighbourhood of Taranto. Two lagoons, one of them of considerable extent, which lie south-east of the town, and which communicate with the sea, yield a great quantity of salt by evaporation. The district of Taranto contains above 87,000 inhabitants.

TARANTO, Taranto. [Italy.] A town and a port of the province of Taranto, on the northwest shore of the Ialysian or Lucanian coast, on the east coast of Italy. It is said to have been founded by the Messapians, to which were joined some Cretan colonists from the neighbouring town of Uria. About 694 B.C., according to the story, Phialantas, one of the Parthenians, or illegitimate sons of the Spartan women born during the absence of their husbands in the first Messenian war, having left his country with a number of others of the same condition, arrived on the coast of Iapigia, took Tarantum, and expelled the original inhabitants. He organized the new community, which had been established at that place, and expelled by an insurrection, and withdrew to Brundisium, where he died. (Justin, iii. 4.) A war between the Tarantines and the Iapigians ensued, in which the people of Rhegium assisted the Tarantines, and were defeated by the Iapigians, who destroyed a great number of the Tarantines. (Diodorus, xi.) Tarantum however recovered from its losses, and it flourished by commerce, acquired a considerable extent of territory, and became the most powerful and strongest city on the east coast of Italy. Herodotus (i. 336) mentions Aristophantes as king of Tarantum in the time of Darius Hystaspes. The government however underwent several changes, and Strabo (vi. 190) speaks of Tarantum as being at one time the dominion of the Thracians, a nation which had made a body of laws for the Tarantines. (Archives.) About 338 B.C. the Tarantines, being engaged in war with their neighbours the Lucanians, applied to Sparta...
for assistance. Archidamus, the son of Agathinus, was sent to them, and he was killed in fighting on their side. Some years after, being hard pressed by the Lucanians and Bruttii, the Tarentines applied to Alexander, king of Epirus, and uncle to Alexander the Great. He came to Italy with troops, obtained considerable advantages, but was driven back by the land of the Romans, b.c. 323. (Justin, xii. 2; Livy, xiii. 24.) The Tarentines had by this time degenerated; like most of the Greeks on the Italian coast, they had become luxurious and had lost all the habits of drinking early in the morning, and their appearing intoxicated in the forum.

In the year 282 b.c. the Romans, after having conquered the Samnitian, made war upon the Lucanians. The Tarentines, therefore, had not expected it. An unexpected attack a Roman fleet, commanded by the Proconsul L. Valerius, which was sailing near their coast, and killed a great many of the crew. The Roman senate and consuls demanded to reparation for the outrage, but the Tarentines treated them with insult. Aroused however to a sense of their danger, they applied to Pyrrhus, king of Epirus, for assistance, and sent vessels to convey him over with his troops, b.c. 281. Pyrrhus soon arrived, and they persuaded him to give him much support, and he was obliged to assume a dictatorial power in order to enforce something like order and obedience among them. Chiefs with his own troops, he carried on the war against Rome for nine years, but was defeated in 280 by the consul M. Curtius Du Crassus, who was obliged to re-embark for Epirus; leaving however a garrison in Tarentum, b.c. 275. [Pyrrhus.] The Tarentines having shortly after quarrelled with the Epirote garrison, applied to the Carthaginians for assistance to drive away the Epirotes. The Romans having had notice of this negotiation through Milo, the Epirote commander, sent the consul L. Papirius Cursor, who took Tarentum, and allowed the Epirote garrison to return home. It appears however that the bank of the Tarentines, which though treated with severity, were placed in the condition of allies of Rome, which they continued to be till after the battle of Cannae, when Hannibal, who occupied Campania and Apulia, began to find the secret intelligence with some of the Tarentine chief citizens, who were dissatisfied with their forced Roman alliance.

In the year 212 b.c. the hostages of the Tarentines ran away from Rome, but being pursued and overtaken near Tarentum, they were taken and brought to Rome from each other defeated. The towers were thrown down the Tarpeian rock. This cruel punishment irritated the people of Tarentum, an agreement was made with Hannibal, and his troops were admitted into the city by night. The Roman garrison stationed in the citadel and the country by land and sea. The example of Tarentum was followed by Metapontum and Thurium. The Roman garrison in the citadel of Tarentum defended it most gallantly, although they suffered greatly from want of provisions. An attempt which was made to introduce supplies by vessels from Sicily was defeated by the Tarentine squadron under Democrats, with the loss of several Roman ships. In 209 b.c. the consuls Q. Fabius Maximus retook Tarentum by surprise, and through the treachery of the garrison left by Hannibal, which consisted of Bruttian auxiliaries. The Tarentines made only a slight defence. Nico, Democrats, and Philomeneus, the leaders of the party which was hostile to Rome, had during the siege an opportunity given, but the Romans, said to be nearly equal to that made at the taking of Syracuse. But the consuls Fabius abstained from taking the statues of the gods, saying he would leave to the Tarentines their angry detlies. (Livy, xxv. 7, 11; xxvi. 39, and xviii. 18, 16.)

From that time Tarentum remained in subjection to Rome; and although it greatly declined in wealth and importance, it was still a considerable place in the time of Augustus. Horace calls it 'molle Tarentum' (Satire, ii. 4, 15; Epenis, i. 7). The Tarantine language and manners were retained by the inhabitants even after the fall of the Western Empire. Tarentum was one of the chief strongholds retained by the Byzantine emperors. It was used in manufacture of glass, and the noble Longobard duke of Beneventum, took Tarentum from the Byzantines. The Saracens landed at Tarentum about A.D. 880. The town was afterwards several times taken and re-
impact to the place an air of life and activity which con-
trasts remarkably with the ordinary dulness of Beaucaire.

Tarascon has a communal college or high school and a
public library of 2000 vols.; it was the birth-place of
Leon Ménard, the antiquary. The town was for a long
time after the Revolution the seat of a subprefecture or
capital of an arrondissement; but about the time of
the first restoration of the Bourbons, the subprefecture
was removed to Arles.

(Voyage de Villiers, Itinéraire Description de la France;
Malte Brun, Dictionnaire Géographique Uni.)

There is another town in France called Tarascon, in
the department of Ardeche, and on the river Arle above Foix:
It is from its position sometimes distinguished as Tarascon
dedes Pyrénées, from the impression which it makes on the
Tarascenians of Pliny (Hist. Nat. lib. iii. c. 5, 6), which
others would fix at Tarascon on the Rhône. Tarascon-
Târás in a small place, a part of the ironstone
in the adjacent Pyrénées. The population is probably
about 1500.

TARA/XACUM. [LEXI DONDO.

TARASCON, a considerable district of Aragon in
Spain, bordering on the north and east on the province of
Navarre and Catalonia, and on the west on the Correimiento
de Bòra. The capital, Tarascon, the ancient Turiaso, is situated at the foot of
a lofty mountain range called the Moncayo, on the banks of the river
Teruel; its latitude is 32° 56' N. lat., and 59° 25' E. long.
It was the seat of a bishopric and suffragan of Saragossa.
The town is built on, and the streets narrow and
crooked. With the exception of the cathedral, a fine
Gothic pile erected in the thirteenth century, there is no
other building of note. M. Dictionnaire Géographique Uni,
vol. viii., p. 392) estimates the population of
Taracon at 10,000 inhabitants, in 1827. The
neighbourhood is well cultivated, and yields abundant crop
of all sorts of

TARBES, a town in France, capital of the department of
Hautes Pyrénées, or High Pyrénées; about 400 miles
from Paris, in a direct line south-west-south-west; 438 miles
by the shortest road through Orleans, Châteauroux, Limoges,
Béziers, Agen, and Auch; or 533 miles by Limoges,
Caors, Montauban, Toulouse, and Auch, which is the
route given by Reichard in his Itinéraire. It is in 43° 13'
N. lat. and 0° 4' E. long.

TARVE is situated in the "Notitia Provinciarum et
Civilitatum Galliae," where it is called Tarva: it was the
chief town of the Bigorrens, Bigerri, or Begerr, a nation
which has given name to the district of Bigorre. In
the town or adjacent to it was a fortress, called, in the "Notitia,"
Château Tarve, an island of which stood the town occupied
by the cathedral. In the middle ages, Tarbes was the capital
of the county of Bigorre; it suffered from the ravages of the
Saracens and the Normans, and was held for a time
by the English. There was some sharp fighting near the
town, in the campaign of the Duke of Wellington, in 1814.

Tarbes is situated in a fertile plain, near 1000 feet
above the level of the sea, watered by the Adour (on the
left bank of which the town stands) and by the Lechez,
and bounded on the south by the Pyrénées. The town is
walled; the streets are well laid out, broad, paved,
and watered by little brooks or streams, which contribute both to
coolness and cleanliness. There are two public places
or squares, that of Mauconget, which is planted with
trees, and the Parc public, previously the site of which
are an agreeable promenade, called Le Prado, outside the walls.
The houses in the town are generally of two or three stories, well built,
of brick, stone of marble, and roofed with slates. They have
for the most part the same characteristics. The principal public
buildings are the cathedral; the prefect's office, formerly
the residence of the bishop, which from its elevated situation
commands a pleasant prospect; and a handsome three
storeyed mansion on the west side of the town.

Of the counts of Bigorre is used as a prison. Tarbes has five
faubourgs, or suburbs, on the five roads which lead from it
in different directions: the suburbs are that of Raba-
tens on the east, on the right bank of the Adour, which
separates it from the town; that of Vic on the north; that of
Bagnères on the south; all on the roads leading respec-
tively to those places; that of Sainte Anne on the west,
on the road to Pau; and that of Sainte Catherine on
the south-west, on the road to Lourdes and Argelès.

The population of the commune, in 1826, was 8712; in
1831, 9766; in 1836, 12,630. There are copper-mills
and manufactories for copper utensils, paper-mills, and tan-
bark; the town is the market-place for the supply of the
deartment; there is a considerable market every fortnight
for agricultural produce of every kind and for cattle,
much frequented by the Spaniards, who make large purchases
of live stock. There is a marble-quarry near the town.

The Tarbes has a sub-deanery court of justice and a com-
mercial court, some fiscal and other government offices: a
communal high school with a library, and school buildings
of good architecture; a free school of drawing and archi-
tecture; a school of agriculture; and a govern-
ment store, for which there are stables, a forge, and a
disposable school and a handsome riding-school, just outside the
town.

The arrondissement of Tarbes has an area of 905 square
miles, and comprehends 177 communes: the population,
in 1831, was 104,422; in 1836, 110,942; and is divided
into eleven cantons, or districts, each under a justice
of the peace. The bishopric of Tarbes dates from the
sixth century, and now comprehends the department:
the bishop is a suffragan of the archbishop of Auch.

M. Dictionnaire Géographique Uni. de la France;
Malte Brun, Géographie Universelle; Dictionnaire
Géographique Uni.)

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and two hundred pounds. Without any explanation, as if it were
matter of notoriety, he contrasts subtle and aeroditose weight, the former having 100 pounds to the hundred-
weight, the latter 112. In the rougher sort of goods, at the same
period, the tare was (as appears by the tables that give the
values) between 15 and 112; but since the hundredweight of 112 pounds was only an allowance for the
weight of the box, barrel, or other package.

TARES are a most important green crop in the improved
systems of agriculture, especially on heavy soils, where
the growth of green manure is desirable. When sown in autumn and cathed with a slight sprinkling of wheat or rye, they cover the ground in spring, and supply abundance of fodder in summer. A good crop
of tares is fully equal in value, if not superior, to one of
reeds cultivated in the same manner. They give the land a hasty summer tillage, which is so useful in
destroying weeds, and to allow turnips to be sown in the
same season. They thomor annual weeds if the crop is
plentiful, which should always be secured by an abun-
dant manuring: thus they are a good substitute for a
summer fallow in heavy soils, and aptly repay the labour
and manure bestowed upon them.

There are many species and varieties of tares; but that
which is found for the most part in the northern counties is
the common tare (Vicia sativa), of which there are two
principal varieties, very slightly differing in appearance, one of which is hardy, and will stand the severest winters;
the other is more tender, and is therefore only sown in spring, and is raised much more rapidly, so that spring tares sown in March will be fit to
be cut within a fortnight or three weeks after which they
were sown in autumn. By sowing them at regular inter-
vals from September to May, winter tares, are sown in
February, in the spring, bloom, or when the pods are
formed, may be cut for several months, from May to Oc-
tober. A prudent farmer arranges his crops so that he
shall have artificial green food for his horses and cattle at
least two or three times during the year. The difference
between the first and second cut of clover. When there
are more tares than is absolutely required for this purpose,
and the weather permits, they make excellent hay; or, if
the weather is not favourable, they are cut and given to
sheep, which are folded on the portion already cut. It
is an advantage to have portable racks for this purpose,
that the fodder may not be trod under foot and wasted;
or the tares may be placed between hurdles, tied two and
two, which form extemporaneous racks. It is prudent to
raise sufficient seed for another year; but a crop of seed-

TARES may be sold for sale is seldom profitable, as they greatly

The price varies so much in differ-
ent species, that it becomes too much of a speculation;
and the farmer is not always sure whether the crop of the
winter tare from the spring variety is so great, that it
should either be raised at home, or only purchased from
neighbours, or from the most respectable seedsmen.

It is a common practice with dealers to mix the seeds of the
winter tares, after the time of sowing is past, with spring

Tares, which are in request at a later period. The incon-
venience of this is, that they do not vegetate equally, and
consequently the winter tare is not in bloom when the
spring tare is fit for the scythe. Foreign tares, which are
impregnated in large quantities, are often the growth of
southern climates, and will not stand the winter; or they
have been raised from seed sown in spring, so as to be
really spring tares. The difference is probably more owing

to the early months of spring was or peas are to be used for
them. When spring tares are sown in autumn instead of
winter tares, they may occasionally stand the frost, if not
very severe; but, in general, they rot on the ground and
never recover; whereas the real hardy winter tares, whose
vegetation is slower, seem insensible to the severest
frosts.

In the early part of summer green rye and tares, mixed, are
sold at a great price in large towns, for horses which have
not been trapped: they are dried, and then prepared
as a gentle laxative, and cool the blood: near London,
where every produce is forced with an abundance of
mature, tares are often fit to cut early in May, and the
land is immediately ploughed with manure, in the half
or three-quarter measure, or put under the bag, which
has been cut in September or October, in time for wheat-

These two very profitable crops are raised during the time that
the land, according to the old system, would have
been fallow; and at the same time it is left as clean, by
careful hoing, as the best fallow would have made it.

There are a great many species of tares or vetches, for
the terms are synonymous, many of which have been pro-
posed to be introduced into general cultivation; but none
of them are so well adapted as the common tare: some have biennial and some pe-
rennial roots. The Vicia biennis has a strong stem and
large leaves, and grows four or five feet high; but it is not
so succulent as the common sort. It might, perhaps, by
the intervention of other crops, be cultivated to advantage,
and it may be worth while to make some experiments with
it. There are several species of tares which grow
wild in bushes and hedges; but they have never been
cultivated, perhaps from their habit of germinating the
seeds, which shed as soon as they are ripe. Of these,
the Vicia iaca appears most deserving of attention.
It bears its blue flower on stems or spikes longer than the
leaves, which are downy. It is very common in France
among wheat; and, although a decided weed there, it is
not much dreaded by the peasants, as it improves the
fodder greatly. It has the appearance of great luxuriance in
its growth, where it meets with a proper support. If
planted with plants with a parable, such as the Bokhara clover (Melilotus arboreus altissima), which
itself affords much fodder, it might probably be cultivated
to great advantage.

In the south of France there is a white perennial vetch
or tare, called Vicia planifrons, which is cultivated for its
white seeds, of which soups are made, as with the pea and
lentil. It grows in very light soils; and, although indig-
enous to a southern climate, it is said not to be impatient
of frost. It has been called by some the Canadian lentil,
or the white tare.

We shall only notice one more of the wild tares, which
is an annual; it is called the yellow tare (Vicia lutea).
It grows in stony soils and among bushes, is very branching,
and rises from one to two feet high. From some ex-
periments made by the Agricultural Society of Versailles
several years ago, it would appear that this tare might be
cultivated with great advantage, and is even superior to
the common sort, because it can be cut two or three times
during the summer, and affords a very good pasture in
winter, which does not stop its vegetation: it will even
bloom in a mild winter. Although short, it is so thick
upon the ground, that its first cut is as heavy as that of the
common tare, which is seldom worth cutting a second time.

Tares should be sown on land which is well pul-
versified. If after wheat, the stubble should be ploughed in
with a deep furrow after a powerful scyther has gone on
the land several times to loosen it: five or six furrows will
be sufficient. The tares should be sown in the
spring, but not more than a mile apart, the places
should be prepared as for grain; and the tares

This is perhaps the cheapest mode of manuring the land,
the only expense being the seed; for the tillage is ne-
necessary at all events. In light soils, tares and buckwheat
soon grow together immediately after barley, and will
produce a considerable crop of vegetable matter, which
may be ploughed in in November. In favourable
seasons, wheat may be sown immediately after, without fearing the
effect of two white crops following each other; for the
leaves and buckwheat after enjoying the warmth of

two ploughings of the ground, one when they are sown,
and the second when they are ploughed in, will entirely
destroy all weeds, and give to the soil that improvement
which will enable it to be sown early the following year.
If this had done had it been sown the year after on a
clover ley. Clover, which could not be sown with the
barley, from the foul state of the land, may be sown among
the wheat in the next spring, when it is hoed for the

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second time. This is held out as a hint to show how an accidental interruption in a rotation may be remedied without any loss of crop or great deviation. As no rule is without exception, so no rotation can always be strictly adhered to; and the crop which is arrived at at different times of the year are of the greatest use as substitutes for others which could not be conveniently sown without materially altering the succession of crops. In the common course of cultivation of heavy soils, where the crop is not one which admits of being spread over the land, one half of the land which requires fallowing may be sown with tares; and thus the clean unproductive summer fallow will only return at every second rotation. If the tares have been manured, or if they are fed off with sheep manure, the wheat which is sown after them will be as good as on a clean fallow, or after a good crop of clover. This would make tares a valuable crop; and they may be compared in their effect on heavy lands to turnips on lighter soils.

The seeds of the tare are occasionally ground into meal and made into bread. It is a very poor food; and when there is more seed than can be profitably disposed of, it may be grown for pigs; but pigs, especially pigeons, are not fond of it. When given in large quantities, tares are found very heating; and although they produce a fine glossy coat, they are not to be recommended for this purpose.

TARGUM. [TARANTO.] TARGUMS, or CHALDEE PARAPHRASES OF THE OLD TESTAMENT. During the Babylonian captivity, the language of the Jews was affected by the Chaldee dialect spoken at Babylon, to such an extent, that upon his return to Judea, he could not understand the pure Hebrew of their sacred books; and therefore, when Ezra and the Levites read the law to the people, they found themselves obliged to add an explanation of it, undoubtedly in Chaldee. (Nehem., viii. 8.) [Barzaw Langaou; ARAMAIC LANGUAGE.] In consequence of this, the Jews were obliged to commit to writing, and from their being not simple versions, but explanatory paraphrases, they were called by the Chaldee word Targum (תַּרָּגֻמּ), which signifies a translation.

There are ten Targums extant:—1. The Targum of Onkelos, on the Pentateuch, is the most antient. Onkelos is supposed to have lived at Babylon. The Babylonish Talmud makes him a contemporary of Gamaliel, at the very beginning of the Christian era. No critices place him lower than the second century. His language approaches nearer than that of the other Targums to the pure Chaldee of the books of Daniel and Ezra. He followed the Talmudic text, and so closely, that his work is less a paraphrase than a version, and he is free from the fables which prevailed among the later Jews.

2. The Targum of Jonathan ben Uzziel, on the Prophets, is by many ascribed to an author contemporary with the prophet himself, or at least to the first generation of his school. Uzziel was a disciple of the elder Hiilf. The mention of his name in the Talmuds proves him to have lived earlier than the fourth and fifth centuries. But Jahn points out certain internal marks, from which he concludes that this Targum was compiled, towards the end of the third century after Christ, from other paraphrases, some of which at least were considerably older. The Jews make Jonathan contemporary with the prophet, but later critics consider him as a forger, and as frequently inconsistent with each other. Hence they seek to operate to the complete exclusion of foreign produce, and in so far no revenue can of course be received; and sometimes, when the duty is inordinately high, the amount of revenue thereby derived is not sufficient for the maintenance of those in attendance, and the damage to the commercial interests of the State is greater than the advantage that accrues from the increase of revenue which is derived from the duty; and the details are constantly fluctuating with the change of interests and the wants of the community, or in pursuance of commercial treaties with other states. The British tariff has undergone six important alterations since the reign of the last sixty years, namely in 1767, 1809, 1819, 1825, 1833, and 1842. The act embodying the tariff of 1833 is the 3 & 4 Wm. IV., c. 56. Its character has been described in the Report of a Committee of the House of Commons in 1840.

The Targums have been used as a source of evidence for the investigation of the text of the Old Testament, and have been considered as of great importance in the formation of the Septuagint. They have been used also as a means of determining the original meaning of the Hebrew text, and have been employed in the preparation of the Vulgate, the Latin version of the Bible, and in the translation of the Bible into other languages. They have been used also as a means of determining the original meaning of the Hebrew text, and have been employed in the preparation of the Vulgate, the Latin version of the Bible, and in the translation of the Bible into other languages.
The new tariff, which is on the point of becoming law, contains very numerous alterations. Cattle and fresh meat are admitted, for the first time, on payment of duty; and the reduction of duty on salted meat has been increased. Time will be required to show the result of the various changes which it contains. The heads of the tariff are comprised under nineteen heads, and the articles enumerated are as many as those in the tariff of 1893.

TARLOK.

TARLTON, RICHARD, a comic actor of great celebrity in the reign of Queen Elizabeth, was born in the hundred of Condover, in Shropshire. The date of his birth is not known. In 1599, he acted in the play of 'The Two Pots'; and he married (September 3) at St. Leonard's, Shoreditch, London.

Tarlton was especially distinguished for his performance of the clowns of the old English drama, in which he is spoken of as having been unrivalled, and seems besides to have been one of those clowns who spoke more than was set down for them: he was famous for his extemporaneous wit, which indeed must have been an important addition to the dull and vulgar speeches generally assigned to the clowns before Shakespeare's time. He interfered with his wit the less when his speech was good. Dr. Cave, 'De Politicis,' Oxford, 4to., 1598, says, (we translate Cave's Latin) 'We English have our Tarlton, in whose voice and countenance dwells every kind of comic expression, and whose eccentric and undumpish performances are in play when our wit kicks.'

Stow mentions that Tarlton was one of the twelve actors whom Queen Elizabeth, in 1583, constituted grooms of the chamber at Barn Elms: he seems indeed to have been one of her especial favourites; for Fuller says, that 'when Queen Elizabeth died, skirting his places, and out of good humour, he could undumb her at his pleasure. Her highest favourites would, in some cases, go to Tarlton before they would go to the queen, and he was the rather in request on account of his advantageous access to her.'

One of Tarlton's last performances was in 'The Famous Victories of Henry V.;' this was in 1588, at the Bull in Bishopsgate Street, to which theatre he seems to have been generally attached. Of this play, which is a much earlier one than Shakspeare's 'Henry V.;' a full account is given in the introductory notice to 'Henry VI., Parts I. and II.' in Knight's 'Pictorial Shakespeare.' It is one of the 'Six Old Plays,' printed by Nichols in 1779.

Tarlton is known to have written at least one play, 'The Seven Deadly Sins,' which, though never printed, and now lost, was much admired. Gabriel Hervey, in his 'Four Letters and certaine Sonnets especially touching Robert Greene and other Parties by him abused,' 4to., 1592, speaks of a Tarlton play, as having been 'anually conveyed according to the stile and tenour of Tarlton's president, his famous play of 'The Seven Deadly Sins,' which he designates as 'a most deadly but most lively play.'

There is a portrait of Tarlton, in his clown's dress, with his pipe and tabor, in the Harl. MS. 3885; and a similar portrait of him (probably the one a copy of the other) in the title-page of a pamphlet called 'Tarlton's Jests,' 4to., 1611. A copy of the former portrait is given in Knight's 'Shakespeare,' at the end of 'Twelfth Night.' The peculiar flatness of his nose is said to have been occasioned by an injury which that feature received in parting some dogs and bears.

Basil, in his 'Metaphisic Dramatica,' by Reed and Jones.

TARN, a river in France, belonging to the system of the Garonne. It rises near Mont-Louzère, one of the Cévennes, in the department of Lozère, and flows first west to Sainte Emilie in the same department, 27 miles, and then south-west 27 miles to Milhan, in the department of Aveyron; from thence west-south-west 88 miles, by Alby and Gaillac, department of Tarn, to St. Sulpice; and from thence 48 miles north-west and west by Montauban (department of Tarn) to the river Garonne, at Marseissac. The navigation is marked in Brue's map of France as commencing at Gaillac, and has a length of about 60 miles; other authorities make the navigation commence at Alby, and this statement agrees with the official designation to the river Garonne, by the navigation of 80 miles. It has several tributaries, but none of them are navigable. [France; Garonne; Tarn (department); Tarn et Garonne.]

TARN, a department in the south of France, bounded on the north and north-east by that of Aveyron, on the south-east by that of Hérault, on the south by that of Aude, on the south-west and west by that of Haute-Garonne, and on the north-west by that of Tarn and Garonne. The form of this department approximates to that of a parallelogram, having its sides respectively facing the north-east, south-east, south-west, and north-west. The extreme length from north-west to south-east, from the neighbourhood of Penne on the one hand to the department of Tarn and Garonne, is 100 miles; from St. Pons, 66 miles; the extreme breadth, from the neighbourhood of Valence to that of Puy-Laurenco, is 46 miles. The area is estimated at 2222 square miles, which is somewhat greater than that of the French departments, and rather greater than the joint areas of the two English counties Surrey and Sussex. The population, in 1826, was 327,655; in 1831, 335,844; and in 1856, 346,614, showing an increase in five years of 10,770 persons, or above 3 per cent., and giving 156 inhabitants to a square mile. In amount and density of population it is below the average of the French departments, and is far below the county of Surrey alone in amount, and in density of population below both Surrey and Sussex. Alby, the capital, is on the Tarn, 339 miles long; it has the highest point and the chief town in the south of France, and is a place of great importance. The Tarn is a small river, which runs southward and south-east from the junction of the Vair and the Aveyron, tributary on the eastern side of the department, bounded by a line drawn southward or south-east from the junction of the Vair and the Aveyron, a tributary on the northern side of the department, the secondary formations, which lie between the cretaceous group and the green sandstone group, with the old marine strata. The department is quite a large one with considerable rivers, but the Aveyron and Tarn are the only ones of great importance. The department belongs entirely to the basin of the Garonne. The Tarn, one of the principal feeders of that river, touches the border of the department just above the junction of the little river Rance, and flows along the border till that stream (which belongs altogether to the department of Aisne) joins it; it then proceeds northwards and flows westward to Alby and then south-west to the junction of the Agout, shortly after which it quits the department to enter that of Haute Garonne: the navigation commences at Gaillac, or, according to some authorities, at Alby. Just above Alby the Tarn has a fall, or rather a series of falls, over the steep face of a limestone rock, in which it has worn a number of channels, which divide the stream, that when the water is high it may be crossed by ferrying from one side to another. This river is called Saut de Sabot or Saut du Tarn. The tributaries of the Tarn which belong to this department are the Aveyron, the Tescou, and the Agout. The Aveyron has only a small part of its course, that part which belongs to this department, on the border; its affluent the Viar has part of its course along the border: but the Cerou and the Verre, two other affluents of the Aveyron, belong to this department almost entirely. The Agout rises in the department of Hérault, but belongs almost entirely to this department.
as do its affluents, the Vieu (which receives the Vézère),
the Gijou (which receives the Gjias and the Berliou), the
Tauré (which receives the Larn and the Larteme), the Sor,
the Bagas, and the Adou. None of the tributaries of the
Tarn or their affluents are navigable, though some of them,
are considered large, the Aveyron being above 120
miles, the Vear, the Aoust, and the Adou 45; the
others are smaller.

There are in the department five Routes Royales, or
government roads, which had January 1831, an aggregate
length of 207 miles, of which 116 miles were in good re-
pair, 85 miles out of repair, and 6 miles unfinished.
None of these roads are of the first class: the principal are those
which lead from Alby south-west, by Gaillac, Lisle, and
Rabastens, to Toulouse; north, by Lot and Millau, and
across the Cévennes into Langedoc; east by Villeneuve
La Cavalerie, on the high road from Paris to Montpellier;
and north-east by Carmeaux to Rodez, in the department
of Aveyron. Roads branch from the Alby and Toulouse
road at Gaillac, and lead one west to Montauban and Bor-
deauz, one north by Cahusac and Cordes to Aurillac, in
the department of Cantal. Another road leads from Ca-
tres by Lavaur to Toulouse. The departmental roads had
at the same time an aggregate length of 209 miles, of which
95 miles were in good repair, 103 miles out of repair, and
2 miles unfinished. The provincial roads had an estimated aggregate length of 7500 miles in
round numbers.

The area of the department is equal to rather more than
1,400,000 acres; considerably more than one-half of this is
under the plough. The soil, except in the mountainous parts, is generally fertile; but agriculture is in a very
backward state; manures are neglected, and the system of
rotation is very faulty. These deficiencies are chiefly ob-
served among the comanions of Alby and Gaillac; which
cannot comprehend the beautiful valley of the Tarn; in the
arrondissements of Castres and Lavaur, in the south of the
department, improvements have been more readily
adopted. The produce in grain, comprehending wheat, barley, oats, rye, maize, and buckwheat, is sufficient to
supply the consumption of the department and to leave a
little for exportation. Pulse, flax, hemp, wood, aniseed,
coriander, and saffron are also raised; the growth of wood
is of considerable importance and of considerable import-
ance. The meadows and grass lands may be estimated at about 100,000
acres, and the heaths, commons, and other open pastures
at 150,000 acres. The valleys and the slopes of the hills afford good pasturage, and the breeding of cattle is one of
the principal sources of the wealth of the department. Sheep and pigs are numerous, and the veal is in high
repute. The breed of horses is improving. The vineyards
occupy nearly 80,000 acres; the cultivation of the vine is
very skilfully and carefully managed. The red wines of Carcassonne, Béziers, St. Just, St. Martin, Amaury, and Gaillac, are chiefly of the first class; those of Meilhat, La Roque, Florentin,
La Grave, Técon, and Rabastens are of the second class;
Gaillac produces some white wines. The average produc-
ate of the vintage is estimated at about 400,000 hectolitres,
valued at 5,000,000 francs. The orchards and gardens
occupy about 6000 acres. The olive is not cultivated to
any extent.

The woodlands occupy 200,000 acres; the oak, the
beech, the ash, the maple, the chestnut, the walnut, the
mulberry, and the wild cherry-tree are common.

Bees are numerous, but the breeding of the silkworm
is not carried on to the extent of which it is capable. The
wild bea, the roebuck, the wolf, the fox, the badger, the pule-
co, the hare, the wild boar, are found; and small game is
tolerably abundant.

The department is divided into four arrondissements, as follows:

<table>
<thead>
<tr>
<th>Arrondissement</th>
<th>Name</th>
<th>Population</th>
<th>Com. and manufact.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alby</td>
<td>81,934</td>
<td>84,929</td>
<td></td>
</tr>
<tr>
<td>Castres</td>
<td>131,154</td>
<td>136,198</td>
<td>95</td>
</tr>
<tr>
<td>Gaillac</td>
<td>71,323</td>
<td>72,001</td>
<td>79</td>
</tr>
<tr>
<td>Lavaur</td>
<td>52,143</td>
<td>53,496</td>
<td>57</td>
</tr>
</tbody>
</table>

2,232 335,944 346,614 327 33

In the arrondissement of Alby are—Alby, or Albi on the
Tarn; population, in 1831, 9049 for the town, or 11,605 for
the whole commune; in 1836, 11,801 for the commune [Alby]; Castelnau and Lescure, on the Tarn; Rode-

(pop. 2100 for the town, or 2560 for the whole commune
on the Adou, and Villeneuve de Castres and Brugères on a
tributary of the river, the Gijou, Carmeaux, Monastet, and Salies
are the Ceron, or its tributaries, Villeneuves, Adou, and
Pampelonne, on the Vear. Castelnau, distinguished
as Castelnau-de-Bonfous, is built on a slope rising for
the north bank of the Tarn, just below Alby, and is a
considerable market-town. Near the place, and in
Valence is regularly laid out with straight streets in a
well-wooded district, from which a considerable quantity of timber is sent to Alby, Gaillac, and Bordeaux; the
town has five large fairs, chiefly for cattle. Leather and
goods are made at Carmeaux; and considerable trade is car-
ried on at Monestet in linen, thread, and cloth. Monestet
has thirteen fairs, Salties two, and Villeneuve distinguished
as Villeneuve-sur-Verre) five. Pampelonne, or Pamp.
freque, is surrounded by several fairs of its fortifications, it
has two large markets. There are only two fairs, in large
places or squares. Considerable business is done in
hosecloths, which are manufactured; and there are as
yearly fairs.

In the arrondissement of Castres are—Castres, on the
Aoust, population, in 1831, 12,032 for the town, or 16,484
for the whole commune; in 1836, 17,622 for the whole
commune [Castres]; Brassec, Fort-de-Ferrières, Roque-
courbe, Bourras, and Vielmeur, all on the Aoust; Alby
Hautpoul, Carmaux, and Gijou; Gaillac and Guillac (the
whole commune), and La Brugière, on the Tauré or
tributaries; La Capue (pop. 1650 for the town, or 3011 for
the whole commune), on the Gijou; Vibres, on the Gijou;
Montagnon, on the Adou; La Besonnée, and Lautre, be-
tween Tarn and the Adou, all on the Adou (pop. 1574 for
the town, or 2817 for the whole commune). In the southern
corner of the department, Castres distinguished
as Brassac-de-Bellforts, is the centre of a con-
siderable manufacture of dimity and other cotton
goods, carried on in the village of Brassac-Castelnau (which
is included in the commune of the town), and other villas
around. Fort de Ferrières takes its name from a select
fort, once used as a state prison, now as a manufactory of
cotton goods of various sorts, some dye-houses, and
several paper-mills: it has four fairs for cattle, wool, and manufactured goods. Flannels, blankets, and other woollens are manufactured at
La Brugière, distinguished as La Brugière-Dulac; horsecloths,
and dimity at La Capue; and calicoes, dimities, and other cot-
ton goods, and flannel at Vibres, distinguished as Vabres-
des-Étangs. Vibres has a Protestant church; four fairs
are held in the year. Mondargue, now of little importance,
was formerly of considerable note: it has six yearly
fairs; many small fairs are sold out to small eminence, and has the ruins of an ancient castle; it has ten
yearly fairs. The neighbourhood produces good wine and
melons. Laurtre was formerly a viscountcy: it was bel-
onged to the French Crown, 1, by Odet de Fos; it has a
certain distinction in the history of that family.
Dourgne has some manufactures of coarse woollens, three
cattle-fairs, and in the environs some important quarters
of white and gray mohair. Sorèze had formerly a neat
fifteenth century church, where twelve young people
were buried; but without fortune, received a gratuitous education: it has now a college or high school, one of the most
important in the south of France. Cotton yarn, woollen
cotton hosiery, and leather are made; and there yearly fairs. Sorèze was fortified by the Huguenots in the
religious wars of the sixteenth century, but the ramparts
T AR

were destroyed in the reign of Louis XIV. At La Ro-
toite, near Castres, are two remarkable natural curiosities: Le Rost, a sandstone tower, 270 feet in height, and Puicheric, on the
Ebre, 360 cubic feet, and resting on a very narrow base, so as to
rock or vibrate sensibly when pushed, like the Logan
or Logan Stone, in Cornwall; and the grotto which bears
the name of St. Dominic, from having served as a retreat to

In the Provençé of Gaillac are — Gaillac (population
in 1831, 3552 for the town, or 7725 for the whole com-
bune; in 1836, 8199 for the commune), on the Tarn; Lade (pop. 1726 for the town, or 6063 for the whole com-
bune; in 1836, 7177 for the town, or 6966 for the whole commune), on the same river; Penne, on the Aveyron;
Cordes (pop. 2239 for the town, or 2022 for the commune), on the Cérou; Castarray, Cauzac; Castelsau de
l'Hers, and Puicheric, on the Ebre; Graulhet, near the Tarn;
Cerou, near the Tescou; and Cadalen, between the Tarn and the Adou. Gaillac is on the right or north bank of the
Tarn; it is an old town without any striking public build-
ing; there are an hospital and a small theatre. East of
the town is a suburb, well laid out and pleasantly situated.
There are brandy distilleries and cooperages, and one or
twelve yards, dyeworks, and yards for building boats and
other river-raft. Trade is carried on in corn, wine, and
vegetables; there are seven yearly fairs and one Annual fair (like
other Local fairs) at Gaillac. A horse fair is held in the
Tarn town, with a place or square regularly laid out and adorned
with a fountain. Considerable trade is carried on in corn
and wine, and there are seven yearly fairs for cattle, linen
cloth, and hogs; and in the Roman times, Rabastens, near the close of Caesar's campaign, was a considerable
bank of the Tarn, is an ill laid out and ill-built town.
There is a pleasant suburb, and adjacent to it an agreeable
promenade. Some blankets are manufactured, and some trade carried on in corn, wine, and fruit; there are
seven yearly fairs. Rabastens has the ruins of an ancient
castle, which was taken by Simon de Montfort in the reli-
gious wars of the thirteenth century, and by the English
in the wars of the fourteenth century. Cordes is on an
elevated site on the left bank of the Cérou: it is entered
some plate of the old Provençal or ancient castle: linen and leather are manufactured; there is a considerable
weekly market for corn and fruit, and there are six
yearly fairs. Castelsau de l'Hers was a small town in
the fourteenth century. Some trade in cattle is carried on at Cadalen.

In the Provençé of Lavaur are,—Lavaur or Laveur,
near the Agout (population in 1831, 4422 for the town, or
7179 for the whole commune; in 1836, 7265 for the com-
bune); Giroussens and St. Sulpice, on or near the same river;
Pay-Laurins (population 1799 for the town, or 6190 for
the whole commune), near the head of the Giron, an
important feeder of the Garonne; and Graulhet (popu-
lation 4945 for the town, or 5007 for the whole commune
and Behalix, on or near the Adou. Lavaur is on the left
bank of the Agout, which is here crossed by a modern
bridge of solid construction. The town was defended by
fortifications, and was taken by a cautious attack in 1457
by the English, who negotiated the early part of the
thirteenth century, it was one of the strongholds of the
Albigensians, from whom it was taken, a.d. 1211, by Simon
de Montfort, who committed the most fearful cruelties.
The chief streets and avenues of the new town, but is altogether ill built. The chief branch of industry is
flax-drawing. The raw silks of Haut or Upper Languedoc
are brought here; and when thrown are sent to Nimes and
towards Lyons. Some silk-stuffs for the upholsterers, and silk
mending are sent to the surrounding districts: there are
three yearly fairs. Lavaur has a high school, a small public library, an agricultural society, and a
subordinate court of justice. Giroussens was formerly a
place of strength, and the object of contest in the English
war of the fourteenth century. It stands on the right
side of the Tarn: the townsman manufacture brown
pottery, but their ware is less in request than formerly.
There is one yearly fair on the last day of July, on a small
eminence commanding the surrounding fertile plain. It
was one of the strongholds of the Huguenots in the reli-
gious war of the sixteenth century: but the fortifications
were razed in the reign of Louis XIII.

The town appears to have been after this period occupied by the Jesuits, who established here an Academy of Sciences, which was suppressed
after the revocation of the Edict of Nantes.
Silk-drawing
is carried on, and there is considerable trade with Spain in
silk-stuffs and mules: there are five well-attended yearly fairs.
Graulhet, on the right bank of the Tarn, is chiefly
considerable manufacture of hats and woollen stuffs, and a
number of tan-yards. Considerable trade in horses is
carried on, and there are five cattle-fairs. The district round
the town is fertile: military and political fame.

The population, when not otherwise described, is from
the census of 1831.

That part of France, which now constitutes this depart-
ment was chiefly comprehended, in the earliest historical
period, in the territory of the Ruteni. The southern por-
tions were comprehended in the territory of the Umbranici,
and the south-western in that of the Tolosates. That part
of the territory of the Ruteni which was comprehended in
the department is considered by D'Anville to have been
occupied by the Laveur, or these Provinciales, distinguished by
Caesar by that epithet from the other Ruteni, as being
within the limits of the Roman province at the time of his
command in Gaul. The Umbranici and Tolosates were
subdued by Caesar. All these nations appear to have belonged
to the Great Celtic stock. Under the Romans the Ruteni
(including the Ruteni Provinciales) was placed in the
province of Aquitania Prima; the Umbranici and Tolosates, in
Narbonensis Prima. The town of the Albigenses (Civitatis Albiginae) of the 'Notitia' was probably Alby: the Albigi of the anonymous Geo-
grapher of Ravenna was probably the same place. No other
Roman town can be identified with any locality within the
department. The river Laveur is noticed by Ausonius (Mo-
scellus Descriptio, 465) and Sidonius Apollinaris (Carmen,
Book IV, 40), under the name of Laveur, which appears on
it the epitaph 'surfer,' the 'gold-bearing;' the second
calls it 'citius, the 'swift.'

In the middle ages, and down to the period of the Revo-

The greater portion of this department was known as
the territory of the L'Albigeois, and the central and the
adjacent parts, formed the district of Le Bas (Lower) Languedoc. Alby was the chief town of L'Albigesias; Lavaur of Bas Languedoc.

Upon the downfall of the Roman Empire this part of
France passed into the hands of the Visigoths, and subse-
quently of the Franks under Clovis. The district of L'Albi-
gesia was part of the great duchy of Guillaume in the time
of the older kings of the Merovingian dynasty. It was sub-
sequently held in succession by the counts of Toulouse, the
viscounts of Béziers and the counts of Carcassonne.

and was, in the early part of the thirteenth century, the
scene of the fearful cruelties perpetrated in the crusade
against the Albigenses or Albigenses, a sect deriving their
name from the district, and persecuted by the Roman
church as heretical. [Albigenses.] In the sequel of this
the district of L'Albigesia was annexed to the county
of Toulouse and was occupied by the counts of Carcassonne and Barcelona; one of these
latter, having become king of Aragon, ceded the Lava-
uisus to the Viscount of Béziers, who again ceded it to
St. Louis, king of France. It was alienated by Louis XI,
who gave it to the crown of Aragon, but was reunited
to the crown by Henri IV.

T AR ET GARONNE, a department in the south of
France, situated between 43° 47' and 44° 28' N. lat., and
0° 44' and 2° 0' E. long. It is bounded on the north by the
department of Lot, on the north-east by that of Avey-
ron, on the east and south-east by that of Tarn, on the south by that of Haute Garonne, on the south-west by that of Gers, and on the north-west by that of Lot et Garonne.

Its basin is the largest in the French interior; it is from east to south-west, from the border of the department of Aveyron near Parisot, to the bank of the little river Lareis, near Latvié-de-Lomagne, 64 miles; the greatest breadth at right angles to its length, is from the southern border of the departments of Lot et Garonne, near Montautigut, to the border of the department of Haute Garonne, near Grizziélas, 44 miles.

The area of the department is estimated at 1421 square miles, which is not so much as two-thirds of the average area of the departments, and is rather less than the English county of Sussex. The population, in 1826, was 241,586; in 1831, 242,509; and in 1836, 242,184, showing a very trifling increase (588 persons, less than 0.25 per cent.) in the ten years from 1826 to 1836; and in the latter half of the ten years (positive decrease). The number of inhabitants to a square mile, in 1836, was 170, which is rather above the average density of the population of France; but the department is inferior in amount of population to most other departments; and both in amount and density of population to the English county with which we have compared it. Montauban, the capital, is 335 miles in a direct line south by west of Paris, or 406 miles by the road through Paris, Orléans, Châtellerault, Bordeaux, and Cahors.

This department was not one of those formed at the first establishment of the departmental division of France by the National Assembly, A.D. 1790; but was created by a senatus-consultum under the reign of Napoleon, A.D. 1806. It was formed by the annexation of the department of Montauban, which was taken from the department of Lot; the arrondissement of Castel Sarrazin, taken from the department of Haute Garonne; the cantons of Avullillar, Montaigut, and Valence, the latter in the arrondissement of Agen, in the department of Lot et Garonne; the canton of Lavit-de-Lomagne, taken from the arrondissement of Lectoure, in the department of Gers; and the canton of St. Antonin, taken from the arrondissement of Villefranche, in the department of Aveyron, the department thus formed thus (positive decrease).

The department has no mountains and scarcely any great hills; slight undulations alone vary its surface. The greater part is occupied by the tertiary formations of the basin of the Gironde; the part north-east of St. Antonin, on the Aveyron, and Puy-la-Roque, is occupied by the secondary formations which intervene between the chalk and limestone, or new red sandstone. Some inhabitants enumerate coal among the productions of the department; but this is hardly consistent with its geological character, nor were any coal-mines wrought in 1834 and 1835, of which the official returns are before us. Some iron mines are reported and there were found in 1834, one iron ore, with two furnaces for making pig-iron, and five forges for making wrought-iron. charcoal was the fuel almost exclusively employed. Marble and good freestone are quarried in the north-east part of the department; and limestone, marl, and potter's-clay are dug in several places.

The department belongs altogether to the basin of the Garonne. The Garonne itself enters it on the south side, a little below Grenade, and flows north-west by Verdun and Le-Mas-Garnier, to the junction of the Tarn: it then flows a few miles west by Auvillard, and turning again north-west, and passing Valence, quits the department. It has about 40 miles of its course (according to the official account) in this department, navigable throughout. The Tarn enters the department on the south-east; it flows first north-west by Montauban to the neighbourhood of La France; and then, in a winding channel, winds into the Garonne, which it joins on the right bank: its whole course in this department may be estimated at 36 miles (40 according to the official account), navigable throughout. These are the only navigable rivers. Of smaller streams, the Garonne receives on the left side the Lague, the Gironde, the Le Tableau, the junction of the Tarn: and the Lareis, or Rats, below the junction of that river. The Barregoule (formed by the junction of the Grande Barregoule and the Petite Barregoule) and the Saut (which issues from the Seune) at the Garonne on the right bank, below the junction of the Tarn, and beyond the limits of the department, to which however a considerable part of their course belongs.

The Aveyron, a considerable feeder of the Tarn, which it joins on the right, rises near Lac Loudon in the department of Haute Garonne, has the lower part of its course in this department or simply its boundary. The Tarn receives also the Tescou of which the Tescoucat is a feeder, and the Lembous of (of which the Laffé is a feeder), both on the right bank. The Aveyron, which near the Seve, the Bourian, the Lot, on the right bank; and the Verre and the Tuse on the left.

The department had, 1 Jan., 1837, seven Routes Royales, or government roads, with an aggregate length of 185 miles, viz. 150 miles in good repair and 8 miles unfinished; the aggregate length of the departmental roads at the same time was 234 miles, viz. 156 miles in good repair and 78 miles unfinished: the by-roads and lanes had an aggregate length of 575 miles, viz.

The climate is generally mild, but subject to variations, which occasion frequent attacks of catarra and rheumatism. The mean temperature in winter is from 30° to 32° F. and in summer from 72° to 92°. The department is divided into three distinc-
the Garonne. The vineyards have an extent of about 60,000 acres. A large part of their produce is made into brandy for exportation. The wine is of fair quality, but not first-rate; and in general of a deep colour, which it loses by age.

The orchards and gardens occupy about 4500 acres: the walnut and chestnut trees are of great size: the white mulberry is cultivated in order to rear the silk-worm, which is an object of attention, though not so extensively as it might be made. The wood occupies about 11,000 acres. Game and birds abound: great quantities of the lamprey and the shad are taken in the Garonne in the spring.

The department is divided into three arrondissements, as follows:-

<table>
<thead>
<tr>
<th>Name</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montauban</td>
<td>55,000</td>
</tr>
<tr>
<td>Castel-Sarrasin</td>
<td>28,000</td>
</tr>
<tr>
<td>Tarn</td>
<td>14,000</td>
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</tbody>
</table>

In the arrondissement of Castel-Sarrasin are—Castel-Sarrasin, near the right bank of the Garonne (population, in 1831, 3346 for the town, or 7092 for the whole commune; in 1836, 7408 for the commune); Verdon (population 1809 for the town, or 4234 for the whole commune), Le Mas-Garnier, and St. Nicolas-de-la-Grave, on the Garonne; St. Pierre, near Tarn (population 1800 for the town, or 1600 for the whole commune), and Grizelles or Grizolles (population 1724 for the town, or 2091 for the whole commune), and Lavit de Lomagne, near the Serre. Castel-Sarrasin suffered much in the religious wars, and the quantity of bones and of arms dug up in the neighbourhood bears testimony to the frequency or severity of the plagues which it has witnessed. The town is agreeably situated in a fertile plain about a mile from the Garonne, and is well built. The old walls and ditches have been destroyed, and replaced by agreeable promenades. The townsmen manufacture serge and other woollen stuffs, hats, and leather: there are three yearly fairs. There are one or two subordinate government offices. Verdon, distinguished from other places of the same name as Verdon-sur-Garonne, is the seat of the left bank of the river which has much former importance, but has still some woollen manufactures and three yearly fairs. St. Nicolas-de-la-Grave is known for the excellent melons grown in the surrounding district: St. Piqueyrac, near St. Sulpice, is celebrated for its extensive cultivation of tobacco and saffron in the neighbourhood: it has three yearly fairs. Grizelles or Grizolles is in a fertile plain, a short distance from the right bank of the Garonne: the townsmen manufacture a considerable quantity of cutlery, especially excellent knives and three yearly fairs for cattle and horses. At Beaumont-de-Lomagne coarse cloth and other woollens, hats, and leather are manufactured, and trade is carried on in corn: there are seven fairs in the year.

The population, which is otherwise described, is that of the commune, and from the census of 1831.

This part of France, at the earliest historical period, was occupied by the Cadurci, a Celtic people, who were north of the Garonne (now the Garonne, the Tarn, and the river now known as the Tescou; by the Tolosates, also Celts, who inhabited the part south of these rivers; and by the Lactorates (of the Aquitanian stock), in whose territories that small portion of the department which is between the Garonne and the Tarn was included. Perhaps some small portions of the north-western border may have belonged to the Nittobriges, a Celtic people, and some portions of the eastern border to the Ruteni, who were also Celts: but these portions, if they were any, must have been very small. Pliny, who appears to have left their name to the little rivers Tescou and Tescounet, on the banks of which they dwelt, were probably either a subdivision of the Tulosate or the Tarn tribe, which went to them. In the Roman division of Gaul the Tolosates, with the Tascou, were included in the province of Narbonensis Prima; the Cadurci and the Ruteni in that of Aquitanis Prima; and the Nittobriges and Lactorates in Novempopulannae.

Only two places mentioned as Roman authorities are supposed to have been in this department. Casa, mentioned in the Theodosian or Peutinger Table, was probably on the bank of the Aveyron, near Réalville; and the Fines of the same authority may be placed on the Tescou, near the junction of the Tescou and Tarn.

In the middle ages, the north-western parts, about Montaut, Castel-Sagrat, and Valence, as far south as the Garonne, were included in L'Agenois; the northern and north-eastern parts, or the district of Laisse, were in the district of Laisse Quercy, except just about Parisot and St. Antonin, which belonged to La Basse Marche in Rouergue; L'Agenois, Quercy, and Rouergue were all subdivisions of Guiane. South of the Garonne the whole was included in Gascony or Gascogne, or sometimes in Guienne. The Garonne was comprehended in the Condomois, a district of Gascogne Proper; and the part eastward of the Larzac in Lomagne and Riviere-Verdun, two districts in Bas (Lower) otherwise Noir (Black) Armagnac. The districts between the Garonne and the Tarn, the district of Le Lousais, from the district of Le Toulousain, or the county of Toulouse, properly so called, in Languedoc.

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These territories, upon the overthrow of the Roman empire, passed into the hands of the Visigoths, from whom they were afterwards wrested by the Franks. The county of Toulouse was annexed to the crown in the reign of Philippe III. le Hardi; the county of Armagnac first by Louis XI. and finally by Henri II. and Rouergue finally by Francois I. Le Quercy and L’Agenois were for a long time part of the English possessions in France. The English were finally driven out in the middle of the fifteenth century.

TARNOPOL is a circle in the eastern part of Austrian Galicia, bordering on the Russian government of Podolia. The area is about 1400 square miles, and the population 212,500, of whom about 13,000 are Jews. The surface of the country is an undulating plain broken by hills, the forests are very extensive, and the soil in general extremely fertile: it produces corn, flax, hemp, tobacco, garden vegetables, and fruits. The fine meadows, says Hussel, would enable the inhabitants to breed great numbers of cattle, but it is the breeding of horses that is more considerable than in the rest of Galicia; they are of the true Polish race.

In 1817 there were 36,273 horses, 9412 oxen, 26,339 cows, and 59,282 sheep. According to the very detailed statistical tables for 1830 (p. 266), which are the most important that we have, there were 41,223 horses, 11,156 oxen, 26,065 cows, and 81,983 sheep. There is no large river in the circle; the Podhorze forms the eastern boundary towards Russia, and the interior is watered by the Sered, the Tryna, the Guala, and a number of small streams.

TARNOPOL, the capital of the above circle, is a considerable town, with 10,500 inhabitants, of whom nearly half are Jews. It is situated on the river Sered, which there flows through a lake. There are in the town a Catholic church, a Greek church, a Jesuits’ college, a gymnasium, and a philosophical seminary. In the year 1820, 50 of the Jesuits expelled from Russia were allowed to settle in a Dominican convent at Tarnopol. The sum of 600 florins a year was assigned to each for a moderate sum for the establishment of the gymnasium, it being intended that they should be solely employed in the education of youth in and out of the town. The inhabitants have a pretty considerable trade, but have not made much progress in manufactures. The principal establishment is a tannery. As in most Polish towns, the houses are of wood, and the streets unpaved, where filth of all kinds is suffered to accumulate.

(A. H. Stein; Cannabich; Mission from the Church of England, Rom 1842.)

TARNOW, a circle of Austrian Galicia, is bounded on the north by the Vistula, which separates it from Poland, on the east by the San, on the south by the Jado, and on the south-east by Sanok, and on the west by Bochnia. The area is 1421 square miles, and the population must be at least 240,000; since, according to the statistical tables for 1830, it was 238,453, of whom 14,638 were Jews. The country is an extensive plain, with here and there an insignificant hill. The soil is on the whole very fertile, in many parts sandy and ill-cultivated.

The rivers are, the Vistula on the north, the Dunaje, on the west, and the Wislok, which flows through the middle of the circle. Though the chief occupation of the inhabitants is agriculture, its operations are performed in a very slow and manner, and the breeding of cattle is by no means in proportion to the extent of the country: the forests however are very profitable, and there is no other circle in Galicia where the people make so many wooden wares of various kinds. There are numerous manufactories, and, properly speaking, except in the chief towns and their neighbourhood, but the country-people manufacture a great quantity of linen.

Tarnów, the capital of the circle, is pleasantly situated on an eminence near the river Biela, over which there is a handsome wooden bridge of one arch of 180 feet span, which is entirely covered over. The population of the town, without the suburb, is 2250, of whom 1500 are Jews; while the population in 1830 was only 900. The humidity of the river for the most part well built of brick, two stories high. This town is the see of a Roman Catholic bishop, and the seat of the tribunal of the circle. It has a cathedral, a Franciscan convent, a synagogue, a gymnasium, a Jewish infirmary, a hospital, and a grammar school. The inhabitants manufacture linen, damask, wooden-ware, and cabinet-work. They have many inns, and carry on a brisk trade. The cathedral contains the monuments of the princes Janusz von Ostrog, and of the counts of Tarnow-Tarnowsky: two of them are built to 70 feet height, and reach to the roof of the church. The two extremities are very well adorned; as works of art.

TEARPEIAN ROCK. (Rom.)

TARPEIOLY. (Cheshire.)

TARQUINII (Tarquinia, or Tarquinopolis), an ancient towm on the river Tiber, in the southern Etruria, which empties itself into the sea a few miles below. According to Strabo (v. 2, p. 355, ed. Taeuschitz), the town was founded by Tarcon, one of the companions of Tyrrhenus (Stephan. Byzant., s. e. Tarquenia; Virgil, Aen., vii. 505, Steph. Byz.), an Illyrian, who, according to a legend, sailed to Greece while in search of the lost city of Thessaliens and Spianambrius. In the reign of Arlin, Marcus, Demaratus of Corinth is said to have come with his countrymen to Etruria, and to have favourably received by the Tarquinienses; and the city describes itself as the father of T. Quinius, Prince (Tarquinius).

Whatever may be thought of this tradition, it seems clear that Etruria and Tarquinii in particular experienced at an early period considerable influence from Greece. Tarquinius appears to have become in a short time the principal town of the Illyrians in the south of Italy, and it carried on with Rome, and from the important ports which have recently been discovered; and there is little doubt that it formed one of the twelve republics of the South of Italy, and the town of the Illyrians.

After the expulsion of Tarquinii, Siculna from Rome, B.C. 509, the Tarquinienses were the most forward in cause, and unsuccessfully endeavoured to restore their force of arms. (Liv., i. 6. 5.) About the year 306 B.C., the Tarquiniienses made 307 Roman soldiers prisoners, all of whom were sacrificed to the gods. Rome for a time took the lead in all their wars, and Tarquiniienses acquired new allies, and invaded the Roman territory as far as the Saline, at the mouth of the Tiber. At last, however, in 356 B.C., they were defeated by the dictator Marcus Rutulus, and the year after they were completely destroyed. C. Cato, who laid down their arms at this time, declared cruel revenge for the outrage which had been committed upon their prisoners. The common Tarquinienses, who, to the hands of the Romans were all massacred, bed, nobles were sent to Rome, where they were beheaded in the forum. (Lation at ii. 23.) It appears that the Tarquinienses sued for a truce, which was granted for forty years, and, unlike the Tarquinii, like the rest of the Etruscan towns, was not renewed in the wars of Rome with other nations, and in the near century after the expiration of the truce of Tarquinii, there was no almost perfect independence of Rome. Still after the battle of Tucculn, and the peace of the same duration.

At a later period Tarquinii became a Roman Municipium (Cicero, pro Cuncta. iv.)

The site of the ancient Tarquinii is clearly discerned in the ruins still extant on the hill of Tarquinia, near the modern town of Corneto. The place has in modern times acquired a peculiar interest through the numerous works of art which have been discovered in the tombs and catacombs. The first of these were opened in 1699, and was found in the clothes of the dead, and the remains covered with fresco, paintings. The tombs and temples with inscriptions, mosaics, and vases, and beautifully carved stones, were found there. The tomb of Tarquinius Priscus, see Wilcox and Morton, Account of some subterraneous Apartments with Etruscan Inscriptions and Paintings, &c., in the Philosophical Transactions for 1733, vol. 127; in Stackelberg, Allgemeiner Hand-Atlas, VI. Leipzig, 1755. See also the Hypogeum of Tarquinius, 1827, with numerous plates.

TARQUINNIUS. According to early Roman history, a family of the Tarquinii gave two kings and one consul to Rome. Its origin was traced to the town of Tarquin Etruria, and thence to Greece. Modern investigation...
never have shown that the Tarquinii did not come from Etruria, but must originally have belonged to Latium, and that from the earliest times there existed at Rome a gens Tarquinius. (Niebuhr, Hist. of Rome, i., p. 373, sq.) We en-
join a list of those members of the house of the Tarquins who play a prominent part in the history of the city. Prisco, the first king, was followed by Ancus Marcius, the second, and from Ancus Marcius, the old story concerning his birth and his arrival in Rome ran thus:—When the dynasty of Cypselus at Corinth, Demaratus, a wealthy merchant who belonged to the noble family of the Bacch-
chids, came to Rome, he was attacked by the Romans, and was driven from the city. He called to Etruria, which he had often visited before on his mercantile voyages, and took up his residence at Tar-
quinius. Here he married a woman of noble rank, who bore him two sons, Lucumo and Aruns. (Dionys. iii. 46.) Lucumo, being a merchant, sent to Tarquinii from his voyage, and from the great Latins, too, the en-
vironment of which might characterize him as a complete Rhenian, he adopted the name of Lucius Tarquinius, to which subsequently the name Priscus was added to distin-
guish him from the Lucumo of Rome. King Ancus was the most intimate and prudent influence the Tarquinii allowed to take part in all the affairs of state, and in his will he made him the guardian of his children, who were yet under age. (Ann. i. 15.) Lucius Tarquinius himself aspired to become king, but he did not succeed himself at that stage. He was content to govern the young princes out hunting, and during their absence he held the comitia for electing a successor to Ancus, and succeeded in persuading the people to elect him, to the exclusion of the sons of Ancus, 616 B.C.

The title of king was acquired by the posterity of the fifth king of Rome, in the manner in which he came to Rome, and was raised to the throne. How much there may be his-
torical in the tradition cannot be ascertained. Thus much however appears certain, that the arrival of Demar-
atus in Etruria cannot have been contemporaneous with the tyranny of Cypselus, and that, as stated above, Tar-
quinius was not a foreigner, but belonged to a Latin gens Tarquinius. (Niebuhr, Hist. of Rome, i., p. 373, sq.)

1. Tarquinius Priscus distinguished himself during his reign. It is related to him to have been the first king of the state. His first war was against the Latins, from whom he took great spoil. With equal success he car-
ed on war with the Sabines, whom he defeated in two great battles, and who were thus compelled to the submission of the city. After this he again made war on the Latins, and after he had subdued them and made himself master of many of their towns, he concluded a peace with them. During the intervals between these wars he introduced various improvements into the constit-
tution of the state, which are mentioned in the articles Rome, p. 101, and Senatus, and which were intended to organize the body of the plebeians, and perhaps to place them on an equality with the patricians. But he was in danger, which he averted by the amiable character of his adopted son Servius Tullius. He was afterwards acceded to the patricians with appro-

vation. After his first Latin war, Tarquinius built the Circus Maximus for the exhibition of horse races and public spectacles, and is said to have been the founder of the Latin Games (Lucan, Pharsalia, iii. 26). He also assisted the round the forum to private individuals, that they might there build porticoes and places for transacting business; and lastly he is said to have barred the doors to the Senate house (Servius Tullius). The greatest work at Rome, which owes its origin to Tar-
quinius, and which has survived all the vicissitudes of the city, are the gigantic sewers (cloaca) in the lower districts of Rome. (Cloaca.)

The sons of Ancus Marcius, who had been deprived of

the throne by their guardian Tarquin, never forgot the injury, and when they discovered that it was his and Tar-
quinius's intention to secure the succession to Servius Tullius, they formed the design of murdering Tarquin. (Servius Tullius.) For this purpose they hired two sturdy shep-
dards, who went about the Tiber and the Tiberina; and they con-
ducted themselves as if they were engrossed in a violent quarrel. At last the king himself appeared to settle their dispute, but while he was listening to one of them, the other split the king's head with an axe. Thus died L. Tarquinius Superbus, the last king of Rome, in the year 509 before Christ, in B.C. 578. The queen kept his death secret until the

cession was secured to Servius Tullius. The assassins were seized, and the sons of Ancus fled to Seqnea Pometia. (Liv. i. 34-42; Dionys. iii. 46-73.) Tarquinius Priscus, a son of the two sons, Lucumo and Aruns, was the last king of Rome.

During the reign of this king Rome appears as a power-
ful state in comparison with what it is said to have been be-
fore him. According to the historians this greatness was not the result of his reign, but is supposed to have existed before it, and to have enabled him to do what he did, so that this increase of the power and dominion of Rome

must have taken place previous to his reign, although we do not know how it was effected. Some traditions men-
tioned (Tacit. Annal., iv. 65) that under Tarquinius Priscus the Sabines were forced out of their city and walls, and settled on the Caelian hill, which derived its name from him.

Lucius Tarquinius Superbus, the seventh and last king of Rome, a grandson of Ancus Marcius and the son of Lucumo and Aruns. Tullia, a daughter of Servius Tullius, was married to the gentle Aruns, and her sister to L. Tarquinius. In con-
cert with Lucius, Tullia murdered her own husband Aruns and her sister, and then married L. Tarquinius. Lucius Tarquinius Priscus was chosen king after the death of his own father-in-law, the aged Servius Tullius. Tarquinius, who received the surname of the Haughty or the Tyrant (Superbus), succeeded his father-in-law as king of Rome, 509 B.C., without either being elected by the peo-

ple.

There is no doubt that the hatred of the very name of king which prevailed at Rome during the republic, has greatly contributed to exaggerate the cruelty and tyranny of the last king; and thus to corrupt his history. But no-

bodily without the impious and insatiable thirst of power, both as a general and a statesman, quickly raised Rome to

a degree of power which it had never possessed before.

The first act attributed to him after his accession is the death of all the senators who had supported the reforms of Ancus Marcius. Lucius Tarquinius Priscus, being made king, immediately formed an armed body-guard which always accom-
panied him. He in fact undid all that Servius had done: he took on himself the administration of justice, put per-
sons in office by his own choice, and increased his own

power; and, kept the whole internal and external adminis-
tration in his own hands, without either consulting the people or the senate. In order that the senate might sink into insignificance, he never filled up the vacancies which so frequently occurred through his executions, banish-
ments, or through the natural death of senators. To secure himself still more, he formed a close connection with the Latins, to one of whom, Octavius Mamilius of Tusculum, he gave his own daughter in marriage. The influence of this and the friendship which was the most visible in their assemblies on the Alban Mount by the temple of Jupiter Latiarius, in which Rome also had a vot.

Tarquinius, by cunning and fraud, or, according to others, by force of arms, expelled the to Falerii, and to

the Luteti on the boundaries of Latium and Rome, on the ground that the men were the basic people. (Liv. i. 34, 42; Dionys. iv. 45, 82; Cicero, De Re Publ., ii. 24), which was now also joined by the Hernicans and the Volcanic towns of Eneatri and Antium. The wealthy town of Susa took a part in the war, and in order to no longer join the league. The Latin town of Gabii ex
perience a similar fate. Sextus, the king's youngest son, went thither under the pretext of being a deserter, and contrived to put himself at the head of the Gabian army. After having put to death or sent away the distingui-
ished citizens of Gabii by the advice of his father, he treacherously surrendered the town to him. The whole account of the war with Gabii bears the character of a fable, and resembles in many respects other fabulous stories of early Greek history. The treaty which was s
with Gabii after its surrender, was engraved on a wooden shield, and preserved in the temple of Jupiter Fidius to the time of Dionysius of Halicarnassus. Tarquin founded in the conquered territory of the Volsci the two colonies of Signia and Circie, by which he extended and strengthened the power of Rome.

Tarquin is said to have been fond of splendour and magnificence. He built the capitol, with the threefold through which he crossed, and adorned it with brazen statues of the gods and of the early kings. (Liv. i. 53; Dionysius, iv. 59; Pliny, Hist. Nat., xxxii. 4; xxxiv. 13.) Here he also deposited the oracular books which accompanied him from an ancient temple of Apollo (Sculps.) after the establishment of the colonies of Signia and Circie, a fearful omen was seen, which seemed to bode ruin to his family; and in order to ascertain its import he sent his two sons, Sextus and Aruns, accompanied by his nephew, L. Junius Brutus, to Delphi. To the question as to which of the three ambassadors was to reign at Rome, the Pythia answered: he who should first kiss his mother. Brutus, who had always assumed the appearance of an idiot, understood the oracle, and on landing in Italy, fell down and kissed the earth, the mother of all. Tarquin's coffers were now exhausted by the great works that he had undertaken, and he was tempted to make himself master of Ardea, a wealthy town of the Rutuli. As however he did not succeed in capturing the town, he laid siege to it. When he was on a journey, there arose between the sons of Tarquin and their cousin, C. Tarquinius Collatinius, respecting the virtue of their wives. This led to the violation of the chaste Lucretia, the wife of Collatinus, who lived at Colata, and the king's eldest son, M. Tarquinius. The deed of a Roman woman at this time was her virtue. Lucretia sent for her husband, father, and Brutus, and killed herself in their presence, after having cursed the family of the king, and imploring her friends to avenge the injury which was done her. M. Tarquinius immediately marched with an armed force from Collatia to Rome, and roused the people to avenge the indignity and throw off the yoke of their tyrant. The citizens were easily persuaded; they deprived the king of his authority, freed the wretched woman from the perdition, and banished him with his wife and children from Rome, 510 B.C. After these occurrences Tarquin hastened to Rome, but finding the gates of the city shut upon him, and learning that he was declared an exile, he retired to Caere, whither he was followed by his son Aruns. His other son Sextus sought a refuge at Gabii, but the citizens, remembering his former treachery, put him to death. The simple fact of the banishment of King Tarquin, which was commemorated at Rome every year by a festival, the Regillus (the name being derived from Regillus, the name of a stream in Latium), is beyond all doubt historical; but what is described as its immediate cause, and its accompanying circumstances, may be poetical inventions.

The Romans would not give up the hope of recovering what they had lost. He first sent ambassadors to Rome to demand the surrender of his movable property. During their stay in the city the ambassadors formed a conspiracy, in which young patricians chiefly are said to have joined them. The conspirators were discovered and put to death, and the movable property of the royal family was given up to the people, in order to render reconciliation impossible. The king is said to have found favour and protection with the inhabitants of Narnia and Tarquini, and with the Veientes, and to have led the united forces of these people against the Romans, who however defeated their enemies near the forest of Ardea. Brutus fell in this battle in single combat with Aruns. Tarquin now sought and found assistance at Clusium, which was then governed by the mighty Laz Porsonna. [PORSONNA.] During the war of this chieftain with Rome Tarquin is entirely lost sight of in the narrative of the historians; but after its conclusion we find him supported by the Latins, and was regarded as their pope. Rome under the Latin king, Octavius Mamilius of Tusculum. The battle near lake Regillus (496 B.C.), in which the king lost his only surviving son, decided the whole contest. The account of the detail of this battle is as fabulous as any part of the early history of Rome. As the king was expiring, so was the concluding part of the 'Lay of the Tarquins.' The aged king, now deprived of all his hopes, retired to Cumae, which was then governed by the tyrant Ariodates, where he died the year following, 496 B.C.

(Livy, ii. 19, &c.; Dionysius, vi. 2, &c.; Niebuhr, Hist. of Rome, i. p. 555, &c.; Lucullus, ARGENSIUS CAMILLIUS, the son of Egnatius, and the husband of Lucretia. After the banishment of the king he was elected consul together with L. Junius Brutus. But the people beginning to suspect that he might perhaps be tempted to follow the example of his kinsmen, he changed the freedom of the young republic, he was compelled to abandon armed forces under General Sumii, and retire from the town of Aragon. The capital, Tarragona, is situated on the coast of the Mediterranean, on the declivity of a mountain rising to 760 feet above the level of the sea, and near the mouth of the river Francolí, 4½° N. lat. and 1° 17' E. long. Tarragona, the Roman Tarraconensis, was one of the most antient cities of Spain; as it is supposed to have been founded by the Phenicians. During the second Punic War it became a Roman colony (Phin., Hist. Nat., iii. 5, &c.), and; subsequently under Augustus, the capital of his province of Tarraconensium, which comprised Colonia, Aragon, Navarre, Biscay, the Asturias, Galicia, a portion of Leon, and the Balearic islands. Tarraco was the capital of the chief city of one of the seven conventus, or divisions of the Spaniards, who were subject to the governement of the Roman province. Here Tarraco was in Morea, the chief city of the Peloponnesus.

The city being found in a very ruinous and dilapidated state, Don Bernardo, archbishop of Toledo, undertook to rebuild it on condition that the pope would absolve him from the oath he had taken, and not fulfil, of repairing to the Holy Land. The also declared he was the archbishop of Toledo destined the greatest portion of the revenues of his see to the rebuilding of Tarragona. During the War of Succession, the English took possession of the city of Valencia, which was given to the English party. Some of the outworks and redoubts thrown up by them is still visible. In 1810 the French, under Marshal Suchet, laid siege to it, and took it by storm on the 29th of June, 1811, after a siege of several months. The conduct of the French commander on this occasion, he not only justified, but encouraged, the perpetration of all kinds of atrocities, on the ground that he wished to save one dreadful example to terrify the people and prevent all further resistance. An attempt to expel the French, made by Don Carlos, Duke of Parma, in the person of Charles, Duke of Berry, was completely foiled; for at the approach of Suchet, who was advancing from Valencia, that officer raised the siege and re-embarked his troops with such precipitation that he left all his artillery and stores behind.

Tarragona, tolerably well preserved, and the Roman remains render it interesting. Besides the curia, which is now almost entirely built up, it has a very fine amphitheatre, a good state of preservation, and a large Roman building, probably a temple, which the inhabitants call the 'palace of Augustus.' The remains of a splendid aqueduct, which once supplied Tarragona with water, which was brought from a distance of 16 miles, afford likewise a proof of the importance of the city under the Romans. There are also several tombs east of the town, and a fine museum, which the vulgar call 'El Sepulcro de los Siciones' (the tomb of the Sicilians), from a belief that Cinibus and Publius Sicipo are buried under it. Of the Moorish domination there remain no other traces than a large mosque, which was once close to the sea, and which was their arsenal. The cathedral is by far the most interesting building in the city, and is well deserving of attention for its vast dimensions and the elegance and purity of its style. It was built in the year 1117, and has since been greatly added to. The chapel of Santa Thecla, which is entirely built of rich marbles and jasper, is one of the richest and most tastefully decorated in the church. The great altarpiece is much admired for its large size, and the figures in it, which are 34 ft. 14 in. 4255. Tarragona is the see of an archbishop, who once disputed with that of Toledo the primacy of Spain. During the Moorish domination, several provincial and general councils were held there. At the first, which took place in 816,
it was ordained that the Sabbath should commence on Saturday night. The immediate neighbourhood of Taragona is well cultivated, and yields corn, wine, oil, and hemp, in great abundance. The principal manufactures are cloth, coarse cotton-goods, hats, and cutlery, which are exported to all parts of Spain, and to the island of Cuba.

TARSHISH (תֶּרֶשְׁ) is a place mentioned in the Old Testament, particularly in connection with the commerce of the Hebrews and Phoenicians. In Gen., x. 4, the name occurs among the sons of Javan, who are supposed to have peopled the southern parts of Europe. (Compare Ps. lxvii. 10; Joel, lv. 19.) In other passages it is mentioned as sending to Tyre silver, iron, tin, and lead (Ezek., xxvii. 12; Jer. v. 15, 16), and from Jer. x. 10, some have inferred that it was subject to the Phoenicians. The prophet Jonah, attempting to avoid his mission to Nineveh, fled from Joppa in a ship bound to Tarshish. (Jonah, i. 3; iv. 2.) In several passages of the Bible 'ships of Tarshish' are spoken of, especially in connection with Tyre; and it is pretty generally agreed that that phrase only describes a species of large ship, such as those used in the trade with Tarshish, just as we speak of 'Indiamen.'

From a comparison of the above passages, the majority of critics have concluded that Tarshish must be sought for in the western part of the Mediterranean, or even outside the Straits; and it has been generally identified with the Phoenician emporium of Tartessus in Spain, a place which would undoubtedly furnish the products said to have been brought from Tarshish. The Phoenician name 'Tarsish' would easily become the Greek Τάρσης; in fact the Aramaean pronunciation of 'Tarsish' would be 'Tarthesh.' We have abundant proofs that the Phoenicians had established an extensive commercial intercourse with Spain at a very early period.

But there is a considerable difficulty about the position of this Tartessus. The ancient geographers place it, some at the mouth of the river Baetis (Guadalquivir), the most ancient name of which river they state to have been also Tartessus; while others identify it with the city of Calpe, or Cartes, near Mount Calpe, the rock of Gibraltar. (Herod., iv. 152; Strabo, p. 140, 149; Ptolemy, iii. 6; Pliny, iii. 1; Pansan., vi. J. Steph. Byzantium, p. 447.)

The best way to explain and reconcile these statements with each other, and with the biblical accounts respecting Tarshish, seems to be by taking the latter as the name not of a single place, but of the whole country in the neighbour- hood of Gibraltar. In this district there may have been more than one city bearing a name like Tartessus. The name survives in various forms in the names of the neck Calpe, of the neighbouring city Calpe, Carpe, or Carthage (for it is written in Latin words), and of the people Carpetani. This statement will be more clearly understood after a reference to the articles on the letters C. P. and T. In confirmation of this view, Strabo states that the country in the neighbourhood of Calpe was called Tarritus.

Respecting the difficulty arising from the conjoint mention of Tarshish and Ophir in the book of Chronicles, see Owne.

TARSIUS, Storr's name for a genus of Quadrupedia.

Generic Character.—Head rounded; muzzle short; eyes very large; posterior limbs very much elongated, with the tarsus thrice as long as the metatarsus. Tail long.

Dental formula: incisors 4; canines 1-1; molars 6-6 = 34.

Example, Tarsius bancanus. Description.—Dr. Horsfield remarks, that although the Tarsius from Bencana agrees in the essential points with the other species of this genus, he maintains that the features of the head are so much modified in the Tarsius from Bancana, that it had not been discovered, it has no intermediate front teeth, and the exterior tooth on each side is, compared with the other species, very minute. Counting (with Desmarest) one canine tooth on each side, above and beneath, it has, says Dr. Horsfield, only five grinders in each jaw. The head, continues Dr. Horsfield, 'in proportion to the size of the body, is large; the arch of the forehead rises high, and the occiput is regularly spherical. The proportion of disposition and excessive size of the eyes is equally characteristic in this as in other species. The rostrum, or extremity of the face, is short and obtuse; the nose is slightly rounded, almost flat above; and the nostrils, as usual in this genus, are pierced laterally. The ears, which from their erect position and their projection beyond the cranium give a peculiar distinctive character and appearance to the other species, in our animal are disposed horizontally, and instead of rising up are inclined downwards. The crown of the head incline backwards and extend but little from its sides; the lobes, as usual, are very thick, membranous, semitransparent, thinly beset with delicate hairs; several tufts of longer hairs arise from the base, while the interior membranaceous lobes are discovered, but in our specimen too much contracted to admit of a detailed description. The neck is very short, and the anterior extremities have the same proportion to the body as in the other species. The hands are externally covered with a very soft down; internally they are naked, and provided with several rather prominent protuberances, which, according to the opinion of Mr. Fischer, are calculated to assist the animal in climbing. The fingers are deep divided and very delicate; those of the hands have the same proportion, one to the other, as they have in man; on the feet they are more lengthened and slender: the third finger is longer than the middle finger, and the thumb is proportionally short. In all the third phalanx is somewhat thickened, and surrounded by a projecting orbicular border, which, in the thumb particularly, constitutes a delicate ball, supporting the nail. The nails of all the fingers of the hand, as well as of the thumb and the third and fourth finger of the feet, are triangular, and represent a delicate compressed scale: on the index and middle finger of the feet they are erect, sharp, compressed, slightly curved, and not inaptly compared by Mr. Fischer to the thorns of a rose-bush, constituting one of the essential characters of this genus. The body is handsomely formed, and, as in the other species, somewhat contracted towards the pelvis; the lower extremities also have in general a similar character, but the tarsus has less of the extravagant length which is common to the other Tarsis.
The tail has nearly the length of the body and head taken together; it is somewhat thicker at the base, nearly naked two-thirds of its length, but covered towards the extremity with a soft down, which forms, near the tip, a very obscure tuft. The fur is remarkably soft to the touch; it is composed of a thick and very delicate wool, which envelopes the body, head, and extremities, forming a coat of an unequal surface, from which irregular straggling hairs project; at the root of the tail, and at the head and extremities, it terminates abruptly in the form of a ring. The general colour is brown, inclining to grey; on the beast, abdomen, and interior of the extremities it is grey, inclining to whitish: a rufous tint is sparingly dispersed over the upper parts, which shows itself on the head and extremities: the naked parts of the tail near the root are considerably darker than the extremity. (Zoological Researches in Java.)

Locality.—Dr. Hassel at Banca, near Bubo, one of the mining districts, who says, it inhabits the extensive forests in the vicinity.

TARSUS BARBATUS. (Ison.)

M. F. Cuvier remarks that the dentition of the Tarsier approximates the animal more to the Galeopithke, and even to the bats, than to the Quadrupedania. The bones of this genus are well represented in the excellent Osteographie of M. de Blainville.

TARSUS, now TERSOOS, a town on the Cydnus, situated in Isathil, a division of Cilicia, and formerly one of the chief towns of Cilicia. It is about twelve miles distant from the sea, and is in 37° N. lat. and 34° 56' E. long. The traditions about its origin are various. It has been supposed to be the Tarsus of Scripture, but neither Bochart nor Vincent (Famœres of the Ancients) countenances this conjecture. Stephanus Byzantinus (c. Tapoé) says it was founded by Sardanapalus (see the inscription on the tomb of that monarch, Strabo, 672, ed. Cassab.). Annianus, I. iv., c. 24, and Solinus, Polyhista, c. xii., assert that Perseus was the founder (Lucan, iii. 223), and the name Tarsus has been derived both from Pegusas (see the horse Pegasus lost a hoof (Tapoé) there. (Dionys. Perieget., 468, et seq., and for fanciful derivations see Stephanus Byz.) Strabo relates that it was a settlement made by those who accompanied Triptolemus from Argos in his quest of Io (p. 750, ed. Cassab.). The first historical notice of Tarsus after this is in Xenophon, Anab., i. 21, who describes Tarsus as a great and flourishing city when it was taken and plundered by the younger Cyrus, who afterwards concluded a treaty with Syeneus, king of Cilicia, who had his palace there.

We learn from Curtius (iii. 4), that Alexander the Great arrived at Tarsus just in time to save it from being burnt by the Persians. In later times the inhabitants joined the party of Julius Caesar, in honour of whom they took the name Juliaopolis; they were in consequence severely punished by Cassius, and rewarded afterwars by Antony, who made Tarsus a free city. (Dion, 47, 342, 344, ed. Hamb., 1750.) Tarsus enjoyed the favour of Augustus whose tutor Athenodorus, a Stoic, was a native of the place, and provided the district with civil taxation. (Lucian, Macrob., 21, Lib., 1830.) Athenodorus, returning to his native place in his old age, expelled a troublesome faction, at the head of which was Boethus, an unprincipled demagogue, and restored it to its ancient liberty.

Tarsus continued to flourish under the emperors, under whom it assumed the several titles—Iadriana, Constantiopolis, Antiochopolis, Macrinopolis, Hadrianopolis, and finally, in the time of Valerian, Hadriana, Severiana, Antonianna. (Eckehl, 'Arch. Vet., iii. 13.) The Tarsians, according to Strabo, excelled in quickness of repartee and every kind of rustic wit, and their schools of philosophy were not less celebrated than those of Athens and Alexandria. The chief among the Stoics were the two Athenodori; among the Academicians, Nestor. Athenaeus (v., 215, ed. Cassab.) speaks of Lysias, an Epicurean, who was tutor to Tarsus at the time. The cities of this city inform us of its relations with Cilicia and the adjacent provinces. The inscriptions KOINOS KIAIKAES, on a decastyle temple; KOINOS VTO SPHINX, referring to the games common to the three towns bordering on Isauria. Carta, and Lycaonia, and which is found in Monnotel, Recueil de Médailles, iii. That it was a metropolis appears from an inscription on a coin, KINOAUEDES TIXH, and from the testimony of Strabo and Appian's statement that it was a free city is confirmed by the little king KINOEPA. St. Paul was a native of Tarsus (Acts, xvi. 37; and xxii. 23-28.) Other interesting types and inscriptions occur on the coins of Tarsus. On those of Septimius Severus there is SYMBELPA OTTIMA EÚNNEIA, recording his victory over Parthia and Armenia; also a round coin of Tarsus, on which appears the name NEREOPHUS, Apollo, Hercules engaged in several of his labours, Perseus with the harpa, are frequent types, and confirm the testimony of Dion Chrysostom (Orat., 33, 20), who mentions these among the chief deities of the place.

The figure of Triptolemus, the reputed founder, also occurs; and the name BOHOY, referring perhaps to the demagogue of that name. The imperial series extends so low as Gaius, and contains some silver coins, a proof of the great wealth and importance of Tarsus at that time. Syncedemus of Hierocles, Tarsus is placed in the Province Cilicie Prima, and styled Metropon; Constantine Porphyrogenet, after a great resistance. (Dio Cass., iv. 22, 8.) The Haukal, an Oriental geographer, who wrote in the tenth century, thus describes it:—'Tarsus is a considerable town, with a double wall of stone. The inhabitants are valiant men, horsemen, and four thousand foot, and three thousand horse. The city is a pleasant place. From it the borders of Roum are many hills and mountains of difficult ascent. They say that in Tarsus there are above a thousand horses; and in all the chief cities of Islam, such as Sennar, Hejaz, Persia and Khurasan, and Egypt, there are, or public places, appointed for the people of this town.' (Ouseley's Translation, p. 46.)

Tarsus was afterwards taken by the Arabs, but it was wrested from them by the Crusaders, under the commad of Tarsus, the nephew of Bononi, who resigned the conquest to Baldwin, afterwards count of Edessa. (Guibert de Nogent, Histoire de la Première Croisade, iii. bib.; Guizot, Mém. relat. à l'Hist. de France, ix. William of Tyre describes it at this time as a metropolis of Cilicia, with which the Christians and Saracens, and Armenians, much oppressed by the Arabs. Albert d'Aix says that it was populous, and well fortified. In the
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twelfth century Benjamin of Tudela speaks of it as the limit of the Greek empire (i. 58, Asher's transl.), and in the thirteenth, through his apologia of Moslem, the Arabs attempted to recover Tarsus, but failed. (Abulpharagius, p. 160, ed. Pococke, Oxon., 1773.) It was finally taken by Mohammed II., in 1458. (Von Hammer's Geschichte der Gesammten Reichs, ii. 33.)

The city of Tarsus is about 271-2, chiefly Greek, and a few Armenians Christians, governed by a Moslem: its site is unhealthy.

For further information, see Michaud and Poujoulat's Correspondance d'Orient, vi., 146.

TARTAGLIA, NICHOLAS, a learned Italian mathematician, was born about the beginning of the sixteenth century. When he was six years of age his father, who followed the humble occupation of a messenger, or carrier, died, leaving him in indifferent circumstances, without education. Even his family name is unknown, and that which he afterwards took upon himself was given him in derision by his young companions in consequence of an impudence in his speech arising from a wound which he received on his lips from a soldier, when a French army under Gaston de Foix relieved Brescia in 1512.

No account has been transmitted of the means by which Tartaglia obtained a knowledge of the rudiments of science, and it is probable that he owed but little to a preceptor. He cultivated himself seriously, and from his own powers he comprehended the processes of mathematical investigation, enabled him at length to attain the highest rank among the geometers of his time. Having renewed several years as a teacher at Vena and Vicenza, in 1530, he entered the service of the Duke of Gonzaga, and in 1534 he removed to Venice, where he held the like post till his death, which took place in 1557.

Tartaglia wrote on military engineering and on natural philosophy, but it is on his talents as an algebraist that his fame principally rests. In the sixteenth century, mathematicians were sent difficult propositions to each other for solution, as trials of skill; and in the work entitled Quadro ed Invenzioni Diverse, which Tartaglia published in 1535, he has proposed in the circumstances connected with the algebraic questions which he had received and answered. Among these are his investigations relating to equations of the third degree; and the solutions of two cases, in which both the second and third powers of the unknown quantity are given, were shown to have been discovered in 1530, on the occasion of a question proposed by a person who kept a school at Brescia: Tartaglia states also, that in the year 1535, he found the solutions of two equations, in which the first and third powers of the unknown quantity are without the second, while preparing himself for a public contest with Antonio Maria Fiore, who then resided at Venice, and who had challenged him to a competition, in which each was to solve as many as he could of thirty questions, to be proposed by the other. It is added that Tartaglia, in two hours, answered all those of his opponent without receiving one solution from the latter in return.

In 1539, Cardan, who had been informed of the discovery of these solutions by means of a letter, and who was occupied with certain questions which he proposed, in the hope of obtaining from him a knowledge of the processes which he employed in obtaining the roots of equations of the kind just described. The application was made at first through a bookseller, and, after Tar-
products, but principally in bi-tartrate of potash, which is usually called cream of tartar, a salt which is deposited from wine.

The tartaric acid of this salt is obtained first by converting the excess of it, one half of it, into tetrartate of lime by the addition of chalk, and the other half into the same salt, by means of chlorate of sodium; the resulting tetrartate of lime is precipitated by sulphate of potassium, by which sulphate of lime is precipitated, and the solution of tartaric acid thus obtained by single elective affinity and decomposition is evaporated, and crystals of the acid are deposited on cooling.

The properties of tartaric acid are, that it is colourless, inodorous, and very sour to the taste; it occurs in crystals of a considerable size, the primary form of which is an oblique rhombic prism; it suffers no change by exposure to air, as at 50° dissolved in water, and at 212° twice its weight; the solution acts strongly on vegetable blue colours, turning them red, and it becomes mouldy and decomposes when long kept; alcohol dissolves it, but more sparingly than water.

The crystals, when heated a little above the boiling-point of water, melt into a liquid, which boils at 250°, leaving on cooling a semi-transparent mass, which is rather deliquescent; if it be more strongly heated in a retort, tartaric acid is decomposed into pyro-tartaric acid, accompanied with some other products. When very strongly heated in the air, a coaly mass is procured, which is eventually dissipated. Sulphuric acid acts upon and decomposes tartaric acid, with the production of acetic acid; by means of nitric acid it is converted into pyro-tartaric acid, accompanied with a portion of its carbon, by acquiring oxygen by the decomposed nitric acid, is converted into oxalic acid.

Solution of tartaric acid acts with facility upon those materials which are not decomposed water, as iron and zinc; it combines readily with alkalis, earths, and metallic oxides; and these salts are called tartrates. For an account of the more important of these we refer to the respective bases.

Tartaric acid has a remarkable disposition to form double salts, of which the most distinct and remarkable of which is the tetrartate of potash and soda, which has long been employed in medicine under the name of Rochelle Salts. Tartaric acid free from water, in which state it may be obtained by exposure to a heat of 302° in an oil-bath for some time, consists of:

| Two equivalents of hydrogen | 2 or 3 |
| Four equivalents of carbon | 24 . . . 36.4 |
| Five equivalents of oxygen | 40 . . . 60 |

It is insoluble in cold water.

In the crystallized state it consists of:

| One equivalent of anhydrous acid | 66 or 68 |
| One equivalent of water | 21 |

By the action of heat, so as partially to decompose it, tartaric acid is converted into tartaric acid and tartaric acid, which are not of sufficient importance to require description.

Tartaric acid is largely employed as a discharge in calico-printing, and for making what are called sodic powders, which are extemporaneous mixtures of soda-water.

TARTARIC ACID is entirely confined to the vegetable kingdom, and is found free or uncombined in tamarisks, in the urple grape, and in pepper; and in combination in tamarinds, ripes, grapes, gooseberries, mulberries, soursplums, delon, chercomodium vulgaria, in various species of pines, and as tetrartate of lime in the fruit of the Rhus typhina. For medical purposes it should be remarkably pure, when it is used in the form of crystals, but makes a powerful acid impression on the organs of taste. In small doses, properly diluted, it acts as a refrigerant, and is of much value in fevers, particularly malarial, and in bilious remittents. It excites the appetite of persons in whom the stomach is in a healthy condition, and who, by long indulgence in stimulating food and drinks, experience loss of appetite, painful digestion, constipation, with a yellow and altered countenance, and diminished muscular power, find in tartaric acid a remedy of singular power. For this state of system a few crystals should be dissolved in two small tumblers, and drank in the morning fasting, an hour intervening between the tumbler.

A few grains are sufficient for each patient when made too strong it excites irritation, followed by purging. Occasionally it disturbs the nervous system in a distressing way, so that patients refuse to continue its use. This plan has in many instances reclaimed individuals addicted to habitual intemperance, to which they have recourse with a painful feeling, a sinking and craving of the stomach, which is effectually removed by the acid draught. This is also useful after an attack of delirium tremens.

Tartaric acid enters the circulation, and diffuses itself through the whole body, and may be recognised in the urine, generally in combination, often with lime. Tartaric acid is much used to decompose alkaline carbonates, and form effervescing draughts, the employment of which requires no further notice.

TARTARS, or, one collectively, TATARS (Khans and Kipshaks). The name Tatars once denominated a great number of different nations in Middle Asia and Eastern Europe, which, according to general opinion, were of one common origin. Careful research however into the history, language, and ethnographical relations, has shown that the name of Tatars never designated any particular race, although it was at first restricted to certain tribes, among which there was no difference of race. It has however been found that during the twelfth and thirteenth centuries, there entered into this name, the Tatars, the whole of the more important tribes of Eastern Europe, and that it comprehended different nations of Mongol, Turkish, and even Finnish origin. The numerous errors and the inevitable confusion in the earlier historians who have written on this subject can only be cleared up by going back to the period at which the name was first used.

As early as the beginning of the ninth century, the Chinese knew a people called Tata, who lived to the east and south-east of the lake of Baikal, towards the upper course of the Amur River. The name Amur, answering to the Chinese pronunciation of Tatar, and they are probably identical with the Taidjol of the Mongol historian Hsung-Setsen. In the middle of the tenth century the Tatars were divided into three tribes, the White, the Wild, and the Black. The White Tatars lived in the course of the Amur, and were subject to the White, until 1668 (Yessugay), the father of Genghis Khan, a prince of the Water Tatars, subdued the White Tatars, in the middle of the twelfth century. He then united the Wild and all the other tribes of his race; and from that time his descendants, to this warlike nations, the general name of which seems to have been Bede, the name of Khike-Mongol, that is the Blue Bold, or the Celestial Mongols. A particular circumstance made the change of name agreeable to his descendants. The word Tatar is derived from the Mongol language 'a tributary people,' and, in consequence, could not be agreeable to nations which had not only ceased to be tributary, but boasted of the noble title of Mongols. (Stieler's Karte der Welt. History of the East, by W. Schmidt, p. 71, and notes 21 and 22; Pallas, Sammelb., Historischer Nachrichten über die Mongolischen Völker, vol. ii. p. 429; Schmidt, Forschungen im Gebiete der Völker Mittel Alters, p. 59.)

When Genghis Khan sent his son Tushi Khan to conquer the west, all the Turkish nations which were scattered over Middle Asia, from the sources of the Amur to the Caspian, were subdued, and thus became Tatars, that is, tributary subjects of the Mongol empire. Eastern Europe, inhabited by Turks and numerous tribes of the Tatar race, shared their fate; the tributary inhabitants were obliged to fight under a Mongol chief; and the name of Mongols and Tatars were not only confounded, but the latter was well understood, because it designated the great majority of Mongol subjects. In 1223, when the Mongols made their first invasion of Russia, they were generally called Tatars; and when Batu, the grandchild of Genghis Khan, after having laid waste Russia and Poland, arrived by another army, in company with the army of Poles and Germans, and struck with the heroic resistance of the Teutonic knights, that they did not advance any further. This battle was for some time generally called the Tatar Battle: seven Sieben Russian families who survived that day are still called Tartars, because of their armorial bearings, and another, called the knight, whose descendants are still living, had his name
changed in commemoration of the day; but his new name was not Tatars, but Tatars. A further proof of the great numerical preponderance of the tributary nations is, that the subjects of the Mongol empire adopted the name of Tatars as a title of honour, on account of its being the ancient name of the chief tribe of the ruling nation. Klaproth’s opinion has, in this connexion, been supported by Shereefeddin and Arabshah, who tell us that Timur, who, as a descendant of Genghis Khan, undoubtedly belonged to the Mongol race, in a letter to Bayazid, calls himself a Turk, upholding the name among his subjects with being a Turk.

Can we believe that the subdued nations should have distinguished themselves by an ignoble name of their masters, while these, at the same time, made a boast of that of their Turkish subjects? It must be repeated that the tributary nations were called Tatars by the Mongols and by foreigners, and disliked the name on account of its meaning; and that the ethnographical signification of it was supplanted by the general and glorious name of Mongols.

This account of the origin and the gradual diffusion of the name Tatars is more or less different from those given by Klaproth, Abel Remusat, and Schmidt, but it is founded entirely on facts the knowledge of which we owe to these three scholars. The Jenkins of the Crimea, which is described in the above-mentioned works, the reader may consult Schmidt, ir Hammer, Fundgruben des Orient, vol. vi., heft 3; Klaproth, Beleuchtung und Widerlegung der Forschungen des Herrn Schmidt; Abel Remusat, Recherches sur les Tartares; and Bey, De la langue des Tartares; and Remusat, in the Fundgruben des Orient, 1762, 8vo.; Ahmedis Arabisais, Vita et Res gestae Timuri, ed. Manger, ii., cap. 19; Shereefeddin Ali, Hist. de Timour Bey, trad. par Pétis de la Croix, i. v., c. 14.

The above-mentioned Turkish nations were known in history long before they were called Tatars. Part of them founded the empire of Khazaria, between the Dniepr and the Yark.

The Khazars, the Gypsy or Ghazar of Moses of Khorese, inhabited in the time of this Armenian author, in the fifth century A.D., the country north of the Caspian Sea; and in the sixth century they penetrated into the countries north of the Kuban and the Black Sea, where they founded a powerful empire. Among the Byzantine historians, Theophanes is the first who mentions them. As early as A.D. 625 they allied themselves with the emperor Heraclius, and in conjunction with him attacked Anushirvan, the king of Persia. From that time they were in continual political intercourse with the Byzantine emperors; who were always anxious to maintain peaceful relations with this people. Contemporary historians state that the Khazars consisted of two principal races: one of them was Tartar, and the other was Russian; the first being of Turkish origin; the other was tall and handsome, and spoke a Turkish dialect: many other races however were mixed up with them, so that Leo Diaconus justly calls them a "colluvium gentium." (Usseley, Oriental Geography of Ebn Haukal, pp. 185-190; Fraih, Veters Memorium Chazarorum ex Ibn Toullano, s.c.; Mémoires de l’Académie de St. Petersbourg, vol. viii.; Theophanes, i. 25; v. 9.)

Their kings were called Chagan, or more correctly Khagan, which was the name of the old Mongol kings a thousand years before the appearance of the Khazars. In the time of the emperor Constantinus Porphyrogenuity the Khazasian empire extended in the south to the Black Sea, and in the north covered the entire northern part of the Crimea, and the whole of the province of Khazaria until the thirteenth century, and the island of Taman, then inhabited by Goths; on the Caucasian isthmus it was separated from the Alans by the present river of Manych. The western coast of the Caspian Sea belonged to the Khazars, and the eastern boundaries of it, as far as Derbent, were under their present control, but in the time they were contiguous to the Arabs. The eastern boundaries of it were probably the river of Yark or Ural. On the north it extended even beyond Kasan, and on the south it was bounded by the Caspian Sea. In the twelfth century the Khazars made the Russians of Kiew for some time tributary, as well as the Sewerians, the Radiwittes, the Viatitasses, and other Slavonic nations. Constantinus Porphyrogenuity recommends his son to maintain an alliance with the mighty Khazars, but he severely blames his predecessor Leo, who had assumed the imperial dignity.
against the will of the patriarch, and who had crowned his disobedience against the ecclesiastical authority by marrying the daughter of the Khaghan. For this adds this historian, the Khazarai, far from being orthodox Christians, are no Christians at all, but improve Heathens, and Leo was punished for his crime by a carbuncle in his face, of which he died young, after severe sufferings. Christianity indeed, although some feeble traces of it appear in Khazaria as early as 748, was not adopted by the majority of the Khazarians; on the contrary, the Jews were Jewish, and many Jews had founded great families in that country. However strange this circumstance may appear, it is an undoubted fact. According to Früh, one of the best writers on the Khazars, the religion of Moses was practiced by the people, who were expelled from the Byzantine empire at the end of the eighth century. The princes, states Ibn Haukal, were obliged to be Jews, but the nine ministers of the Khaghan might be Jews, Christians, Mohametans, or Heathens, a fact from which we may conclude that there was great toleration in Khazaria. In the subsequent centuries we meet with some Christian princes, such as George Tzuta, in 1016, but the Khaghan Cosco (Khoerew), who reigned about 1120, was the first who had been converted to the religion of Moses by the rabbi Isaac Saccarius, as is stated by the rabbi Judah, in his work cited below, which is dedicated to that king.

(Ibn Haukal; Massoudi, in Silvestre de Sacy, Chrest. Arab. et Pers. div. 2, 264; Bibliothèque Orientale, sub voce khozari; Früh; Leiberg, Untersuchungen zur älteren Geschichte Russlands; Karamzin and Bulgar, Hist. of Russia; Müller, Der Urgeschichtliche Volksstämme; Joh. Butlerius, fl., Liber Corvus, Basileae, 1690, 4to. The last book was on the grand tour in Arabia, by Jeudah Levi, and was translated into Hebrew by Jeudah Abn Tybbon, both Spanish rabbis.)

The Khazars were very different from those barbarous Mongols which afterwards invaded Europe. Although many of them led a nomadic life, they were generally settled in villages and towns, which they embellished with magnificent buildings erected by Arabic and Byzantine architects, and the ruins of which still attest their former splendor. In Roman history, it has been asserted that nothing but navigation nor commerce flourished among them, but there are numerous facts which prove the contrary. In the first place, the number of Jews and the toleration that existed in Khazaria may be considered as certain indications that the Khazars possessed a fine state of commerce. The Khazars were renowned for their fine carpets, which were principally manufactured in their capital, Itele, the present Astrakhan, which was also called Bilibander and Niliah, Serians, name of Seriana, or the palace of the lady; now Tarku, Old Kasan, and Sarkel, a fortress on the Don, were also commercial towns. Honey, skins, leather, furs, fish, salt, copper of the Uril, were the goods they exchanged in the southern countries, for silk, wines, spices, of which they imported to the inhabitants of the north. Gold and silver vessels, which were fabricated in India in ancient times, have been found in our own days at Perm on the Kama, in the north-eastern corner of Russia. The Wolga with its tributary rivers and the Don were the commercial roads by which the communications with the kingdom of Perm, the Biarmia of the old Scandinavian and Anglo-Saxon writers, and with the Norwegians, who, after having subdued North Cape, anchored in the mouth of the Wolga, on the banks of the river, the route used by the Tartars of Kiptshak stopped all intercourse across eastern Russia, and was not re-opened before the end of the sixteenth century, when Jenkinson, an Englishman, discovered it again. Another road followed the Donper as far as Orkhe, and, reaching the Don from the west and the Wolgwokh in the north, brought them into communication with the Baltic, and with Julian, the famous city of the Wendes. The Arabs took a considerable part in this commerce, and their presence in these northern regions is attested by their maps, by their geographers, such as Ibn Fostouk, Massoudi, Sheuseldin, and Yakut, but also by numerous Kufic coins which have been found in Scandinavian, and in the vast country between the Baltic and the Black and Caspian seas. In short, in the period from the seventh to the eleventh century, the Khazars and the Arabs led certain commercial routes in Russia, the natural amity of which was so obvious, that the empire of Bactri
tian Porphyrogenitus, overlooking entirely the trade between the upper part of the Donper and the sources of the Lovat, believed that the Russians of Novgorod, to present Novgorod on the Wolgokh, sailed with their ships, a very thin route to the banks of the Wolga and in the snowy deserts of Siberia. In 1200 Berke sent Noghai, his greatest capital
against Halaku, the Mongol governor of Persia, who assailed independence, but was defeated on the 19th of January, 1333, in a bloody battle on the banks of the Terek, and had a considerable part of his army drowned in crossing across the frozen river. It was on the same year that Marco Polo came to the Golden Camp, other Byzantine stayed for a whole year. Berke, who is generally represented as a prince of great merit, and whose influence in Asia Minor was sensibly felt by the Byzantine emperors, died. The following year was subjugated, and the invasion of Batu. This prince ceded to the Genoese Ion the Crimea, a town which was then one of the great markets where the Tartars used to sell the immense number of prisoners that they made in Russia and Poland, as slaves to the southern nations, and especially to the Sultan of Egypt, who there recruited the body of the Manuks. He sent commissioners into all the subject Russian towns, who sold as slaves all who did not pay the heavy poll-tax imposed upon them by the Tartars. This procedure caused such great misfortune to the remnant of Old Novgorod, that the Germans of Tubek and other Hanseatic towns, in order to save their stores, sent ambassadors with rich presents to Mengku Timur, who reached the Golden Camp in 1329. Mengku Timur Khan (1329-1341) was a Khagan distinct. The reign of Batu was followed by Talaouba, ravaged Hungary and Poland, threatened Germany, and kept up diplomatic relations with France. (Abel Saltans, Mémories de l'Acad. des Inscrips. et B. L., vol. ii., p. 666.)

The following khan was Toktay, whose reign is important in many respects. He assumed, paper-money, on a large scale, and afterwards imitated in Persia, was introduced into kipshak under the name of Jaw, many years before any other thing resembling it was in practice in Batu's kipshak. The kipshak of Toktay was the principal state in the world, and its capital was Chaghatay. (Origin of Paper Money; Von Hammer, p. 222.) Toktay owed his elevation to the throne to Noghai, above-mentioned, a powerful under-khan of the southern Turks of Kipshak, who belonged to the house of Genghis Khan, and became an intimate and trusted minister of the emperor Michael Palaeologus. The power and the influence of Noghai were so great, that he would perhaps have made himself master of Kipshak, if jealousy had not in time, among his sons and led to a civil war, in which Toktay took an active part. A tribe of the Tatars invaded his possessions in 1324, and the young Noghai was defeated and put to death. (M. H. Tatar, Becker, Appendix, p. 190.) In 1327, Toktay, with the assistance of his half-brother, appeared in the Crimea, and in 1328, to the north of the Bielaya, which happened on the 7th of May, 1328, his whole army was slaughtered. Toktay was a successful conqueror of the Russians. Toktamish Khan, the son of Unus Khan, who was the founder of the dynasty of the White Horde, avenged the defeat of Kulikow. In 1383 he took Moscow by storm, and ravaged the whole country. Having concluded several treaties with the Venetians and the Genoese, and Kipshak was in a fair way to recover from all its calamities, when Timur, or Tamerlane, the conqueror of Asia, appeared on the banks of the Yaik. Toktamish was twice defeated by Timur, and in a third battle overthrown, and almost wholly slaughtered by the Tatars. Timur was not satisfied with the destruction of his enemies, but caused them all to be strangled. One of the chief physicians of Timur was strangled, and the whole army was slaughtered. The Khan of Kipshak, however, did not despair: he appeared in the field with a new army, and advanced to meet Timur. The encounter took place near the mouth of the Terek, on the 10th of April, 1386; but notwithstanding their heroic resistance, the Tatars were again defeated, and Timur's host overwhelming Russia. Serai and Astrakhan were destroyed, Moscow was threatened, and saved by the intervention of the Holy Virgin, who appeared on the walls (26th of August, 1386), and Toktamish fled to Witold, grand-duke of Lithuania. Meanwhile Timur had left Kipshak, and his sons, unable to maintain themselves on his destruction, drove out, or were expelled, or otherwise made to yield. Encouraged by the divisions among their masters, the Russian princes paid their tribute very irregularly, and ceased to appear in the Golden Camp and to take the oath of vassalage. In 1490 Ilija Ghino was almost independent in the Crimea. A war was between the khan of Kipshak and Ivan Wassiliwitsch, grand-duke of Moscow, who at last conquered the whole khanat, and took the capital, Kasan, in the autumn of 1448. During this time, Casimir, king of Poland, defeated the Southern Tatars, and when the Great Khan of Serai was bold enough to send missionaries to Ivan to claim the
tribute which was due, the grand-duke refused it haughtily, cut off the noses of the ambassadors, and sent them back in this state to the Golden Camp. He then allied himself with Mengli, khan of the Crimea, and attacked the great khan, who was defeated, in 1480, at the Oka, and near Azof on the Don. This was the last war between Russia and the Greeks, for the next years, under the yoke of foreign masters was master of Kasan; Mengli became an independent khan in the Crimea, and Yaghmurji in Astrakhan. The khan of Astrakhan was conquered by the Russians in 1544. The khanate of the Crimea, although it became a vassal state of Russia, lived for a long time after its capture. The influence of the Tartars upon the Russians has never been better characterized than by that bon-mot of Napoleon: "Scrubb a Russian, and you will find a Tartar." [ASTRAKHAN; CASPIAN SEA; TATARY; TARTARIAN; TARTARIANS; TARTAR; TARTARIA; TARTARIANT.] (Hammer, Geschichte der Goldenen Horde in Kiptshak: Mohammed Riz, Asseb's Seydir (The Seven Planets); Histoire des Khans de la Crimée, traduite du Turk par Mirza-Kasem-Bey, 1832, in 4to.; Abulghazi; D'Osinon Krestov, Geschichte des Kasan-Zare, Petersburg, 1791; Fischer, Sibirische Geschichte, Petersburg, 1788; Deguignes, Histoire des Huns.)

TARTARUS (Γένταχρον) was, according to the notions of the Greeks and Romans, a part of the lower world, and was associated with the light of the sun and to the winds. Homer describes it as being as far below Hades as heaven is above the earth, and as being provided with brazen gates at its entrance. (Iliad, viii. 13, 481.) He further regards it chiefly as the place in which the gods were punished. Hesiod entertains on the whole the same idea, but he adds that Tartarus is surrounded by a brazen wall and triple gate; the roots of the earth and the sea hang down into it. It is the prison of the Titans. (Hesiod, Theog., 732.) The three times Tartarus spoke so that punishe of the lower world in which the shades of the wicked were punished: (Plato, De Re Publica, p. 616; Virgil, Æn., vi. 543), and the ideas then formed of it were more awful than in earlier times. According to Virgil's description, which may be accepted as an example of the later ideas, the road into the lower world was divided at a certain point into two roads, the left of which led into Tartarus, which was surrounded by a triple wall and the fiery river Phlegreth, and was closed with an adamantine gate. At its outer side Thiphon kept watch, and at the inner side the fifty-headed hydra. Rhadamantus was the judge in Tartarus, and at his command the Furies scourged the shades of the wicked. Tartarus was twice as far below the earth as heaven above it.

Tartarus was also the name of a small river in Gallia Transpadana, which is now called Tararo. It was connected with the Padus and Atheosis by the Ponses Philisiums.

TARTARY, or more correctly TATARY. This name was in former times given by the European nations to the country of Kiptshak or Kipshak [TARTARY], or the three Khanats of Astrakhan, Kasan, and the Crimea [ASTRAKHANIA, CASPIA, CRIMEA]. The latter which had the same name, was the name of Little Tartary. [TURKMEN.] Great Tartary, on the contrary, designated the vast country between the Caspian Sea on the west, the desert of Gobi on the east, Siberia on the north, and Persia, Afghanistan, and Tibet on the south, generally where it has not assumed another name of Turkistan. [TURKISTAN.] The name of Tartary has entirely disappeared from geography, but it occurs frequently in the history of those regions.

TARTEMUS. [TARTEMUS.] TARTINI, GIUSEPPE, a name celebrated in the annals of music, was born at Pesaro, on the coast of Italy, in 1682, and educated at the university of Padua, for the profession of jurisprudence; but his love of music triumphed over his grave pursuit, and after some struggles, and several adventures of rather a romantic kind, — among which the fighting of many duels, the marrying a cardinal's niece against her uncle's consent, and his consequent flight to a monastery, where, to avoid the effects of his eminency's resentment, he remained during two years secreted, may be thus slightly mentioned,— and at length, he was recommended to the notice of the chevalier Francesco Trevisani, and of the famous lares and penates in the Musical Society of the King of France, and of the Chevalier de Saint-Georges, who procured for him a patron, and a founder of a school which in after-times bore the name of a Barnabino, a Parma, a Viotti, and a Baillot among its disciples.

Tartini was also a composer, and his productions are much extolled by a very competent judge, M. Balilot, eminent French violinist, and good critic; but is more generally known by his writings on the art, among whose his Trattato di Musica secondo la vera Scienza dell'Armonia (1754), a strictly scientific work, is still read, and as was freely and ably translated, and explained in 1771, by Edward Stillingfleet, under the title of Principles on Powers of Harmony, who cleared it of many of the obscurities which D'Alembert justly complained of, and by his additions and illustrations rendered it entertaining, as well as instructive. This Treatise is partly founded on the opinions of Corelli, which Tartini, not having been so long engaged the attention of all writers on account, and on which most of Tartini's work is built, that he were give an explanation of it nearly in the words of the above-mentioned author, as he, or rather, as Tartini says: "Two sounds being given on musical instruments, the admit of the tones being held out and strengthened at pleasure, as violins, oboes, horns, &c., a third sound will be heard. On the violin let the intervals e, e, &c., be sounded with a strong bow, and the new sounds, represented by the black notes in the subjacent example, will be heard:—

\[ \text{\textit{A similar result will occur if the same intervals are sounded by two players on the violin, distant from each other about 29 or 30 feet; always using a strong bow, and holding out the notes. The audior will hear the third sound much better if stationed exactly between the two players. Tartini made use of the same effect to place his music at a much greater distance.}} \]

"This discovery of the Grave Harmonics, as these the sounds are called, was made so nearly at the same time by Tartini and Romieu, that both seem to have an undoubted claim to be the discoverers. M. Romieu was a member of the Royal Society of Sciences of Montpellier The memoir which he read before the society is entitled "A New Discovery of Grave Harmonic Sounds, which are very delightfully produced from the union of Wind Instruments."

Tartini died at Padua in 1770. To the Dictionnaire de Musiciens we are indebted for what relates to his early life, which work also furnished M. Prony with materials for an interesting memoir in the Bonaparte, or Gazette des Sciences. In the Encyclopédie is an article by M. Girouard, on the compositions of Tartini, in which they are most indirectly compared with those of Corelli.

TARTARY. 1723. [TARTARIC ACID.] 1772. [MARCOCCHI.] TASHKEND. [TURKISTAN.] TASMAN, ABEL JANSSEN, one of the greatest navigators of the seventeenth century, whose fame has not yet faded, owing to his countrymen, the Dutch having neglected to make known his letters, which he rendered to geography. In the service of the Dutch East India Company he gave such proof of his enterprise and ability as to induce Anthony Van Diest, the most distinguished of governor-generals who had presided over the affairs of that company, to commission him in 1642, to proceed on a voyage, the object of which was to ascertain the extent of the Australrian continent, on the western coast of which discoveries had been made by previous navigators.

On the 14th August, 1642, Tasman sailed from Batavia to Asia.
In command of two vessels, the Heemskirk and the Zeehaen, directing his course first towards the Isle of Flatangerland, T Tasman sighted that island on 9th of October, and passed it in for coaling and water. From the Isle of Flatangerland he set sail on the 30th October, and proceeded south to about 41° S. lat., afterwards to the south-east, to about 50° S. lat., and then due east. Having passed 122° E. long., he sailed to the north and east, and on the 13th, being in about 42° 10' S. lat. and 170° E. long., he found himself in view of a high and mountainous country, which he named Staaten Land—land of estates—now known as New Zealand. Tasman also named the islands which he happened to sail by on the 18th, being in about 10° 20' S. lat. and 170° E. long., the name of Morden's Bay, or Murderers Bay (40° 40' S. lat., 173° E. long.). Tasman did not revenge the death of his men, but, availing himself of a favourable wind, set sail. Being followed however by two or three canoes which chased him, killed one or two natives, and drove the rest on shore. He did not make any progress owing to the variability of the weather, and was obliged to anchor again in a bay to the east of Mas- sandervaart. After the 27th of November Tasman's Bay (about 41° S. lat., 173° 30' E. long.). When enabled to resume his voyage, he continued his course along the coast, bearing northwards, until, on the 4th January, 1643, he found himself in a situation in which the view of the various articles of industry presented the appearance of the waves, which bore to the north-west, led him to conclude that the sea in that part afforded a free passage. To the west he perceived a group of small islands which he named the Three Kings (in about 34° 3' S. lat., 172° 5'E. long.). Those islands were inhabited, but the violence of the waves prevented all intercourse with the natives. Tasman now resolved to sail to the east, and afterwards to the north as far as 17° S. lat., and then to the west towards the isles of Cocos (13° 50' S. lat., 175° 10' W. long.), and of Hoorn (14° 4' S. lat., 178° 20' W. long.), with a view of obtaining some fresh provisions at one of these islands. On the 6th January he saw an island to the south at three miles distance, but no name is given to it. On the 9th, being in about 32° 3' S. lat. and 174° E. long., the force of the waves which rolled from the south-east suggested to him that he ought not to look for land in that direction; he therefore changed his course to the north, and passed the island of the Pyllansart (22° 22' S. lat., 176° W. long.). On the following day he saw two other islands, and on the 21st approached the more northern, which he named Amsterdam, the native name being Aan Moka or Annamooka, 23° 15' S. lat., 174° 31' W. long. Captain Cook, when he visited these islands about one hundred and fifty years afterwards, found the tradition of Tasman's visit preserved among the natives.

On the 1st of February Tasman discovered the islands of New Zealand. At Prince William Sound he found the natives having nearly exhausted, he could not stay to visit them for several days subsequently the sky was so cloudy as to prevent his ascertaining the situation of his vessel, and when fine weather partially returned, he judged the wisest course was westward towards New Guinea, apprehending the return of unfavourable weather, in which he might be cast upon an unknown coast. By the 22nd of March he was in 5° 2' S. lat., and having the advantage of clear weather and the east trade-winds he soon came into the channel of islands which had been visited by two navigators, Schouten and Le Maire, and by them named Ontlang Java. On the 29th he sailed past the Green Islands (4° 58' S. lat., 154° 50' E. long.), and the 30th the Island St. John (3° 50' S. lat., 153° 50' E. long.). This island, he says, appeared to be well cultivated, to abound in flesh, fowl, fish, and fruit, and to have a numerous population. Schouten having before sustained some injury from the natives, Tasman attempted to come to an understanding with them. April he was in sight of what he supposed to be New Guinea, but in fact of New Britain, and shortly after he doubled the cape to which Spanish navigators had given the name Santa Maria—Cape St. George, or Dampier's (5° 55' S. lat., 132° 15' E. long.), and was suddenly awoken on the night of the 12th by what resembled the shock of an earthquake: the situation of the vessel at the time, as Tasman states, being 3° 45' S. lat. They sounded, supposing that the ship had struck, but could find no bottom. Several shocks, each less violent, succeeded. On the 20th they were near to Brandynd Yland, or Burning Island, which had been mentioned before by Schouten: on the 27th they were in sight of another island, which was named in the east of Moa (8° 21' S. lat., 127° 45' E. long.), where they obtained cocoa-nuts and other fruits. Tasman has described the inhabitants as absolutely black, and speaking a copious language, in which the frequent repetition of the word Land was evident. He anchored the following day at the Isle of Moa, where he was detained for eight days by unfavourable weather. The Dutch carried on an interchange of knives for cocoa-nuts and Indian corn. On the 12th he passed the island to which Schouten had given his name (50° S. lat., 138° 20' E. long.), and which is described as fertile and populous: the natives gave proof of their commerce with different Spanish vessels by the production of the articles which they brought. Having now fulfilled his instructions, Tasman directed his course back to Batavia, where he arrived on the 15th June. A map of his discoveries was sent to the Stadt House at Amsterdam.

The success of this voyage induced Van Diemen to commit to Tasman the command of a second expedition, the objects of which are set forth in the instructions given by the governor-general on the occasion. These instructions are printed in the introduction to Flinders' Voyages. After quitting Point Ture, or False Cape, situated in 5° S. lat., on the south coast of New Guinea, he was to continue eastward along the coast to 9° S. lat., carefully crossing the cape at that place, looking about the high islands or Sprueltis River with the yachts for a harbour, despatching the tender De Breuck for two or three days into the cape, in order to discover whether within the great inlet there might not be found an entrance to the South Sea.* From this place he was to coast along the west coast of New Guinea, 17° S. lat. to the high islands or Sprueltis River, 17° 51' S. lat., following the coast farther, as it might run westward or southward. It was feared that he would meet in those parts with the south-east trade-winds; from

* The great inlet or cove where the passage was to be sought, is the north west part of Torres Straits. It is evident that a suspension was entertained in 1641 of such a search; but that the Peron were ignorant of its having been

The great inlet or cove where the passage was to be sought, is the north west part of Torres Straits. It is evident that a suspension was entertained in 1641 of such a search; but that the Peron were ignorant of its having been passed. The high islands are those which lie in 10° S. lat. on the west side of Torres Straits. Speculation being open to the Prince of Wilesland and Cape York; through which Cook afterwards passed, and named Endewarde Coast. (Flinders' Voyages, Introduction.)
which it would be difficult to keep the coast on board, if he stretched to the south-east; but notwithstanding he was by all means to endeavour to proceed, that it might be ascertained whether the land was divided from the great known Southern Continent or not. These instructions were signed in 1644, 29th January, by the governor-general, and two vessels—the Zeewaaen and the Braak—were placed at Tasman's disposal. But of the results of this second voyage absolutely nothing is known with certainty; the 'An eyes has been the general opinion,' says Flinders, 'that Tasman sailed round the Gulf of Carpentaria, and then westward along Arnhem, and the northern coast of Van Diemen's Land; and the form of those coasts in Thévenot are given, and in those of most succeeding geographers, even up to the end of the eighteenth century, is supposed to have resulted from this voyage. This opinion is strengthened by finding the names of Tasman, and of the governor-general, and of two of the council, who signed his instructions, applied to places at the head of the gulf; as also is that of Maria, the daughter of the governor, to whom Tasman is said to have been attached. In the notes also of Burgomaster Walckenaer of Amsterdam, in his 'Inhabitation of Hollandia Nova,' as extracted by Mr. Dalrymple ('Collection of Voyages,' Tasman is mentioned as among those from whom his information was drawn.' Of the private life of Tasman nothing is known, neither when nor where he was born.

An account of Tasman's first voyage is given in the 'Collection de Thévenot, partie iv.; in Harris's Navigantium atque Itinerarium Bibliotheca, 1744, fol.; at the end of the 'Voyages of Dampier.' 'Itinerarium,' 'Cursus, or Voyages to the Terra Australis during the Sixteenth, Seventeenth, and Eighteenth Centuries, by Callander, Edin., 1766. From these sources, and from the 'Biographie Universelle,' tome 66, the substance of this article has been collected. Tasman is named in many authors, and in many other universal biographies in the English language.

TASMANIA, more generally known by the name of Van Diemen's Land, is an island and British colony situated in the southern hemisphere, south of Australia, between 40° 45' and 45° 45' S. lat., and between 144° 45' and 149° 30' E. long. It is separated from Australia by Bass's Strait, which washes its northern shore. On the west of the island is the Indian Ocean, and on the east the Pacific Ocean. The strait is washed by the currents of the ocean which connects the two first-named oceans, and extends southwards to the shores of the newly-discovered antarctic continent. [SOUTH POLAR COUNTRIES.] From Cape York the western extent of the continent extends south-east to South Cape, a distance of about 230 miles, and this is its greatest length. Its greatest width occurs near 41° 20' S. lat., between Ormance Point on the west and St. Helen's Point on the east, which is about 180 miles distant from one another. According to a rough estimate, the surface is 24,000 square miles, or about 4,000 square miles less than the extent of Ireland.

Coast-line and Islands.—The western coast, beginning on the north at Cape Grim, and extending to South-West Cape, is about 240 miles long. It is less accessible than the other shores of the island, as in general it runs in a continuous line, being only broken by large inlets at two places. The shores are steep, exposed to the prevailing south-western winds and weather. They have good anchorage and shelter. This coast is therefore rarely visited by vessels, and no settlements have been established on it, except at Macquarie Harbour and Port Davey, where a few convicts are kept to cut wood. The northern parts of this coast, and as far south as Macquarie Harbour, are in general low, but south of Macquarie Harbour they are high. South of Cape Grim, which consists of steep rocks of moderate elevation, the coast is formed by low black rocks, washed by the waves of the southern ocean, which sink to a low level of the sea, and in this part there are a few shallow coves.

South of Port West Point, which is formed by a short, low, and sandy projection, to the mouth of the river Arthur, the beach is low and sandy, and behind it extends a swampy level tract, continued as an entrance to the district, a distance of three or four miles, where the country rises into low hills. At a few places the low beach is interrupted by rocky cliffs. This low coast continues to Ormance Point, near which is Jacob's Harbour, which is accessible to boats. At Ormance Point the coast rises to a moderate elevation, but it is frequently interrupted by low and sandy tracts. The shores are overgrown with low bushes. A bay of moderate size extends between the mouth of the river Pedder and Sandy Cape, but it is shallow and useless. That part of the coast which extends from Sandy Cape to Macquarie Harbour is almost unknown, except that it chiefly consists of sandy low shores, without a beach, at the few places where the waves break, the land rises to a considerable elevation. Macquarie Harbour is a fine sheet of water, extending nearly 25 miles south-south-east, and terminating with two fine basins, Birch's Inlet and Kelly's Basin. It is on an average five miles wide, and contains water 60 feet deep. The entrance to this bay is a bar, which has only nine feet of water. The harbour is surrounded by wooded hills. Cape Stowell, forming the western side of the entrance of Macquarie Harbour, is a steep and rocky promontory, and farther south the coast line is high and rocky, and here and there a few rocks project into the sea, but the small bays thus not afford shelter against the swell of the sea, and not even a safe landing-place. At the back of the beach there are several extensive fells, as Cape Stowell, which has a considerable name. Cape and Rocky Point two hills, which project about two miles from the shores, constitute a harbour, in which small vessels can find anchorage. It is also believed that the small islands continue to Port Davey and to South-West Cape. Port Davey is the best harbour on this coast. At the entrance it is about four miles wide, and it continues at that point to Sandy Cape. That branch which runs northward is called Cockburn, and is about two miles wide and six long; the southern, which runs eastward, does not much exceed a mile in width, but extends more than 10 miles inland, turning at the largest break of land. This branch have good anchorage, and afford safe shelter, being surrounded by high hills; but the wide bay, of which they are branches, is open to the westerly winds and the swell of the sea: the anchorage however is good.

The coast extends from South-West Cape and Whole Head, is about 50 miles long, and runs in a serpentine line, forming several bays, of which a few have good anchorage, as Cox's Bight, east of South-West Cape, and the nameless wide bay which lies west of South Cape. Most of the bays on this coast are about two miles in width, and about 10 miles in length, and have good anchorage and shelter. This coast is separated from the wide bay by a range of hills, which rise to a moderate height, the sea breaks with a heavy surf. The shores of this coast are in general rocky and high, and constitute the lower declivity of the mountain-masses which extend over this part of the country. Several small islands opposite this coast break the swell of the sea, and as most of them are elevated, they serve as beacons.

The south-eastern coast extends from Whole Head, the most south-eastern promontory of Tasmania, to Cape Frederick Hendrik, about 60 miles in a straight line, but measured along the shores, it is probably double that extent. It contains a greater number of safe anchorages than probably any other country of the same extent in the globe. There is hardly a mile along this coast-line which is not accessible to the smallest vessel. This great advantage is owing partly to the nature and shape of the island of Bruni, which extends along the coast, and partly to two far-projecting promontories, called Ralph's Peninsula and Tasman's Peninsula. The island of Bruni extends from Cape Grim nearly due south, and north, but it varies greatly in width, as the isthmus of St. Aignan is only a few hundred paces across, whilst the mountain tract south of it is more than eight miles wide. It consists of three isolated tracts of high hills, connected by isthmuses, of which the highest tract has the form of a hook, and is connected with the central mountain-tract by an isthmus about a mile wide and two miles long, which separates Taylor's Bay from Bad Bay. This isthmus is about five miles long, and extending on the western side of the same, is extremely narrow. The coast, constituting the main body of the island, is about 15 miles long from south to north, and is more than eight miles wide in the broadest part. It is connected with the northern mountain-tract by the isthmus of
St. Aignan, which is five miles long, and only a few hundred places wide. It is low and sandy, and separates Isthumus Bay on the west from Adventure Bay on the east. The northern mountain-tract is about 12 miles long, and so much indented on the west side that its average width does not exceed three miles, though in some places it is five miles across. The mountains of this island do not appear to exceed 1200 feet in elevation: they are covered with wood, and the top is flat, sterile, and covered with peat. The southern side of the island is five harbours, which, from south to north, are called Great Cove or Taylor's Bay, Little Cove, Isthumus Bay, Great Bay, and Burnes Bay. They all have excellent anchorage and shelter, except Taylor's Bay, which is exposed to violent gusts of wind which come down from the mountains on the mainland. On the eastern side of Bruni Island are three bays, Bad Bay, Adventure Bay, and Trumpeter Bay. Bad Bay is useless, being open to the southern winds, and subject to a very heavy swell, which causes such a tremendous surf at the foot of the rocks which surround the basin, that landing is almost impossible. Adventure Bay and Tasman's Bay to the east, but is so far protected by Tasman's Head the inconveniences of this harbour due to the fact that it is frequently visited by large vessels, and extends 45 miles in a straight line from the extremity of the island; it has excellent anchorage, and with a convenient depth of water, and is sheltered by high hills. It is eight miles long, and the width varies from three to five miles. It is free from all danger, and branches out into numerous coves. This bay is surrounded on three sides by Tasman's Peninsula, and constitutes one of the nearest harbours on the island: it has excellent anchorage, with a convenient depth of water, and is sheltered by high hills. It is eight miles long, and the width varies from three to five miles. It is free from all danger, and branches out into numerous coves.

Tasman's Peninsula extends about 25 miles from south to north: it consists of two larger peninsulas, of which the southern is properly called Tasman's, and the northern Forester's Peninsula. Tasman's Peninsula surrounds Norfolk Bay on the east. It is about 150 miles long, with an average width of eight miles. The surface of this tract is covered with mountains, which rise with a steep ascent from the water's edge, and are mostly barren. It is separated from the eastern part of the island by a narrow strait, called East Bay and Fortesque Bay. On the west side of the peninsula, on the east shores of Storm Bay, is Wedge Bay, which has tolerably good anchorage. Maingon Bay, on the south coast of the peninsula, is quite open, but on the north it leads to a safe harbour, Port Arthur, which extends more than six miles inland, and is more than a mile wide. The high rocky isthmus which divides its northern extremity from Norfolk Bay is only three miles wide. On the eastern shores of Tasman's Peninsula is Fortesque Bay, which is large, and has excellent anchorage, but is open to the east. Pirates Bay, farther north, is still more open: it is separated from Norfolk Bay by an isthmus called Eagle Hawk Neck, which is only 600 feet wide and 700 feet long, and which is divided by a small cove. Norfolk Bay consists of two mountainous tracts united by a low isthmus. This isthmus is only half a mile wide, and is the place where Ralph's Bay approaches nearest to Frederick Henry Bay. This last-mentioned bay, which has also the name of North Bay, or du Nord, north to Storm Bay by a channel situated between Ralph's Peninsula and Tasman's Peninsula, which is five miles long and five miles wide. The bay itself consists of three basins, North Bay, Pitt Bay, and Northerly Arm. Pitt Bay occupies the centre, is a basin about eight miles long from north to south, and six from west to east. It has good anchorage, with sufficient depth of water, and is generally well sheltered. Along its northern shores there is a low and sandy tongue of land, with a small cove, which leads to Pitt Water, an arm of the sea extending from east-south-east to west-north-west about eight miles, with an average width of two miles, which branches out into numerous small coves and inlets affording safe anchorage for small vessels, but the entrance has only sufficient depth for them. Norfolk Bay lies to the east of North Bay, with which it is connected by a channel about three miles wide. This bay is surrounded on three sides by Tasman's Peninsula, and constitutes one of the nearest harbours on the island: it has excellent anchorage, with a convenient depth of water, and is sheltered by high hills. It is eight miles long, and the width varies from three to five miles. It is free from all danger, and branches out into numerous coves.
Prosser’s Bay begins towards the south, is about three miles wide at its entrance, and extending in two arms five miles inland. There are several rocks in it, but nothing of particular interest except the large anchorage on the northern arm. Between Prosser’s Bay and Cape Bailey the coast is high, rocky, and well wooded. At Cape Bailey begins Oyster Bay, the largest of the bays of Tasmania: it is 18 miles long from south to north, and 15 miles wide at the entrance; this bays is narrow generally, but open in its northern recess 10 miles across. It contains good anchoring-ground, and is tolerably safe, for though it is open towards the south, the island of Maria and several smaller islands in that direction break the swell of the sea. The entrance is well marked by a rocky point and a half-mile wide, on which is a small fresh-water lake. To the west of this neck is Refuge Bay, and to the east Thoun Bay. The first is a safe harbour, but the second is open and rocky. Beyond this are several fine sandy necks about three miles long and a mile wide connects Vanderlin’s Peninsula with the main body of Tasmania. The mountains of the southern part of Vanderlin’s Peninsula are the highest in the peninsula. Schouten’s Island is separated from that peninsula by Geographical Strait, which is nearly three miles long, and about one mile and a half wide on an average: there is good anchorage in the strait. Schouten’s Island has nearly the form of a square, and extends about four miles in every direction. On its southern side, in Faure Bay, there is anchoring-ground. The island consists of a sandy rock, descending on the east with a steep declivity to the water’s edge, but on the west with a gentle well-wooded slope.

The coast of Tasmania is the best on which a man can anchor, with the exception of some sandy bays at and between East and West Double Sandy Points, and the high cape of Stony Head, which consists of several rocky masses overgrown with grass. The shores are either entirely barren or covered with a few low places, and broken by small swamps, and in others some flat and low rocks of small extent. The bays have in general sufficient depth of water and good anchorage-ground, but being wide and open, they do not afford security against winds and the swell of the sea. The largest is Kingaroy Bay, west of Cape Portland.

Port Dalrymple is the best harbour on the northern shores, though it cannot be compared with the harbours on the south-eastern coast. Before its entrance on the west is the dangerous reef called Heces Reef, and even on the sea-reach, which is two miles wide and six long, there are some shoals. The navigation is tedious and difficult, but the Tamar is deep enough for large vessels as far as the Tamar Falls, which cannot be ascended above this point on the tide. West of Port Dalrymple the coast is high, being formed by elevated and wooded hills, the highest of which are the Asbestos Hills. To the west of these hills is Port Sorell, which is rather spacious and has good anchorage, but not of any consequence. They are followed by Cape Tephra, which is a large head opposite to Great St. Bernard’s and Hog’s Heads, which are situated at the mouth of the Leven river. From these heads to the cape of Portland the coast is generally rocky and high, but intersected by the mouths of several rivers, which however do not admit even boats, except the Leven, which is navigable from the sea to the mouth of the river. This cape is rounded, with a long and flat bay, and the coast terminates in a sandy beach. From Portland Point to Round Head the coast presents an alternation of high and low shores. The low shores are sandy or swampy, and generally covered with more elevated, but tolerably well wooded. Between Eddy-Point and Cape Portland the shores consist of a low tract of considerable width: the soil is sandy and of indifferent fertility. The woods which cover it consist of short, coarse, and unmanufactured timber, especially on the coast is beet with shingles, and cannot be approached with safety.

The northern coast of Tasmania extends from Cape Portland on the east to Cape Grim on the west, and is about 160 miles long in a straight line, but following the coast line is about 540 miles. The breadth of the coast is Bass’s Strait, at the eastern entrance of which is the group of the Furneaux Islands, which consist of two larger islands, four of moderate size, and many smaller islands. The larger, Great Island, extends 40 miles in length, and some of the smaller is about 10 miles long, so that its surface may be estimated at 300 square miles, or somewhat more than that of the Scotch island of Islay. The interior of the island is mountainous, and the mountains advance on the west side to the sea, and there are two tracts of low ground along the eastern shore, which is sandy and in some places swampy. South of Great Island is Cape Barren Island, which extends from east to west about 20 miles, with an average width of about five miles, and contains a number of small islands. The eastern coast is low, and consists of a sandy shore, which is generally free from dangers. The current which runs through it is moderate.

The coast from Cape Portland on the east to Port Dalrymple is the most difficult to navigate. Before its entrance on the west is the dangerous reef called Heces Reef, and even on the sea-reach, which is two miles wide and six long, there are some shoals. The navigation is tedious and difficult, but the Tamar is deep enough for large vessels as far as the Tamar Falls, which cannot be ascended above this point on the tide. West of Port Dalrymple the coast is high, being formed by elevated and wooded hills, the highest of which are the Asbestos Hills. To the west of these hills is Port Sorell, which is rather spacious and has good anchorage, but not of any consequence. They are followed by Cape Tephra, which is a large head opposite to Great St. Bernard’s and Hog’s Heads, which are situated at the mouth of the Leven river. From these heads to the cape of Portland the coast is generally rocky and high, but intersected by the mouths of several rivers, which however do not admit even boats, except the Leven, which is navigable from the sea to the mouth of the river. This cape is rounded, with a long and flat bay, and the coast terminates in a sandy beach. From Portland Point to Round Head the coast presents an alternation of high and low shores. The low shores are sandy or swampy, and generally covered with...
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The coast is a tongue of land projecting into the sea at a distance from the mainland of about seven miles from the mainland. Its northern portion is an undulating table-land resting on basalt columns, whose surface is covered with large, smooth, and overgrown with trees. There is no harbour for ships on the coast, except at the mouth of Emu river, where small vessels find good anchorage in Emu Bay. Boats from the port of Hobart, not far from Emu Bay to the west, and Pepply Bay, west of Rocky Cape, a rather elevated rocky mass projecting into the sea.

Circular Head is a tongue of land projecting into the sea at a distance from the mainland of about seven miles from the mainland. Its northern portion is an undulating table-land resting on basalt columns, whose surface is covered with large, smooth, and overgrown with trees. There is no harbour for ships on the coast, except at the mouth of Emu river, where small vessels find good anchorage in Emu Bay. Boats from the port of Hobart, not far from Emu Bay to the west, and Pepply Bay, west of Rocky Cape, a rather elevated rocky mass projecting into the sea.

Circular Head has a small indent of land, which, however, extends no more than two miles across in the widest part. It is united to the mainland by a low sandy isthmus nearly three miles long and about one mile wide. On each side of this isthmus is a tongue of land, which advances four or five miles into the sea, and forms two harbours, called East and West Bay, which have sufficient depth for small vessels. The advantages afforded by these two harbours, and the pasture-ground on Circular Head, have induced the Van Diemen's Land Government to encourage settlement there. The coast from Circular Head to Cape Grim is low and sandy. In some places there are swamps overgrown with tea-trees. It is lined by numerous shoals, but though there are several islands, none of them has sufficient depth of water for a boat.

North of this coast-line are the Hunter Islands, a group consisting of three larger and several smaller islands. Balloon Island, the nearest to the mainland, is divided into two parts, one of which is a low, sandy island, with a stretch of shoal, but has good anchoring-ground near the eastern entrance. The island is about 7 miles long from east to west, and 5 miles wide on an average. The eastern portion, embracing about two-thirds of the whole, is low, and has a sandy beach on its eastern side; it is also pasture-ground. The western district is a rocky ridge, covered with heath. Three-Hummock Island is about the same size, but it is hilly, and chiefly covered with bushes, low trees, or grass. To the east of this island is a cove, with small anchoring-ground, and an indifferent anchorage. West of Three-Hummock Island is Barren Island, which is the largest of the group, being 15 miles long, and on an average 4 miles wide. It is likewise rocky in its whole extent, but less elevated than the other islands. To this island this river 42° 50' S. lat. extends its course, which has been named the Tamar.

The coast from Circular Head to Cape Grim is low and sandy. In some places there are swamps overgrown with tea-trees. It is lined by numerous shoals, but though there are several islands, none of them has sufficient depth of water for a boat.

The Unexplored Mountain-Region, south of 42°, occupies the southern and western districts of the island, and reaches north-east to the banks of the river Derwent. This river, from its source in Lake St. Clair to its mouth, occupies the well-known part of the island from which it is entirely unknown except the coast and the districts in the immediate vicinity of the river. These districts are marked by an unbroken range, which extends along the river at a short distance from its banks, and in some places sends off branches which advance close to the river. This range is sometimes called the Table-land, although it is by no means continuous, and is obtained any other name. It begins on the estuary of the Derwent, opposite the entrance of the river, but from that point it extends north-west to Mount Wellington, which is a few miles west of Hobart Town, and rises, according to Darwin, 3100 feet above the sea. Farther on, the range, which occupies a width of perhaps 20 miles, does not seem to contain many summits which rise above the level of the sea. The Derwent is not connected with the sea in several places, but in several others it is by means of an impenetrable forest, it hitherto been impossible to determine the extent of a range which extends for many miles along the southern coast, and in several places of considerable extent occur on the top of the range; but as the whole of it is covered with an impenetrable forest, it has hitherto been impossible to determine the extent of this range. The coast, which forms an arm of about 20 miles round Lake St. Clair, on the south of the island, is also connected with the sea, and it is from this arm that the island is symmetrical with the northern, and that it constitutes its northern extremity. At the southern extremity of the range is a large peninsula, formed by D'Entrecasteaux Channel and the estuary of the river Huon, the whole of which is covered with high hills, clothed with dense forests to their summits, and broken only in a few places by valleys, which exhibit a great degree of fertility, but in which no settlements have yet been made.

The remainder of this region is only known so far as it has been observed from the sea and a few places from the coast. The most striking feature of this district is a mountain-range which extends a distance of about 2000 miles from the southern coast, and which appears to extend without interruption to the eastern part of Port Davey, called Bathurst Harbour, to the vicinity of Port Refuge, at the entrance of D'Entrecasteaux Channel. This land is higher than the coast, but is without wood. Some parts of it are very rocky, and are accessible only by means of small boats. By means of its southern coast and the islands which lie near the western shores. A few open plains of moderate extent are also found near the banks of the Huon, where the river runs eastward; but farther down the whole country is covered with impenetrable forests. This land is not so high as the coast, and is covered with large, open, and grassy plains of considerable extent. The forests, which cover this region almost without interruption, consist chiefly of different kinds of Eucalyptus, especially Eucalyptus globulus, and different kinds of pines, among which Tasmania and many tree-like firs are frequently met with.

The Valley of the Lower Derwent extends from Mount Nelson upwards to the confluence of the Derwent with the Ouse (near 42° 35' S. lat.), and is rather more of 60 miles long, measured along the bends of the river. The Derwent runs close to the range of high mountains which extend along its western banks; and the space between the banks of the river and the base of the steep rocky mass rises a mile or more, and is so continually undulating that it appears as if it were a hill that encloses the valley which extends to the east, and to the north. The surface of this part of the valley is level near the banks of the river, and subject to inundations; but at a short distance from them the ground rises into gentle undulations, on which some small hills are met with. The soil of this tract appears to be generally of first-rate quality; it produces rich crops of wheat, and is well adapted to orchards. Cultivation is rapidly spreading over this tract.

A Hill to the north-east of the Lower Valley of the Derwent. It extends eastward to the shores of the Pacific, and northward nearly to 42° 35' S. lat. The surface of this tract is a continuous succession of hill and dale. The tract...
valler no sooner arrives at the bottom of one hill than he has to ascend another, often three or four times in the space of a mile. In some places the land swells into greater heights, which have several miles of ascent. Except the valleys, which constitute the bottoms of the numerous rivers which traverse this region from north to south, and which are generally of moderate width, the level tracts, either marshes or plains, are comparatively few. The most elevated part of this region appears to be a Wright of Table Mountain, a summit standing near the south-eastern extremity of Lake Sorell, whose elevation is estimated at 3800 feet. The ridge branching off from it towards the south is of moderate elevation, but the country between the hills is sometimes too steep for cultivation, and they are generally covered with thick woods. But even where the declivities are gentle, which is most frequent, 'tis the case, the soil is too dry. The declivities, and also the lands lying near the rivers where small levels frequently occur, are overgrown with open forests without underwood, under the shade of which there is grass nearly all the year round. These hills afford excellent pasture for sheep and cattle. This description applies to the region lying between the north and south forks of the Huon, and the north portion of the coast in the north of Norfolk Bay, and which appears not to have been explored. That part of it which lies along the Pacific consists only of rocky masses, frequently destitute of woods and bushes, and in other places overgrown with eroded and stunted vegetation.

The Elevated Plains are north of the Hilly Region, and extend from 42° 38' to about 41° 50'. They are separated from the Pacific by a higher tract, called Eastern Tier. This tract begins on the south near 42° 38', where it is about 10 miles from the coast, and extends to the plains of the South Eak, to which it descends with a steep declivity. It increases in width as it proceeds farther north, and on the banks of the South Eak it is more than 80 miles from east to west. This region also is entirely unknown, and is a blank on our maps. We can find no information respecting its character and capabilities. The heights which extend along the sea are very scantily wooded, and do not present a promising aspect. The plains themselves are destitute of woods and bushes, and, according to our notions, too hilly and wooded tract, which crosses them in a diagonal direction from south-east to north-west, beginning on the Eastern Tier with the Blue Hills, south-east of Oatlands, is a plain east of that township to Table Mount, and the other heights surrounding Lake Sorell, and hence to the range of mountains called the Western Tier or Western Mountains, from the southern extremity of which it is divided by the upper valley of Lake River. Farther west the Western Tier constitutes the northern boundary of the southern plains. These southern plains are distinguished by many large lakes. The most western of these lakes is that of St. Clair, the source of the Derwent river. It is about ten miles long and three miles wide on an average, and is divided by farthingales farther south into the shape of an alpine lake and being surrounded by mountains. The country east of the lake St. Clair is not included in the plains, being very mountainous, and containing several high summits between the Derwent on the west and the Nive river on the east. In the east of the last-mentioned river that part of the country which lies near the Derwent is extremely uneven and hilly, but farther north the southern plains begin with the tract that surrounds Lake Macquarie, and are about three miles wide, but not three miles in diameter. The shape of this, like all those farther east, shows that they are not enclosed by mountains, but spread out in plains. North of Lake Echard in Great Lake, the source of the Shannon, one of the largest tributaries of the Derwent. It is about fifteen miles long, 10, 1, and, with its numerous branches, 75 miles in circuit; but our maps give it hardly half these dimensions. East of Great Lake are the three Arthur lakes, the largest of which has a circuit of between 20 and 30 miles. Lake Sorell, which is farther to the south-east, is of a very irregular form, and hardly inferior in extent to Great Lake. Smaller lakes are numerous, especially along the west coast which separates the southern plains from the northern plains. There are fewer lakes in the northern plains, and they are all small, with the exception of the Western Lagoon, a cluster of lakes situated at the eastern extremity of that country. Many of these lakes are more five miles long and half a mile wide. The woody tract separating the plains has a hilly surface, and is about eight miles wide where it is crossed by the great road from Hobart Town to Launceston. In the plains there are many short or stunted bushes, and also short bushes having the ground about them very long, and covered with open forests. At other places there are single hills, mostly of a conical form, hence called sugar-loaves: they are most frequent in the district which approaches the Eastern Tier. In other respects of the surface of the plains is either level or slightly undulating. In their natural state they are generally destitute of trees, but in a few spots, especially where the surface is undulating, trees occur in small clumps. The climate is much colder than in the low tracts of the west coast. The Derwent river, flowing for several weeks, and thus the soil imbibes sufficient moisture to maintain a vigorous growth of grass nearly all the year round. The pastures thus produced constitute the great Western Tier, which is the best grazing land in the south: it is the most fertile, and perhaps the best for the growth of grass. The pastures are much better adapted for sheep than for cattle, and the chief part of the wool exported from Tasmania is brought to the seaports from this region. Among these plains that called the may be named the Highlands, and is distinguished from the plains of the north of Norfolk Bay. The highest range of land between the Derwent and Tamar, between the sources of the Macquarie river, which runs to the Tamar, and those of the Jordan, which falls into the Derwent. In this plain there are three ponds, or, rather, hollow depressions, which are filled with water during the rains. Those to the north of the plain where the rains are over, and the soil is then so strongly impregnated with salt that a considerable quantity is collected every season for domestic purposes.

The region hitherto described is watered by many streams, and from the mouth of the Derwent. This river originates, as already observed, in Lake St. Clair. It runs about 80 miles measured in a straight line, until it meets the tide-water, and its general course is south-east. It issues from the lake, it traverses for several miles a plain, and then enters a narrow valley bounded by mountains, in which it is joined from the north by the Nive, and from the south by the Florentine river, the course of which two tributaries is hardly known. It leaves the mountains above its junction with the Nive, and then flows to the sea, forming, of which the uppermost is 30 feet high. It then flows along the foot of the western mountains with a rapid current, and is not navigated, chiefly owing to the numerous rocks along its banks, but also partly because its volume of water is subject to ebb and flow. The rapid occur at New Norfolk, up to which the tide-water comes. During the summer months the water of the river is brackish, and unfit for drinking at New Norfolk; but when it is swollen by rains, it is fresh to the distance of two or three miles below the town. The river here is a quarter of a mile wide, and begins to be navigable for ships. A few miles lower down the river widening to three-quarters of a mile, which width is gradually increased by the number of vessels to the form of a dome. The rocks are above the size of a mountain-torrent; but it receives several rivers from the north which flow from 30 to 35 miles, as the Dye, the Ouse, the Clyde, and the Jordan. Some of them form cataracts and rapids, and none of them are navigable. The river Huon, which drains the greater part of the mountain-region west of the Derwent, has a course of about 80 miles; but this river lies without the settled portion of the country. The country of which this river has only been explored within a few years. No account of it exists. It forms a river, as it were, to the estuary, like the Derwent, which opens in D'Entrecasteaux Bay. Coal River drains the undulating country e-
the Derwent, and falls into Pitt's Water: its course is about 20 miles.

We pass to the description of the northern part of Tas-
mania (north of 41° S.). The waterfalls on the eastern
districts of the country lies to the Pacific, as the
most sources of the South Esk are only from four to five
miles from its shores. The Upper Valley of the South Esk
lies between two large mountain-masses, but the Lower
Valley on the eastern side of the district extends along the
Upper Valley extends from the sources of the river west-
toward to the vicinity of Ben Lomond Rivulet, where an
offset of the Ben Lomond comes close to the river, whilst
frees the south the most north-western branch of the East-
ern District. The mountains are intersected by a nu-
merous valley, and is estimated to rise 4200 feet, or about 1250 feet higher
than the mountain in Scotland whose name has been transferred to it. The
mountain-mass, of which it forms the most elevated portion, extends to a considerable dis-
tance into the tract that Ben Lomond join at a acute angle, leaving between them a
depression of a basin-like shape, which may be called the
Basin of Fingal, from a township of that name situated near the place where the outlet is on the right, or the Break-o'-
River joins.
The existence of this basin has only been ascertained within the last ten years, and our information respecting it is scanty; but as the settlements begin to be numerous, and as it has been divided into hundreds, we may presume that the soil of this tract is good. The
Basin of Fingal extends from north to south about 15 miles, and about as much from east to west. Its southern
districts are drained by the Break-o'-River, which runs in the maritime range, and, running eastward, meets the eastern range, and thereby gives the navigation of the
River to the Ben Lomond range, and waters the northern districts of the basin.
A few miles below the confluence of these two branches, the South Esk, having a south-west course, en-
ters the Tamar valley, which reaches a plain, where is met by the St. Paul's River.
The valley, through which the last-mentioned branch of the South Esk descends from its source in the maritime range, is of a considerable part of its course so wide, that it has obtained the name of St. Paul's Plains, which are described as an undulating country, in some parts over-
grown with open forests, and in others without trees, but
well watered, and producing rich pasture. Between the
Valley of St. Paul's River and the Basin of Fingal is a moun-
tainous district, which is connected on the east with the mar-
time range, and whose western extremity is marked by a
done-like summit, to which the name of St. Paul's Dome
has been given. It is considered to rise 2900 feet above the
sea-level. After the confluence of the two principal branches, the South Esk turns westward, and flows along
the base of the Eastern Tier, so that between the river and
the mountain south of it there is only a narrow strip, with
an undulating or hilly surface, which however has a good soil
and is very productive. The Ben Lomond range, a distance of five or six miles: the
upstream ground resembles in general the St. Paul's Plains, being better adapted for pasture than for agricul-
ture, and partly covered with thin forests. Thus the val-
ley continues to the gorge above the mouth of Ben Lomond Rivulet.

North of the Upper Valley of the South Esk extends the
North-Eastern Mountain Region, the whole of which
is probably occupied by mountains; but the interior of it
has not been explored, and only the outlines of it are
known. The country along the Bay of Fires, between
Cape St. Helen's and Eddystone Point, is of considerable
extent and fertility, but partly wooded and partly covered with
a fine growth of grass. This tract is supposed to be fit for
pastoral settlements. North of Eddystone Point the moun-
tains are several miles from the shore: they have only
been seen from a distance, and appear to constitute one
continuous range, broken in a few places by
which small rivers issue from them. There are no striking
summits, except Mount Cameron, between Eddystone Point and Ringarooma Bay, but its elevation is not known.

The flat country between these mountains and the sea, from the coast to the mouth of the Tamar, is watered by numerous small
streams, but the soil is generally dry and sandy, in some
places overgrown with bushes or short, crooked trees, and in
others covered with swamps, in which small branches are
found. There are a few tracts which have a better soil,
and might be cultivated, as on the banks of Piper's
River. The best portion of this region is the valley of the
Esk, which opens to the west, and stretches east-
ward into the mouth of the Tamar, on the north side of the
range. This valley however is narrow, and contains very
few tracts adapted for agricultural purposes, and the num-
ber of settlements is small, though the proximity of the
sea enables the district to be productive of a large quantity
of timber for their produce. A ridge of sterile but wooded hills runs along the south side of the river, and continues to the banks of the South
Esk, where that river, about a mile above Launceston,
rises in a narrow valley for a mile, and at the point where it leaves that valley it is about 10 miles wide.
The gorge through which the South Esk flows above
Launceston separates the valley of the Tamar, which lies
north of it, from the Basin of Lincoln, which extends south.

The Tamar is only a deep inlet of the sea, which
occupies the site of the city of Launceston, and and the two
miles below Launceston the inlet alternately expands to a
breadth of three miles, and contracts to a mile, so as to appear
like several small lakes connected by short channels. In this
area there are several shallows and sand-banks, and they only dis-
appear about 10 miles from the sea. It is a great obstacle to navigation, and that season of the year when the tide
is running up or down, the vessel is often obliged to
depend upon the tide, and it sometimes happens that a
passage from Port Dalrymple to Launceston occupies two or
three weeks. The mouth of the Tamar is about 27 miles wide, or 3000 yards, the width of the
summits on the two sides of the river, is about eight
miles wide, but two or three of them are occupied by
the dejectives, though these dejectives are rather steep. Thus
the cultivable ground, if the extent of the inlet itself is sub-
tracted, varies between three and six miles. Near the town
of Launceston, and to a distance of about 11 miles north of
it, the country on both sides of the river possesses a con-
siderable degree of fertility, and is well settled; but farther
down the eastern banks have a dry sandy soil, only very
productive and covered with cloaths. On the left bank of the river the soil is much better, and there the
settlements are numerous, though not so numerous as near Laun-
ceston.

The Basin of Lincoln, so called from the hundred of
Lincoln, which occupies the centre of it, is the most fertile
portion of Tasmania. It includes on the east the lower
valley of the South Esk, extending to the western base
of Ben Lomond, and on the west reaches the eastern base of
the Western Tier. It is drained from the Elevated Plains by the hilly and woody tract called Epping
Forest. On the north it is bounded by the ridge of hills south of Launceston, and the mountains which line the
eastern banks of the western river, the so-called
Quamby's Brook. It extends from south-east to north-
est about 25 miles, and as much from north-east to south-
est. This gives an area of 800 square miles. This basin
is watered by several large rivers, which unite, and ulti-
M 2

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mately fall into the South Esk before it enters the above-mentioned gorge. These rivers are, from east to west—Elizabetli River, Macquarie River, Lake River, Peninsula River, and Meander or Western River. The surface and the soil of the Basin are not uniform. East of the South Esk the higher country chiefly consists of plains, either destitute of wood or thinly wooded, and well adapted for sheep: the wide bottom of the rivers yields rich crops. The country between the South Esk and Lake River consists of a strip of land along the coast, the northernmost, which here is low and narrow ridges of hills between them, which however in some places attain a considerable elevation above their bases. These hills are generally wooded, and though the soil on their declivities is good, and they are used for grazing, the wide level tracts along the watercourses have a very fertile soil, most of which is under cultivation. The most level portion of the basin is that which is west of Lake River, for in this district the uplands do not rise much above the bottom of the valleys, extend with an undulating surface, and are seldom interrupted by high hills. Like the bottoms, they were formerly clothed with trees, except on the very margins of the rivers, but nearly the whole of the region has been cleared and laid down to grazing. The soil of the bottoms is very rich, but they are subject to inundations, which however are of short duration. From the Basin of Lincoln all the corn is brought to Lauceston, which is exported from that place, and which is the principal exportation in the country round Sydney, whenever Australia experiences a dearth.

To the west of this basin is the Western Tier, or Western Mountains, which extend from the banks of the Lake River to the westward. The place which bears the name of Arthur’s Lake, in a west-north-west direction to the sources of the river Mersey, a distance of about 50 miles. The range lies between the southern plains and the Basin of Lincoln, but we have very little information respecting the region. A few summits have been noticed, as the Quam-bury Bluff, near the north-western extremity of the Basin of Lincoln, which is stated to be 3000 feet high, and the Extreme Western Bluff, at the west end of the region. It appears that the upper part of the range constitutes a tolerable level, on which only a few peaks attain 500 feet, and which is covered with small lakes, grass, and an alpine vegetation. Some low rocky ridges which run across it are covered with crooked eucalyptus and bushes. The width of this elevated tract does not exceed a few miles, but its elevation must be considerable, which may be inferred from the circumstance that even in January, which corresponds to our July, a heavy fall of snow was experienced on the ground which reaches deep. On this whole vegetation, especially the frequent occurrence of lichens and mosses, proves its great elevation, which probably is not much less than 4000 feet above the sea-level.

At its northern extremity the Western Tier is of considerable height. The river Emu, rising on the northern part of the Loddon Bluff, a distance of about 25 miles. At its northern declivity extends a depression or valley, from east to west, which may be called the Valley of the Meander, as that river drains the greater part of it. Though a cart-road has been made through it, we are not acquainted with its extent from south to north, but we are informed that it extends westward to the vicinity of the Mersey where this river turns westward, being here divided from the main range by a narrow neck of the Western Tier. This tract consists of level plains, which are generally without trees, but in several places there are small clumps of them, and they are occasionally intersected by narrow belts of forest, extending from the mountains to the banks of the rivers. Numerous rivers water this country, the soil of which is stated to be of good quality, and equally adapted to cultivation and the rearing of cattle.

The northernmost part of the plains, which extend westward from the banks of the Mersey, two high and steep mountain-ridges must be passed before that region is reached which is called the Surrey Hills, and which constitutes one of the most remarkable features of Tasmania. It occupies the country for about 20 miles on each side, and extends from St. Vild’s Point, at the south, to 40° S. lat. and from 41° 30′ S. lat., but properly speaking, its extent towards the south is not known, and it is even probable that it reaches the foot of the Elidon range, a chain of mountains which has been seen from a distance, and which probably is about 41° 55′ S. lat. This region gives origin to a great number of rivers, which run off in all directions. With the exception of a few rivulets originating near the coast, all the rivers which fall into the sea westward of 40° S. lat. in the Surrey Hills must therefore constitute the highest ground in the part of Tasmania. It is remarkable that the highest part of the region lies on its outer edges, for the region is surrounded on the east, and still more so on the west, by the most elevated parts of the country. These hills are likewise the most elevated parts of the country. These hills are likewise, but are otherwise covered with dense forests frequently matted together by underwood. Among the same circumstances, the plains project from the higher edge, which is 3000 feet above the sea, and the Black Bluff Mount, which is said to be 300 feet higher. The interior of the region is very different. Its surface is formed by a succession of low hills, which rise with so gentle a slope that it may be considered a plain, and it is intersected by small brooks, the sides of which are adorned with narrow belts of beautiful shrubs and trees. Whenever a hill rises to a higher elevation, its declivity consists of level and terraces, and it is surrounded by stunted and alpine pepper-trees. There are many open plains of several square miles in extent without a tree. In general there are not more than ten trees to an acre. The hills are covered with a vigorous growth of grass and ferns, and the surface is of a very light brown loam. The substratum appears to be gravel, which renders these hills perfectly dry, and fit for sheep—walks, for which purpose they now are used by the settlements which have been formed on them by the Van Diemen Company. The river issues from the hills of St. Valentine’s Peak on both sides of the Emu river, where it appears even more park-like than farther south, being handsomely clumped with trees. This tract is called the Hampstead Park. The elevation of the higher part of the plains renders the climate much colder than on the coast. Snow covers the ground for several weeks, which however must be considered as an advantage in a country where the soil inclines to dryness. It has also the benefit of abundant rains during autumn (March and April), which furnish a rich supply of water.

Between the valley of the Meander and the Surrey Hill’s on the south, and Ban’s Strait on the north, is the hills region of Devonshire. The mountains which extend from the gorge of the South Esk to the west of the Tasman north-west, and terminate on the sea, are with the mountains, appear to constitute a continuous range of moderate elevation. They are largely wooded and partly destitute of trees, and in some places covered with a very scanty vegetation of grass and bushes. Further west the range is less known, except that the spaces between the rivers are filled up with mountains and high hills, and that these heights come close to the shores of the sea. Few, if any, settlements have been formed on it. This region extends westward from the Loddon Bluff to Emu River.

West of the Emu River begins the Great Plain of Tasmania: it occupies the north-western portion of the island, extending along the northern coast from the Emu to Cape Grim, and along the western coast to the Arthur River. The narrowest portion of this plain appears to be between the Emu and Detention Rivers, where its width does not exceed 12 miles, and it terminates on the south at the Hampshire Hills. Farther west a continuous range of hills and mountains, with few valleys, occupies the country, and terminates near the source of the Detention River, with Dip Hill, a mountain of moderate elevation. The surface of this portion of the plain is strongly undulating, and is in many parts even hilly. Near the shores it is overgrown with dense forests, which are peculiarly susceptible below the underwood, bushes, and ferns. But about three miles or somewhat more from the sea the forests are interrupted by a succession of small plains covered with grass and destitute of trees. They have a light dry soil, are well watered by many small and intersecting streams, and support grass. The grass is coarse but plentiful: there are also some tracts fit for cultivation. West of Detention River the plain grows wider. From Dip Hill, at the source of the Emu, the highest part of which is very impressive from Cape Grim and West Point, though they are of very moderate elevation. The plain, west of Detention River, exceeds 15 miles in width. This large tract however is very ill adapted for colonization. The surface is generally level
and the water not being carried off, the country has been converted into an immense swamp. A portion of the swamp is overgrown by low tea-trees, and the remainder is covered with forests of eucalyptus and underwood. The higher grounds, which generally occur nearer the shores, have a sandy soil covered with heath or scrub. The only tract which seems useful to the purposes of agriculture is the land along the sea from Cape Grim to the River Arthur: its width near the cape is several miles, but farther south it grows much narrower: the surface is hilly and partly stony. The soil of the higher grounds is turned to a thin layer of earth, thickly covered with kangaroo grass, and makes good pasture-ground for sheep, and in some places for cattle. Trees occur only at considerable distances from each other. It is probable that the plain continues south of the River Arthur, but that it is of less extent than those that have been seen at a short distance from the sea, which are dry and only covered with bushes, but behind them the hills rise much higher. These parts have never been visited.

The Arthur, whose mouth is near 41° 10', lat., is a river of considerable size, and brings down a large volume of water. There is a bar across its mouth, on which the sea breaks with a heavy surf. Its middle course is not known, but it is supposed that the chief supply of its waters is derived from the slopes of the high hills to which it seems to be connected. The upper reaches of these rivers interlock with rivers which flow southward to the Derwent. As other branches of the South Esk rise near the eastern coast, and others far to the west, it is probable that the area of the country supplied by these rivers, and perhaps that of the North Esk, is as great as that of a country of about 4000 square miles.

The Tamar certainly receives the drainage of a much larger extent of country than any other river of Tasmania.

Climate.—As no meteorological observations have been published on the climate of Tasmania, we only know its peculiarities by circumstantial accounts which have been made between it and that of England and Sydney. There is a considerable difference between the climate of Hobart Town on the southern, and of Launceston on the northern coast. The climate of Hobart Town seems to be much more influenced by the range of mountains west of the town and the vicinity of the open ocean. The vague statement of Breton, that the mean temperature in summer is 70°, and in winter between 40° and 48°, is apparently derived from observations which have not been much relied on. The climate of Hobart Town is extremely changeable. Heat, cold, rain, and sunshine succeed each other with a rapidity which is rarely observed in any other part of the globe. The winter is not moderate, so that the summer; the same alternations, with the addition of hail and snow, follow each other in quick succession; but the snow never remains on the ground beyond a few hours, whilst at Launceston it falls in greater quantity, and covers the ground for many days together. This statement does not agree with another, according to which the average number of days on which rain actually falls does not exceed fifty or sixty in the year, and that, except on these days, the sky is clear, the sun brilliant, and the atmosphere dry, pure, and else where there is neither wind nor cloud. It is sometimes necessary to raise the thermometer to 106°. They blow from north and north-west, and rarely last a long time; but during their prevalence vegetation is greatly injured. However warm the middle of the day may be, it is invariably attended by a morrow and evening, so cold that the thermometer may be taken to 106°.

The spermaceti-whale is very abundant in Bass's Strait, and many of them are annually taken, but more by the inhabitants of Australia than by those of Tasmania. Black whales abound in all the seas round the island, and a very lucrative fishery is carried on along the eastern coast. Southern right whales, sperm, and blue whales are also exported. All these whales have been introduced by the settlers. The domestic animals of Europe have been transplanted to Tasmania, and thrive very well. Sheep are most numerous. Wool and live stock is exported to a great extent. Black cattle are also numerous, and many sheep are annually exported; and also some horses. Fowls are extremely numerous, but geese and ducks are not much kept.

The sparrow-whale is very abundant in Bass's Strait, and many of them are annually taken, but more by the inhabitants of Australia than by those of Tasmania. Black whales abound in all the seas round the island, and a very lucrative fishery is carried on along the eastern coast. Southern right whales, sperm, and blue whales are also exported. All these whales have been introduced by the settlers. The domestic animals of Europe have been transplanted to Tasmania, and thrive very well. Sheep are most numerous. Wool and live stock is exported to a great extent. Black cattle are also numerous, and many sheep are annually exported; and also some horses. Fowls are extremely numerous, but geese and ducks are not much kept.

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From one of its species a mannisa is obtained, which tastes like some kind of sugar-plum: it forms conditions on account of its small size; and the black pine, found in such trifling quantities, that it would never repay the trouble of collecting it. The most useful tree is the stringy bark, which is used for building and fencing; and the blue gum, of which most of the boats in the colony are built, is used for masts for small vessels. The peppermint, so called from the taste of the leaves, is a large tree, but of very little use. The Huon pine is the most beautiful wood in the island; it is very superior both in colour and quality; but scarce and difficult to be had. The Adventure pine, so called from the bark of that name, is a species of pine adapted for house-work and furniture; but it is not common. The black and silver wattle (mimosa) are used in house-work and furniture, but they are of diminutive size.

The bark of the black wattle is exported to England in large quantities. The tea-tree is a shrub which grows in wet situations: an infusion of its leaves makes a pleasant beverage, and, with a little sugar, forms an excellent substitute for tea.

(Findlay's Voyage to Terra Australis; Rossell's Voyage d'Entrecasteaux, &c.; Evans's Geographical, Historical, and Topographical Description of Van Diemen's Land; Watson's Statistical State of Agriculture, &c., in Van Diemen's Land; Bishop's Sketch of the History of Van Diemen's Land, &c.; and Breton's Excursions in New South Wales, &c.)

History.—In 1803 Lieutenant Bowen, commissioned by the government of New South Wales, landed on the east bank of the Derwent, and formally took possession of Van Diemen's Land as a place of settlement. In the following year Colonel Collins, the first lieutenant-governor, arrived, and established the seat of government on the west bank of the Derwent; he gave to the spot the name of Hobart Town, in compliment to Lord Hobart, then secretary of state for the colonies. Colonel Patterson arrived in the same year in the Tasman, and formed an establishment on its west bank. Colonel D'Urville, who succeeded to the government in 1813, and under his administration the ports of the colony were first opened to commerce, only transport vessels from New South Wales having previously been admitted. Colonel Sherley was appointed lieutenant-governor in 1817, and in 1818 the immigration of free settlers from England commenced, the colony having been previously exclusively formed of criminals sent from New South Wales for crimes repeated there, and of the civil and military officers charged with their superintendence. Towards the year 1824 the government was subject to that of New South Wales, and the chief civil and criminal questions arising in Van Diemen's Land were decided in Sydney. The only courts in the island were those of police magistrates, with limited cognizance of petty crimes, and a summary court for the settlement of questions of value not exceeding 50L. in which a military officer presided. Great inconvenience and mischief resulted from this state of things. Civil cases were mostly settled by compromise; and in criminal cases, the most dangerous offenders were allowed to escape.

The most important steps in the progress of the colony were made between the years 1824 and 1836, during the administration of Colonel Arthur:

In 1824, the population was 12,493; in 1836 it was 40,283.

- Number of Acres and Acres: 130,000;
- Pounds of wool: 1,942,900;
- Number of manufacturers: 22;
- Banks: 2;
- Revenue: £16,898, £106,679;
- Expenditure: £32,120, £103,029;
- Value of Imports: £62,000, £283,616;
- Exports: £14,500, £230,079.

(The Statistical Returns of Van Diemen's Land, compiled by the Colonial Secretary, Hobart Town, dated 10th Oct, 1836.)

Roads were formed and bridges constructed in different parts of the island; wholesome laws were introduced; the tone of public opinion was improved, and the fruits of enterprise and industry were secured by an improved police system.

That which chiefly contributed to the progress of the settlement was extraordinary encouragements held out to emigrants. Grants of land were made to them proportioned in amount to the capital which the colonist was prepared to invest in stock and in agricultural improvements. The labour of convicts was not only liberally provided, but the colonist was rewarded for employing it by allowances of rations for himself and the convicts in his employ for some time, and in a remittance of 22s., or its equivalent, for this remuneration, or, to speak more correctly, this additional bonus, was withdrawn altogether, labour was obtained on the easy conditions of the settler providing clothes, food, and lodging to the convicts assigned to him, whereby there were additional inducements to his application to the various purposes for which the colony was founded, which assisted its progress. The character and condition of the majority of the population required that a civil and military force should be established on the island, which, being maintained by the British government, introduced so much capital annually. From the magnitude of their crimes or their dangerous character, it was not deemed safe to remove from under the immediate coercion of government those who had large and extensive effects upon the industry of the convicts, and their punishment was made to consist of hard labour at works of public utility, such as the making and repairing of roads and bridges. While the expense of maintaining these convicts was defrayed by the British government, the settlers had to pay for the payment of that labour. With such circumstances in its favour, with a healthy climate, and a soil of average capabilities, it was impossible that Tasmania should not advance. Its progress has accordingly been steady, scarcely interrupted, and its resources have hitherto been so far exposed — to none indeed but such as may be strictly referred to that gambling spirit of speculation which the occasional great profits of an imperfectly established market are apt to engender.

In 1831 the system of colonization by free grants of land was abolished, and since then land has been sold by auction, first at the upset price of five shillings per acre; subsequently at twelve shillings per acre; and latterly at twenty, at which price it is ranged. The system of assignment of convict labour is at present only partially continued, and the good will, the steady subordination of the servants are requisite to the success of industrial operations.

Trade and Commerce.—The staple article of production in Tasmania is wool, the amount of which exported in the year ending December, 1838, exceeded 2,480,000 lbs. (Parliamentary Report on Wool and Woollen Manufactures, April 29, 1838.) The value of this wool in the English market has, according to the Statistical Report of the secretary of the government of Van Diemen's Land, quoted above, ranged from 14d. to 22s. per lb. A considerable trade has during the last five years been carried on with the new colonies of Australia, South Australia, and Port Phillip, in sheep, the prices of which have varied in the same time so much as from seven shillings to sixty shillings per head.

Owing to the smallness of the demand for grain, and the great outlay required in the clearing of land, agricultural operations have been slow in Tasmania. This has likewise been attributed by the circumstances of the earlier settlers being chiefly artisans of intertemperate habits, unacquainted with husbandry, and disinclined to attain a knowledge of it. The writer from whose account we quote, himself for ten years a convicts' remarkable colonist of Van Diemen's Land, obtained and located themselves on grants of land; turned up the soil, and threw grain into it; and it being grateful, repaid their rude essays with bountiful harvests. This was sufficient. When one piece of land was exhausted, another was broken up, and so on in constant succession. Fresh
settlers continued to arrive, and obtained land too; and as these were not agriculturists either, they had to copy their predecessors. Such was the progress of agriculture in Van Diemen's Land; and such is its condition at the present period (1838). The diversity of the climate in the different districts of the town, however, the season, and the proper times for reaping and sowing, remain constant, and the proper times for sowing remain doubtful, and are adopted irregularly. (The Condition and Capabilities of Van Diemen's Land, by John Dixon, 1839.) Van Diemen's Land however produces not only a sufficient supply of flour, potatoes, and meat, but also all seasons of the year. Sperm oil, as well as that of the black whale, is exported. The returns derived from this source are still considerable.

Among the miscellaneous exports are bark, kangaroo skins, and potatoes (to Sydney); but the aggregate of the returns from these articles is trifling.

There are about eight banking establishments, with branches in the chief towns. They are all joint-stock, the shares are freely transferable, and the funds of the town are lent at interest. They circulate notes of one pound and upwards. Bank interest at a recent date was ten per cent., and at the period at which this article was written it cannot be affirmed with confidence whether it is lowered. There are also several newspapers published in the colony, and the following details we adhere to the divisions into districts. The district of Hobart Town is bounded on the east by the river Derwent, and on the south and west by the river Huon, on the north by New Norfolk and Richmond districts. This contains an area of about 1000 square miles, or 250,000 acres, of which not more than about 4000 are yet in cultivation. Richmond is bounded on the south and east by the sea, on the north by Oatlands, and on the west by New Norfolk and Richmond districts. Besides it contains several large agricultural establishments: it contains about 1050 square miles, or 672,000 acres, of which about 225,000 are estimated to be under cultivation. New Norfolk is bounded on three sides by Hobart, Oystercove, and Richmond districts, and on the west and south-west by unlocated lands. The towns are New Norfolk and Hamilton, and it comprises about 1600 square miles, or 66,000 acres, a great portion of which is barren and rocky: about 1000 acres are in cultivation. Clydesdale is bounded on the west by unlocated lands, and on the other three sides by New Norfolk Plains, Campbell Town, and Oatlands districts: its only town is Bothwell. This district comprises 1700 square miles, or 1,082,000 acres, about 6000 of which are in cultivation. Oyster Bay, west by the Clyde district, and north by Campbell Town, contains 900 square miles, or about 570,000 acres. Oatlands and Jericho are its towns.

Towards of 4000 acres are in cultivation. Campbell Town, which is the seat of the Government, is about 2000 square miles, or more than 1,000,000 acres. Longford and Westbury are the townships. About 8000 acres of land are supposed to be in cultivation.
so low as to exhibit the amount of the Hobart Town imports and exports, with the places from which received, and to which sent, for the year ending December, 1837:—

**Imports.**

<table>
<thead>
<tr>
<th>Country</th>
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<tbody>
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<td>Great Britain</td>
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<tr>
<td>New South Wales</td>
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<td>8,147</td>
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<tr>
<td>Calcutta</td>
<td>4,397</td>
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<tr>
<td>Mussulos</td>
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<td>Manilla</td>
<td>380</td>
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<td>Singapore</td>
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<td>Cape of Good Hope</td>
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<td>Hamburg</td>
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**Exports.**

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<td>Canton</td>
<td>15</td>
</tr>
<tr>
<td>Valparaiso</td>
<td>60</td>
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*£348,120*

In a comparison of these returns it is pointed out by the editor of the 'Van Diemen's Land Annual,' from which publication they are taken, that the apparent balance exhibited against Hobart Town is diminished when it is considered that a great portion of this balance consists of property imported by individuals who have settled in the colony. We have not been able to procure authentic returns of a later date than those quoted; but it may be concluded, from the value both of the exports and imports of Hobart Town has greatly increased since.

Launceston, the second town of the colony, is situated at the confluence of the North and South Esk, which there form the Tamar, flowing about forty-five miles, when it disembogues into the ocean at Bass's Straits. It is 124 miles from the capital of the colony. Launceston is situated in a marshy spot, and is neither in beauty nor in the promise of health to be compared to Hobart Town. The enterprise of its inhabitants, aided by the vicinity of the richest settlements in the island, is, however, great, and it is not improbable that this town will outstrip its southern competitor in commerce. The imports in the year 1837 were £181,943 in value; the exports being £284,561, upwards of twenty-nine thousand pounds above those of Hobart Town; and in subsequent years it is believed that the difference is much greater in amount. Launceston contains many churches, the property of different religious denominations, and the private and public buildings are not destitute of architectural beauty.

The highway between the northern and southern capitals of Van Diemen's Island is for the most part well laid out; there are inns along this road at short distances from one another, the accommodation in which is not far from equalling in comfort the same on the roads of England. Passing from the highways into what were not long since unpeopled woods, the fashionable vehicle as well as the rustic waggon of the settler is to be seen driven along cross roads which are every day increasing in number; and here and there only partially obscured from a distance by the thick and sombre Australian foliage, are to be seen mansions almost baronial, superseding the rude shelter of the aborigine, and the hut, almost as rude, in which the colonist first lodged.

Launceston was in 1838 a census of the free inhabitants of Van Diemen's Land was made with a reference to the religious denominations to which they belonged, which exhibited the following summary:—

<table>
<thead>
<tr>
<th>Religious Denomination</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Church of England</td>
<td>16,094</td>
</tr>
<tr>
<td>Church of Scotland</td>
<td>2,251</td>
</tr>
<tr>
<td>Church of Rome</td>
<td>2,298</td>
</tr>
<tr>
<td>Wesleyans</td>
<td>1,289</td>
</tr>
<tr>
<td>Baptists</td>
<td>175</td>
</tr>
<tr>
<td>Independents</td>
<td>605</td>
</tr>
<tr>
<td>Quakers</td>
<td>90</td>
</tr>
<tr>
<td>Jews</td>
<td>132</td>
</tr>
</tbody>
</table>

**23,244**

The accuracy of this return, in so far as it referred to the relative numbers belonging to different religious denominations, was generally questioned; but the aggregate representation of the amount of population, we believe, was admitted. No great increase by immigration has taken place since, and the new colony of Port Phillip has attracted many from Tasmania. The return of the number of male and female convicts for the same year gives:—

*Male convicts* 16,129
*Female convicts* 2,139

An account of the convicts system of Van Diemen's Land is reserved for the article on Transportation; but the following returns are introduced here, as they bear upon the general social condition of the island:—

**Return showing the Disposal of the Convicts in 1838.**

<table>
<thead>
<tr>
<th>Type of Disposal</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sent to Tasmania</td>
<td>114,243</td>
</tr>
<tr>
<td>Sent to New South Wales</td>
<td>23</td>
</tr>
<tr>
<td>Sent to Port Arthur</td>
<td>23</td>
</tr>
<tr>
<td>Absconded in 1837</td>
<td>225</td>
</tr>
<tr>
<td>Died</td>
<td>167</td>
</tr>
<tr>
<td>Executed</td>
<td>532</td>
</tr>
<tr>
<td>Confined in gaols</td>
<td>69</td>
</tr>
<tr>
<td>Sick in hospitals</td>
<td>82</td>
</tr>
<tr>
<td>Invalid establishments</td>
<td>126</td>
</tr>
<tr>
<td>Employed in chain gangs</td>
<td>537</td>
</tr>
<tr>
<td>Employed in public works</td>
<td>2,663</td>
</tr>
<tr>
<td>Artificers on loan to settlers</td>
<td>262</td>
</tr>
<tr>
<td>Assigned to settlers</td>
<td>6,023</td>
</tr>
<tr>
<td>Tickets of leave <em>or</em> conditionally free</td>
<td>3,900</td>
</tr>
<tr>
<td>Convicted and held for punishment</td>
<td>32</td>
</tr>
<tr>
<td>Total number remaining</td>
<td>2,086</td>
</tr>
</tbody>
</table>

*16,059*

**Female Convicts.**

<table>
<thead>
<tr>
<th>Type of Disposal</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sent to Tasmania</td>
<td>163</td>
</tr>
<tr>
<td>Conditional pardons</td>
<td>62</td>
</tr>
<tr>
<td>Died</td>
<td>16</td>
</tr>
<tr>
<td>Sent to New South Wales</td>
<td>1</td>
</tr>
<tr>
<td>Total number remaining</td>
<td>2,086</td>
</tr>
</tbody>
</table>

*2,318*

**State of Crime.**—If Van Diemen's Land has greatly benefited in an economical sense by being a settlement for convicts, it has undoubtedly suffered from this cause in a moral sense. A paragraph will not suffice to give an accurate idea of the general moral condition of the population. Referring therefore to the Transportation Report of 1838, and to a volume entitled 'Australasia,' by Captain Macrae (R.N., K.H.), published in 1838, we shall introduce here only a few details and accompanying explanations taken from the last of these authorities. Notwithstanding the strictness and vigilance of the police of this colony, notwithstanding the length of time during which the convicts have for the most part been subjected to its minute supervision, notwithstanding the decided tendency of the age to moral improvement, and notwithstanding the great influx of free settlers into the colony within the last ten years and the high personal responsibility of most of them, the proportion of crime and disorder to the entire population is not only very great, but appears in many particulars even to be on the increase. From No. 33 of the Statistical Papers drawn up by the colonial office, we have the following returns, for the whole period:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1824</td>
<td>3,044</td>
<td>380</td>
<td>3,424</td>
</tr>
<tr>
<td>1825</td>
<td>2,980</td>
<td>380</td>
<td>3,360</td>
</tr>
<tr>
<td>1826</td>
<td>2,756</td>
<td>390</td>
<td>3,146</td>
</tr>
<tr>
<td>1827</td>
<td>2,444</td>
<td>400</td>
<td>2,844</td>
</tr>
<tr>
<td>1828</td>
<td>2,200</td>
<td>410</td>
<td>2,610</td>
</tr>
<tr>
<td>1829</td>
<td>2,000</td>
<td>420</td>
<td>2,420</td>
</tr>
<tr>
<td>1830</td>
<td>1,800</td>
<td>430</td>
<td>2,230</td>
</tr>
<tr>
<td>1831</td>
<td>1,600</td>
<td>440</td>
<td>2,040</td>
</tr>
<tr>
<td>1832</td>
<td>1,400</td>
<td>450</td>
<td>1,850</td>
</tr>
<tr>
<td>1833</td>
<td>1,200</td>
<td>460</td>
<td>1,660</td>
</tr>
<tr>
<td>1834</td>
<td>1,000</td>
<td>470</td>
<td>1,470</td>
</tr>
<tr>
<td>1835</td>
<td>800</td>
<td>480</td>
<td>1,280</td>
</tr>
<tr>
<td>1836</td>
<td>600</td>
<td>490</td>
<td>1,090</td>
</tr>
<tr>
<td>1837</td>
<td>400</td>
<td>500</td>
<td>900</td>
</tr>
<tr>
<td>1838</td>
<td>200</td>
<td>510</td>
<td>710</td>
</tr>
</tbody>
</table>

The tendency, as is well known, in English society, varies in peculiar circumstances, has been rather steadily, during the last ten or twelve years, towards sobriety. Felonies disposed of summarily were in like manner, in 1833-34-35, as 4,489, 4,426, and 4,462, in 1836-37-38, as 3,787, 3,740, and 3,730; among the people, as 7,815, 7,870, and 7,895; and what are called various offences, not included under previous heads, as 1,712, 1,745, and 1,857.**

*We have not introduced the returns of convicts arriving from England, which explain the difference between these totals and those previously quoted.*

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*Note: The text contains a table of the state of crime for various years, showing the number of convictions by sex and year.*
MacNockie quotes returns of the convictions before the supreme court and quarter-sessions, on which he remarks: 1st, that the ratios throughout the whole population are limited to the convictions in England being scarcely 1 to 1000 inhabitants, and in Scotland only 1 to 1300; 2nd, the extreme vigilance of Van Diemen's Land police tends to be pointed for the solemnity of its courts. The latitude given to its summary jurisdiction makes it unnecessary to bring medium offences under the cognizance of the higher courts; 3rd, the pecuniary prosperity of Van Diemen's Land is advancing, which shows that distresses of the colony, residing with the state of petty crime in the colony to that in London, it is found that in Van Diemen's Land, for drunkenness alone, the convictions among the free population are about 4 per cent.; whereas in London, for every description of petty offence, they are little more than 5 per cent.; and Captain MacNockie remarks that the returns in Van Diemen's Land refer to a mixed population of agriculturalists as well as town residents, which makes the comparison still more disadvantageous. As general characteristics, he mentions disension, bitterness of feeling, improvidence, and a reliance upon authority, instead of moral influence, in the relations of master and servant. He remarks also that there is a low standard of moral practice among the natives; that the indigenous is radically more detrimental than great occasional vices, and one which is more difficult to correct. But as he frequently points out in his interesting work, and as there is a deficiency of remarking here, in strictness a social principle, can consist vested in the population of Van Diemen's Land; the colony is not old enough to have moulded the character of its inhabitants; and, amid much that is painful in the aspect of society, there lasts an extraordinary character—individual benevolence and public spirit.

Government.—Van Diemen's Land is administered by a lieutenant-governor, who is assisted by two councils. The lieutenant-governor has the initiative of all laws. The councils are the Executive and the Legislative. The former is composed of official members, and the latter of official and non-official: all are appointed by the crown, and removable at the governor's pleasure, with the sanction of the crown. If two-thirds of the legislative council are opposed to any act proposed, it cannot be passed, and the reasons of dissent are entered. Practically however this provision is of no value, for half of the council are salaried officers of the local government. Laws passed by the councils are not in force until confirmed by the Governor in Council; and fourteen days from such enrolment, unless the judges declare them to be repugnant to British law or the charter, or letters patent of the colony, they come into operation. In case of objection being made, the judges have a jury—a court to try it. This court declares insolvencies and distributes effects: it likewise possesses equitable and ecclesiastical jurisdiction. The total estimated expenses of the judicial establishment for the year 1839 was £34,556.

In all the most populous districts of the island there are police magistrates, who sit daily for the trial of petty offenses: their decisions are subject to the approval of the governor, who is advised by the chief police magistrate. A detail of papers has been left without no doubt of the exactness of convicts. The total police estimates of Van Diemen's Land for 1839 exceeded 26,000.

The ecclesiastical provision is of the most liberal character.

Three religious denominations, the Episcopalians, Presbyterians, and Roman Catholic, receive allowances from the state. They are equally provided for in proportion to the respective number of their bodies, and the clergy of each have the same political status. In the colonization the subscription was made up of one hundred and twenty persons or under a specified age being considered equal to one adult) to a paper, intimating their connection with one of the denominations named, desiring to have a church erected. After deducting the contribution of at least 300£, towards its erection, and the conditions on which the government erects such church and provides for the maintenance of worship in it. In the rural districts the fulfilment of these conditions by eighty per cent. within a radius of ten miles, is required. The sum expended by the government on the erection of a church is equal to that raised by private contribution. The stipend allowed to the clergy in the town is 250£ annually, and to those in the rural districts 200£. A glebe and ten acres of land are also annexed, with a further sum of money for the feed of a horse. The Wesleyans have an annual grant of 400£ voted in their favour by the legislative council.

The Church Act has stimulated the erection of churches in the colony, so that there is now no deficiency, comparatively speaking, except in the districts in which there is a very limited population. The estimated expenses of the ecclesiastical establishment for the year 1839 amounted to 9,181£. On the 1st of July, 1839, the number of pages at which that estimate was made, exerted so much influence that it has since done, and at present it is certain that the ecclesiastical outlay is considerably above the sum stated. Numerous churches have been erected throughout the settled districts of the island by the Wesleyans' denominations, not embraced in the government scheme of support. The government assists in the maintenance of Sabbath schools in connection with the different churches. The liberal provision is made for education, on the principles chiefly of the British and Foreign School Society; and, besides a collegiate institution, founded and maintained by the government, one has been projected by the colonists, for which subscriptions have been raised. The site of the first is at New Norfolk; the second is to be established at Campbell Town. These institutions are to be in the first instance superior grammar-schools; and gradually, as professors can be obtained, and there is a demand for the higher branches of learning, they are to receive the character of colleges.

In the estimates of the expenditure of Van Diemen's Land for the year 1839, a sum of 4000£ is put down for schools; and an additional sum of 2751£ for the 'Orphan Funds,' which is to consist of contributions from schools, in which the offspring of convicts are educated and maintained. The expense of the collegiate institution is not included in the sum of 4000£: its foundation had not been laid at the date of that estimate.

The revenue of the colony is derived from duties on spirits—10£ per gallon; on tobacco—7s. 6d. per hogshead; in geneva, West India Rum, or British gin; 1s. 6d. per pound on tobacco; from licences—25£ per annum for licence to sell spirits; 3£ 3s. 4d. for auctioneer's, and 4s. 4d. for marriage licences; from the fees of public offices, fines, &c. It has increased progressively for many years. In 1826 it amounted to 34,655£ 0s. 1£d.; in 1830 it was 62,018£ 7s. 8d.; in 1835 it was 91,320£ 19s. 9d. (Statistical Report of the Colonial Secretary). With the addition of the revenue derived from the sale of land in these years, it amounted to 65,178£ 17s. 9d. in 1830; to 106,640£ 8s. 2d. in 1835; in 1840, the revenue, it was estimated, would amount to 200,000£. Part of this revenue is appropriated to foundations, and rests to the civil, judicial, ecclesiastical, and miscellaneous expenses of the colony, which are not borne by the British government. The expenditure of the year 1837 amounted to 136,886£ 1s. 6d.; for 1838 the estimated was 124,438£ (see Parliamentary Abstract, dated July 9th, 1838, Colonial Secretary's Office, Hobart Town.)

Natives.—The aborigines of Van Diemen's Land are so closely resembled in physical character with those of Australia. M. Péron says that the Tasmanian has a large head, especially remarkable for the great length of the line from the chin to the scalp, and that the head of the New Holland is less astylar, and composed in this back part, while that of the Tasmanian is elongated in Vol. XXIV.—N
the same direction. The great difference consists in the hair, which is straight or curled in the New Holland, and woolly in the Tasmanian. (Papers on New South Wales, by Baron von Haid, Esq.) In languages and customs the resemblance is equally apparent. Tasman, in the brief account of his voyage, published in 'Harris's Collection of Voyages' (vol. i., p. 325), mentions his observing on the shores of Van Diemen's Land trees which had 'a kind of smooth bark, in order from the root up to the boughs and limbs of the same.' These statements, however, are not used by Dr. Johnson, who dared to do this possessed the qualities essential for the successful treatment of an uncivilized race with a view to its improvement. However that cause was rewarded by the appointment of Mr. Robinson to the office of 'Missionary to the Tasmanians at Flinders's Island.' It would be tedious to detail the features of the 'civilising' process pursued there: it is sufficient to mention that every habit and amusement peculiar to the aborigines has been destroyed, and their time and accidents of advanced civilization have been imitated, day-by-day; the native language has been as much a possible suppressed; native names have been made to yield to those of the Caesars, the Hannibals, and the Scipios, and in a disposition to indulge in travel, the Romance has been recorded as a delinquency; and the temporary Expenditure of the Commandant and the Catechism alleged as the evidence of religious progress, and a foundation of all belief as to the capacity of uncivilised race to appreciate the doctrines of Christianity. (Report of the Commandant of Flinders's Island; Parliamentary Paper, 1839.)

An intelligent witness of the experiment carried out at Flinders's Island has thus reported upon it: 'The commandant is an established Englishman, who haven't the aborigines, and supply the deficiencies of their own labour, and is rewarded by a great deal of reading, writing, singing, résevoir, the cealia, tailoring, and minor accomplishments and written words, a word, which gratifies superficial examination; and persuades himself that he is eminently successful with them; but they have no free agency, and are mere children at school, and they cannot escape from their prison, cannot resist its influences. In a word, its rules, it must be a place of exercise, emuin to the moral agents they are lower now than when savage; yet, in the same fater, we, for much of this kindness. The commandant imputes the mortality among them the situation of the aborigines, but he of little, the south coast of New Holland; but in six months I persuaded they would be, on this plan, happy savages in the bush. (MS. Letter.)

TASSEL, JAMES, was born of humble parentage about the year 1735, in the neighbourhood of Glasgow, and was brought up as a country stone-mason. Going to Glasgow on a fair-day to enjoy himself with his compatriots, he visited the collection of paintings exhibited by a certain Mr. von Wenceslaus (now Sir Anthony). He attended an academy for the fine arts in that city. (Forum, vol. i., p. 383.) Feeling a strong desire to become a painter, Tassel removed to Glasgow, and studied drawing in an academy, but continued to practice his business. The progress of his studies was greatly accelerated by the influence of his patrons, and he soon began and hoping at least to become a stodgy, if not a painter, in 1736, went to Dublin, where he was employed at some time as a sculptor and modeller. There he became acquainted with Dr. Quin, who was making experiments in the beautiful art of imitating engraved gems by means of colored glass, and pastes, and who engaged him as his confidential assistant. Having succeeded in the greatest improvements in the art by their joint labour, Tassel was sent to London, and to follow it as a profession. He accordingly reached London in 1776; and although, owing to his deficiency and modesty, he had to struggle with many difficulties, he gradually emerged from obscurity, obtaining commissions for portraits, and the like, the prevailing notion being that the principal cabinets of Europe were thrown open to him. Among his earliest patrons in the metropolis was the Society of Arts, who, in 1767, awarded him the first medal for portraits of ancient origin. In 1766 he was commissioned by the late Prince of Hamilton, then residing in Compton Street, to execute a catalogue of the ancient and modern gems in his collection of which he sold pastes or sulphur impressions at very moderate prices. The collection then amounted to some thousands of pieces, and it was much extended, and in 1791 appeared a new catalogue containing fifteen thousand eight hundred articles forming two quarto volumes. This work, which was not confined to a dry description of the gems, but contained...
much useful information on that department of ancient art was compiled by Mr. R. E. Raspe, who prefixed to the catalogue an introduction on the utility of such a collection of works of art, and on the history of engraving upon hard stones, and the imitation of gems by artificial pastes. The work contains also a frontispiece and fifty-seven plates of engravings, which, as it is well known, have been frequently re-engraved. It is certain that the demand for Tassie's pastes was encouraged, in the first instance, by the jewellers, who introduced them into fashion by setting them in rings, and it is evident that the taste for them is good, and that the description and comparisons, but he indulges at times in some sentimental extravagances. After writing his poem, he detached one of the episodes and swelled it into a separate poem, entitled 'Floridante,' which was published after his death by his son. He also wrote five books of 'rime,' eclogues, hymns, odes, sonnets, and other lyrics, some of which are admired for their imagery and smoothness of versification. He introduced in the Italian language that species of poetry which is called 'pescatoria' and 'marinarecca,' being descriptive of the habits and occupations of fishermen and mariners. His letters have been published in three volumes.

(Corniani, Secoli della Letteratura Italiana; Tiraboschi, Storia della Letteratura Italiana; Panizzi, Introductory Notes on the Romance Language and Poetry of the Italians, prefixed to his edition of 'Bojardo.')

TASSO, TORQUATO, son of Bernardo, was born at Sorrento, in 1544. At the age of ten he was sent for by his father, then an exile, and after some time spent with the Duke of North Italy, he was admitted to the University of Padua to study law, for which however he had little inclination. At the age of eighteen he composed his first poem, 'Rinaldo,' in twelve cantos. The subject is romantic, and is taken from the old chivalric legends concerning Charlemagne and his followers. Bernardo Tasso was at first angry with his son for neglecting his more serious studies, but at last he relented, and gave his consent to the publication of the poem, which Torquato dedicated to Luigia Ede, the daughter of the Duke of Lara II., Duke of Ferrara. In 1566 the cardinal took him into his service as a gentleman attendant, and introduced him to his brother the duke, and to his two unmarried sisters Lurcezia and Eleonora. He was well received by all, and admitted into their familiar society. Tasso was young and amorous; he had been for some time passionately in love with Laura Peperara, a lady of Mantua, to whom he addressed many sonnets and other verses after the manner of Petrarch, styling her his Laura. This lady, with whom he was in constant correspondence, promised to pay his debt to his father at Mantua in 1564, came some years after to Ferrara as a lady of honour of the duchess, and was married to Count Turchi of Ferrara. But in the mean time Tasso had been struck with the admiration of the countess Eleonora, the duke's sister, and already in 1566 there is a sonnet by him, beginning 'Nei tuo petto reale da v'opra sparite,' which is evidently addressed to a princess of a sovereign house. From that time he continued to write amatory verses evidently addressed to the same person, whom he styles his 'donna,' or mistress. In some of them he mentions the name of Eleonora, but as there were several ladies of that name at different times at the court of Ferrara, this has given rise to various surmises about the person meant. At last Tasso avowed in several ways his love for the princess, though from the then existing usages of society, it was impossible that he could ever obtain her hand. Most of his sonnets and other verses, which are evidently intended for this object of his second love, are conceived in a respectful and somewhat melancholy strain, as if the writer felt the hopelessness of his passion. The disparity of rank was in those times an insuperable obstacle to any permanent attachment, and the house of Este was one of the proudest in Italy. Like Petrarch, Tasso seems to have obtained friendship only in return for his love. But there are some of Tasso's sonnets written to another or rather more distant princess, in which he assumes the tone of a favoured lover. Such are the two sonnets 'Donna di me doppio vittoria aveste' and 'Prima collaelta voi mi veneste,' the dialogue between love and a lover, beginning 'Tu chi' piu chiusi affetti,' and the madrigal which begins 'Soffisime bacii.' From the context, although no name is mentioned, they all evidently allude to the same object as the
other amatory verses addressed to his 'donna.' There are also some autograph lines of Tasso discovered by Mai among the Faloneieri MSS., and published by Betti at Rome (Giornale Arcadico, October, 1827), in which Eleonora is mentioned by name.

'Quando scende la d'Este mina, Poesie godetene in libertate e sonse? Ah, pianga il deh! tutto mi dice, Addio, belo! Addio mondo.'

It would appear that these verses, having been abstracted from Tasso's papers by some enemy, and shown to Duke Alfonso, first roused his suspicions.

Professor Rosini, in his able essay upon the 'Love of Tasso and of his Imprisonment,' Tisa, 1832, points in opposition to the assertion of Serassi and others, that Eleonora d'Este was the object of the above compositions, as well as of all the others addressed to his 'donna.' It is the four compositions last alluded to that constitute the real guilt of Tasso: they boast in pruntum language of favours received, which, according to the best circumstantial evidence, were never granted, and which, if even granted, ought not to have been mentioned. And Tasso himself must have felt this, for when he set out for France at the beginning of 1571, to accompany Cardinal Luigi d'Este on a mission to Charles IX., he left his MSS. in charge of his friend Rondinelli, with directions to publish them in case he should die abroad, 'except those which he sent to Eleonora, the cardinal's daughter, and which must be buried with him.'

This was a subterfuge to conceal the object of the above-mentioned compositions, and to make them appear as if written at the request of the cardinal. But it has been pointed out that the verses are not very well-adapted for a man of genius. However, before the end of the year 1571, Tasso took his leave of the cardinal in France. It would appear that while in that country, where he was introduced at the court of king Charles IX., and became acquainted with the French poet Ronsard, Tasso applied himself to study the points of controversy then debated between the Roman Catholic and the Reformed churches, and that his investigations of those delicate matters displeased the cardinal, who spoke to him strongly on the subject. At Ferrara, he discovered other and secret reasons for wishing to return to Italy. Having returned to Ferrara, he entered the service of Duke Alfonso himself, by whom he was most graciously treated. The duke extolled his poetical talent; he often listened to the recital of his verses (Tasso was then engaged upon his 'Gerusalemme,' which he intended to dedicate to the duke); he admitted him to his own table, and to his own familiar society; and he refused him no favour that he chose. (Della Credé: Riedel: Mancini: Cei: Ruggi Amori di Tasso.) Such was the conduct of Duke Tasso towards the poet, until he discovered, years after, his guity compositions. Whilst Tasso was thus a favoured guest, rather than a dependant of Duke Alfonso, he wrote his pastoral drama, the 'Aminta,' in which he portrays with exquisite skill the pangs and the delirium of love deemed hopeless for a long season, but in the end required. The drama was performed at the court of duke Alfonso, and its fame soon spread abroad. Lucrezia, Eleonora, the sister, who had married Francesco Maria, duke of Urbino, wishing to hear the 'Aminta,' invited Tasso to her court, where he remained several months. This was in 1573. While Tasso was at Ferrara, one day was busy at work against him to lower his credit with Duke Alfonso, whilst the same time Guaino, the poet, who was also at the court of Ferrara, strove to ingratiate himself with the princess Eleonora, and this excited the jealousy of Tasso. It appears that Tasso had been in the habit of writing to the princess, and sending her some of his poetical compositions; but now he wrote none for several months. At last he wrote her a letter, dated September, 1573, which was first published by his biographer Serassi, in which, after apologising for the long silence, he says: 'I refer to you the copies, which,' he says, 'is not like those fine ones which I suppose your grace is now wont to hear very often,' alluding to those of his rival Guarino. And he goes on to say, that his verse has been in the common style, and the author is poor of luck. This last expression, as understood as referring to his circumstances, for he was still in favour with both the courts of Ferrara and Urbino, and was receiving at the time presents from the duchess Lucrezia of Urbino. But still he sends to the princess Eleonora the sonnet, 'hoping that, whether good or bad, it will produce the effect that he wishes.' This sonnet, which begins: 'Sdegno, debil guerrier, campion audace,' is that of a defending knight, who, for his sake, he conceives it is better to be lightly borne, that the 'sonnet is not written on his own account, but at the request of a poor lover, who having been for a time angry with his mistress, is now no longer able to stand out, and surrenders himself as a subject of her anxiety.' This and other similar verses, referred to by Professor Rosini in the above-quoted essay, prove that the princess Eleonora had been long aware of Tasso's passion, and felt flattered by it, but probably looked upon it as a poetical feeling, for which she would have wished to dispel the poet in several places; and yet this same man had already written, in the recess of his study, the guilty compositions which have been mentioned above.

Towards the end of 1573 Tasso returned to Ferrara, where he applied himself to finish his great epic poemes: 'La Gerusalemme.' The touching episode of Olibio and Sofronia, in the second canto, was meant to portray his own situation with regard to the princess Eleonora; and in a sonnet which he wrote to tell, he evidently speaks of the character of Sofronia as meant to represent herself.

Parts of the 'Gerusalemme' began to circulate about MS., and the author was assailed by numerous pedantic critics. He thought that the duke and his sister Eleonora would not like him for his defence of a slight sink deep into the poet's heart. Towards the end of 1576 a false friend, who was in the secret of his love for the princess, disclosed some particulars of it to others. Tasso, who was a good judge of character, fell into a violent passion, and was in the ducal palace, required him to deny what he had said, and upon the other's refusal, gave him a blow in the face. Tasso led to a duel; the treacherous friend came escorted by his relatives, who also drew their swords against the poet, but Tasso, who was a good swordsman, was able to parry their blows, and came away in triumph. Nothing particular happened after this until June of the following year, 1577, when Tasso, on the evening of the 17th of June, being in the apartments of the duchess of Urbino, in Duke Alfonso's house, fell into a violent passion, and in the course of some impertinence real or supposed of a domestic, and forced himself so far as to throw a knife at him. He was immediately arrested by order of duke Alfonso, and confined to a room which looked on the court of the palace. It appears that between those two incidents his own sword had been tampered with in order to give up his concealed papers. Tasso got information of this, and looked out for a trusty servant from Urbino, and wrote on the subject to Guido Gabbrielli, that he had in his possession a letter by his biographer Serassi. He had also felt for some time scruples about matters of faith; he mentions in his discourse to Scipione Gonzaga, that he had doubts concerning many points of religion; he had even applied to the inquisitor of Bologna, who had granted him a dispensation for that time, but still he thought himself under the censures of the church. All these things added to the anguish of his mind. From the place of his imprisonment Tasso wrote a submissive letter to the duke, begging his pardon, and the duke appearing to forgive him, released him after a few days, and took him with him to his country-seat of Beiguardo about the end of June. What happened there between the duke and Tasso is not ascertained, but from some details of the following year, it can be seen that the poet was closely and sternly examined by the duke, who had probably by this time in his possession Tasso's papers, in order to get from him an acknowledgment of what, if avowed, would involce him against him.' (Tasso's Sonnet, beginning 'Al duca Francesco d'Alcide, in presenza di duce Hercules, father of Alfonso.' On the 11th of July the duke sent Tasso back to Ferrara under an escort, and shut him up in the convent of St. Francis, his secretary having indicated to him that he was no much, and must be treated as a madman. Tasso's love adventures, his real or pretended madness and the causes of his long imprisonment, made much noise about Italy at the time; and they have been so much the subject of controversy and comment and have acquired an historical importance, especially as they serve to illustrate the manners of the times. Duke Alfonso has been much abused, and, we think, without discrimination, for his treatment of the poet. There is a
mystery about the whole story resembling that which hangs over Ovid’s banishment. Professor Rosini has collected with the greatest patience and care the discordant opinions, as well as the evidence resulting from Tasso’s own writings, published and unpublished, and from those of his contemporaries; and the conclusion which arises at the help of sound criticism is, that the Duke, having in his hands the loose compositions of Tasso already mentioned, which joined to his other compositions addressed to the same person, and his other studies, and to the sentiments which he entertained of his own sake, and in which the kind of his highness was to have been treated very kindly at first by the attendants of the hospital. He wrote to the duke, and to the princesses, but in vain. At last he grew more calm, and was treated with greater leniency. The Duke, however, was not held to be a culprit, and his prison is no longer believed by competent judges to be the identical place of his confinement. (Valeric, Voyages Littéraires en Italie, book vii., ch. 14.) Political party-feeling in our age has contributed to exaggerate the hardships of Tasso’s confinement, as religious party-feeling has exaggerated the sufferings of Galileo in a similar condition. There was hardship no doubt in both instances, and the hardship in Tasso's case was aggravated by the exile and unsatisfied mind. When Scipione Gonzaga visited Tasso at St. Anna, in the spring of 1590, he was lodged in a large and commodious apartment, where he could write and correct his compositions. In November of the same year he was visited by Montaigne, who speaks of the poet as being overborne by the vivacity of his imagination. In July, 1581, the Lady Marghera d’Este obtained leave of Alfonso to take Tasso with her for a few days to her country-house, where he had a philosophical conversation with her and her two ladies of honour, Tarquinia Molza, a learned woman, and Ginevra Marzio, upon the nature of love. From the recollection of this conversation, Tasso afterwards composed his dialogue, which he entitled ‘La Stanze.’ In September, 1582, Tasso was received at St. Anna the visit of Aldo the younger, who brought him copies of some of the finest editions which had come out of his press, and they spent two days together in speaking of their respective studies. Tasso in the meantime was busy writing, or correcting various poetical compositions which were printed at Venice, but very inaccurately, to his great annoyance. He wrote in his confinement several philosophical discourses or treatises, such as “Odua II Gonzaga, ossia, The Discourse of Alfonso Dalle Stanze della Carlita, the discourse ‘Della Virtù Eroica e della Cartita,’ the discourse ‘Della Nobilita,’ and others. In his discourse to Gonzaga he says that it was wished that he should become insane, and that the cause, or at least one of the causes, of his sufferings was false visions.

In 1588 Tasso grew seriously ill, he complained of his head, of his digestion, of singing in his ears, and other symptoms of a like nature. He consulted his friend Mercuriali, a physician of Padua, but Tasso was not a delicate patient; he wished for none but pleasant medicines, and he would not submit to a total abstinence from wine. One of his vagaries was that he had a familiar spirit who appeared to him to comfort him. In 1584 he was large allowed to be out at leisure during the Carnival season, and he wrote a curious dialogue on that circumstance entitled ‘Il Gianluca, o della Maschere.’ He enjoyed the society of Tarquinia Molza, of Count Girolamo Popoli, and other noblemen and ladies of the court of Ferrara. In the fall of that year he wrote about the Bistrami, overo della Cortesa: ‘Il Malpiagio, overo della Corte;’ ‘Il Ghirliaone, overo dell’ Epitalo;’ ‘La Cavalletta, overo della Poesia Toscano;’ and ‘Il Ragone, overo della Pace,’ which last, introduced Bianca Capello, grand-daughter of Tuscany, is dated from his apartments of St. Anna, ‘Dalle sue stanzie in St. Anna.’ He was nowtolerably composed and reconciled, and could hardly be called a prisoner. In one of his autograph letters, written to the Duke of Ferrara, Tasso, which is preserved in the library of Ferrara, there is a passage copied by Valery, in which he says that ‘the duke does not keep me in prison, but in the hospital of St. Anna, where priests and monks can visit me at pleasure, and do me good.’ In several of his unpublished letters he gives directions about some articles for his wardrobe or his table, and shows a refined taste in both. But
In that same year, 1585, a fresh source of vexations opened up upon him. His great epic poem, 'La Gerusalemme Liberata,' had been published complete at Parma in 1585, and, at the time of its publication, the Duke of Mantua, a host of Counts and others had been heard to claim it as their own. This being agreed upon, Cardinal Cinzio hastened to announce the news to Tasso, urging him to repair to Rome as soon as possible. Tasso did not seem at all elated; he observed to Manso that he thought it more glorious to describe whole series of episodes, even if they were ever so slight, and took an affectionate leave of his kind friend Manso, with a foreboding that it would be the last.

He spent the Christmas festivities at the monastery of Monte Casino, and arrived at Rome in the beginning of the following year, 1586. He met there with some of the men and attendants of the Papal court, by whom he was led in a kind of triumph to the Vatican palace, where he was introduced to the Pope, who told him that he had accounted him the first of the laurel-crowned poets of the age, as much honoured by him, as in former times it had served to honour others. Tasso was lodged in the Papal palace, and treated with the greatest regard. While the day of the coronation was anxiously expected, Cardinal Cinzio ill; and Lent coming on, the pageant was postponed, and then Tasso himself fell seriously ill. He fell from the first a conviction that this illness would be his last; and wishing to compose himself in retirement for his last moments, he expressed a wish to be taken to the monastry of Monte Casino, and be carried thither in one of Cardinal Cinzio's carriages, he said to the prior and his monks who came to receive him at the gate, 'I am come to die amongst you.' He was led into a comfortable apartment, where he remained seven days, and never left it, excepting for the necessary practices, and seemed totally weaned from worldly feelings and cares. When the pope's physician announced to him his approaching death, he embraced him, thanking him for the happy tidings. The Cardinal Cinzio, who came to take leave of him, expressed his gratitude for all his kindness; and as the cardinal and those present could not refrain from tears, he said to them, 'You think that you are leaving me, but I shall go before you.' He expired on the 25th of April, 1586, after finding himself in the same situation as on former occasions, and finding that he was about to die.

He was buried, according to his desire, in the church of St. Onofrio, with a plain slab over his tomb, upon which the monks engraved the simple inscription, 'Torquato Tasso ossa jacent.'

The last fame of Tasso as a great poet rests upon his 'Gerusalemme Liberata,' or 'Il Goffredo,' as it is sometimes called, one of the few great epic poems of which the world can boast. The action is complete; it reduces every leisure, every rage, every great personage to the possible object of that expedition, the deliverance of Jerusalem from the hands of the Moamen. The beauties as well as the faults of the composition, have been the themes of many disquisitions. Among foreign critics, Blair, Voltaire, Viger, and others, all have had something to say in praise of this poem. The poem has a peculiarity that distinguishes it from most other epics: it is essentially a Christian poem; and breathes throughout the feelings, the faith, and the hopes of a Christian. Tasso, as he says in his invocation,
Tassoni's 'Jerusalem Liberata' has been translated into most European languages. The English translations by Firth, Hoole, Broadhead, Hunt, and Witten. It has also been paraphrased into several Italian dialects, Milanese, Neapolitan, Calabrian, &c. The Life of Tasso has been written by Manzo, Serausi, and others, and has been numerous foreign critics, by Muratori, Zeno, Maffei, and other Italian philologists.

TASSO'NI, Alessio/Niro, born of a noble family at Modena, in 1565, was educated first in his native town, and afterwards at Bologna and Ferrara, where he studied the law. His first work is the epic of the life of Cardinal Asciano Colonna, whom he accompanied to Spain in the year 1600. In 1603 the cardinal, having been made vice-roycy of Aragon, sent Tassoni to Rome to take charge of the administration of his property in Italy. During his absence he published a treatise, 'Diino e Incredullis,' which was well received by the learned world, and established the internal state of that kingdom; which, after alarming all Europe in the preceding century by its ambition and the extent of its conquests, was now fast sinking into decay under the weak government of its Emperor. When he wrote his 'Considerazioni sopra il Petrarca,' published in 1609, in which he commented very severely upon numerous faults, real or supposed, which he pointed out in the writings of that generally admired poet. Endowed with an ironical wit, he castigated many of the most important men of his time in his writings at opposing received opinions, and he employed sarcasm and ridicule for the purpose. Aromatari of Assezi took up the defence of Petrarch in his 'Risposte' to Tassoni's considerations, and this led to a controversy in the form of epistles. Tassoni was appointed to be Professor of the Physics of Aristotle, although he does not seem to have had himself very correct notions of physical phenomena. This work led to another controversy between Tassoni and several of his contemporaries. Meantime the Cardinal proceeded a discussion upon the natural and artificial employment, applied to Charles Emmanuel I., duke of Savoy, who promised him the post of secretary to his son, the cardinal of Savoy. But partly through court intrigues, and partly on account of Tassoni's known aversion to the court of Spain, with which the Duke of Saxony wished to be on good terms, he was kept waiting for years before he could take possession of his office at the court of the cardinal, who was then residing at Rome. Certain compositions entitled 'Filippiche,' written upon this subject, were published as a pamphlet entitled 'Essiue della Monarchia di Spagna,' which appeared during that period, were generally attributed to Tassoni.

Tiraboschi thinks that the first two of the 'Filippiche' are Tassoni's, but that the other two are by another pen. Copies of this work are very scarce. In 1623 Tassoni left the cardinal of Savoy in disgust, and retired to a country-house in the suburbs of Translvere, where he employed himself in study and rural occupations. About this time he left his first wife, and married a noble woman who entered his household the same year. Tassoni wrote in his own hand and the following dispatch written underhand:

* Detesta cur farm quaera minues gravet Isomrum? Longi opites moriems non fide: saepe decepta tarn submersa.*

In 1629 Cardinal Ludovico di Colonna and Pope Gregory XV., took Tassoni into his service, and gave him apartments in his own palace, with a handsome stipend. After the cardinal's death, in 1632, Tassoni repaired to Modena, when he was made 'councillor to his sovereign Duke Francis I. of Este, for the remainder of his life. He died at Modena in 1635.

Besides the works already mentioned, Tassoni made an abridgment in Italian of the 'Annales' of Baronius, and some 'Annotazioni,' or corrections and additions to the Italian vocabulary of La Crusca. But the work for which he is best known is his mock-heroic poem, 'La Scelica Rapita,' or the 'Rape of a Bucket.' He is considered as the author of the first kind of this position in the Italian language, as he had finished, though not published, a part in his, in print, his poem years before his contemporary Bracchioli published, in 1618, his 'Scherno degli Dei,' in which he turns into ridicule the gods of the antient mythology. When Tassoni's poem was published in a printed form in 1627, but MS, copies had been in circulation long before. The subject is taken from the annals of his country under the year 1249, when a war having broken out between the two neighbouring cities of Modena and Bologna, the Modenese carried off in triumph a wooden bucket from within one of the gates of Bologna, which bucket is still seen suspended by a chain in the cathedral of Modena. The 'Secchia Rapita' has been generally admired by Italian as well as by foreign critics, as they are, although he has borrowed from it (Valery, Voyages d'Érasme, &c.), but Perrault and other French critics have done Tassoni full justice. The humour of the poem is peculiarly Italian, and the admixture of the serious and heroic with the burlesque makes it a very singular production. Some of the scenes are exquisitely soft and true to nature, such as the song in canto viii., which begins: *Dormiva Emidionia tra 'erbe e i fiori,* and the beautiful episode in canto x. of the voyage of Venus from the mouth of the Arno to the coast of Spagna, which has been collected by various judges and critics upon this poem in his biography of Tassoni. Muratori has also written the Life of Tassoni.

(Tiraboschi, Storia della Letteratura Italiana; Corniani, Storia della Letteratura Italiana; Zeno, Note sul Fontana.)

TASTE. The organs of this special sense are certain parts within the cavity of the mouth, obviously so disposed as to take early cognizance of matters about to be swallowed, and to act as sentinels for the remainder of the alimentary canal, at the entrance of which they are situated. Their special endowment, aided by an exquisite development of common sensibility, enables them to give timely notice of any acid, caustic, or nauseous quality, of any change in the fluid temperatwe, or in the temperature, irregularity, size, or sharpness in the material submitted to them, and thus to protect the stomach against the intrusion of many hurtful agents. These organs moreover establish for our appetites a scale of liking and disliking: they are pleased or displeased with the various sensations which the organs of hunger: they modify that merely quantitative ingestion, which is an absolute and daily need of the organism, with a qualitative choice, and so give a motive to those variations in diet which experience proves to be beneficial to the body.

Common language (as in the word palatable) seems to attribute the sense exclusively to a part, which is by no means the only or chief seat of it. In order to give a more correct notion of its extent, we shall first briefly sketch the arrangement of the membrane which lines the cavity of the mouth. It is a continuation (a tubular folding in, as it were, through the aperture of the lips) of the general integument, the skin; and although somewhat changed in its grosser characters, it yet preserves, under the adaptation of the membrane, a close resemblance to the parent tissue. It lines the inside of the cheeks, invests the alveoli, or gums, giving to those parts their polished smoothness of surface, is reflected from the lower alveolar arches to the tongue, from the upper to the cheeks, and to the palate; and both these organs prolonged backward into the throat. In its palatine portion, the membrane covers the horizontal processes of the upper jaw, which divide the cavity of the mouth from the throat. This case, as Dr. D. of a solid frame-work, is said to belong to the hard palate; and it likewise extends backward, beyond the limits of this bony partition, to form a pendulous flap, called the soft
palate; which, with the nipple-like uvula, that hangs from its extreme edge, may readily be seen when the mouth is opened. In extending to the tongue, the tongue-tip, the tip of the tip, and the whole of that organ prominent and free; and is remarkably developed into a vast number of minute eminences called papilla, which cover the borders and surface of the tongue, are largely supplied with nerves, and, above all, with the sense of taste and of the functions in the part. [TONGUE; PALATE.]

Very careful experiments on the sense of taste have been made by MM. Gayot and Admany (Mémoire sur le Sûgo du Goût chez l'Homme, Paris, 1830), from which no facts follow but what are established. A tiny portion of the soft palate, just above the base of the uvula, the remotest part of the back of the tongue, where it corresponds to the isthmus of the palate, and the entire circumference of the tongue, are so enveloped with the mucous surface of the cheek, the hard palate, the gum, the remaining parts of the soft palate and of the tongue are entirely destitute. Thus, those parts of the tongue with which, in sipping or in masticating, the food would contact (its borders, and, most eminently, its tip), are gustative; and the property is shared, though in a less degree, by the lingual and palatine surfaces of the isthmus through which the food enters the sphere of involuntary actions. The nerve, specially endowed with the sense of taste, is a branch of the third of the fifth cerebral nerve, called, from its function, gustatory; but it seems possible to some physiologists that the glosso-pharyngeal nerve shares this property. The gustatory nerve is distributed to the papillae linguae, especially along its border, and this tip; the lingual part of the glosso-pharyngeal nerve is restricted in its distribution to the posterior part of the tongue, where it supplies the mucous surface exclusively. For the sensation of taste, moisture must be present; all are familiar with a temporary impairment of the sense, under the influence of unusual dryness of the surface of its organs; the parched tongue of fever is notoriously indifferent. Matters are not tasted when they exist in a fluid form; an insoluble body is insipid; a solid body provokes an immediate flow of saliva, and its rapid qualities are perceived in proportion only as it dissolves; certain gases are alleged to excite sensations of taste; but it is only by such as are soluble in the saliva (salpurrhus acid, for instance), and only in proportion as they are dissolved that these impressions are produced.

"The sensation of taste undoubtedly admits of an immense variety of modifications which no language can express. A man who has tasted all the species of wines, he would hardly find two of them that had precisely the same taste; the same thing holds in cheese, and in many other things. Yet of five hundred different tastes in cheese, or four hundred in pastry, so as to cause a distinct notion of them to one who had not tasted them." The vague, or not-to-be-described, nature of gustatory impressions, as here expressed by Dr. Reid, receives some additional obscurity from the circumstance that taste and smell are often simultaneously affected in a manner which renders it difficult to abstract either. Various substances, after exciting the sense of touch on the fauces, and that of taste on the tongue, are capable of producing a third impression, which is popularly referred to the palate, but is really felt upon the sentient membrane of the nostrils; the fume of certain kinds of food ascends into the cavities of the nose, and produces this third and distinct sensation; in administering medicine to children, it is well known that the greater part of what is disagreeable in its flavour may be avoided by closing the nostrils when the draught is swallowed; and by repeating this experiment upon various articles of food, it is easy to ascertain how much of their flavour is derived upon the sense of smell, and how much is appreciated by the other. Mr. Mayo, who painted different forms, and wrote that his graph is quoted, goes on to classify the impressions produced by substances taken into the fauces:

1. Where sensations of touch alone are produced, as by red wine, beer, or cider.
2. Where, in addition to being felt upon the tongue, the substance excites sensation in the nostrils, as for instance, salt and tobacco, and other odorous metals.
3. Where, besides being felt upon the tongue, it produces sensation in the nostrils, as for instance, sugar and salt.
4. Where the substance is felt on the tongue and tasted by it, and in addition excites a sense of flavour in the nostrils, as, for instance, bread, manna, and other substances. (Outline of Physiology.)

Flavour, then (in distinction from taste), can in correctness be attributed only to bodies possessed of some savour or volatility; and, by alternating smelling and tasting such, and by contrasting their impression with that produced by the same article simply tasted, (and not, as is commonly done in the two cases), it will be noticed that flavour is but an odour, which, from its affecting a comparatively unpractised part of the olfactory apparatus, is at first imperfectly and incompletely conveyed to the brain, and is consequently observed in the animal possessing a digestive savour. No special organ for its exercise (with very doubtful exceptions) can be traced in the invertebrata; nor can we presume to infer in them the presence of taste, otherwise than as an obscure sense determined by their choice or repugnance of food: to this extent it undoubtedly exists in them, even to the bottom of the scale—to the infusory animals, a which Ehrenberg has witnessed its exercise. Among the lower animals, the sense of smell is less acute, than among the higher; and in the class of mammals it is gradually augmented in savouriness; but although in certain orders of them, or in particular individuals, the sense appears sharp and the appetite fastidious, it is probably in man alone that the organs of the organ constitute the subject of the present discussion.

TASTE, according to the definition of Sir Joshua Reynolds, 'is that act of the mind by which we like or dislike whatever be the subject.' (Discourses before the Royal Society; Discourse vii.)

Taste is frequently spoken of as a gift, as something independent of rules, a kind of instinct, bestowed not liberally in degree upon some men than upon others. It has been treated by some writers as the result of caprice or fashion, as having no uniform or permanent principles. Sir Joshua Reynolds has declared it to be an attribute of the indifferently cultivated, and has distributed it into different complex elements, whose joint development is determined by certain principles of beauty or sublimity, that exist externally.

As has been quoted as apparently sanctioning the idea of taste being a kind of gift or instinct. "A man cannot tell," he says, "whether Apelles or Albert Durer were the more skillful: whereof one would make a persuade of geometrical proportions, the other the best parts out of divers faces to make one excellent. The painter must do it by a kind of felicity, and not by rule." Sir Joshua Reynolds has overthrown this position in his sentence: 'Every object which pleases must give us pleasure upon some certain principles.' These principles are unquestionably so intelligible that they may be embodied in the form of words, and may be drawn out into rules.

Burke, towards the end of his essay on Taste (introduced to the Sublime and Beautiful), has likewise adverted to this position, which we will come under notice again in the course of this article.

The hypothesis which refers our emotion of taste to the influence of fashion, or temporary and varying causes, has been maintained in the Inquiry into the Principles of Taste. (The author, Mr. Burke, has not, however, made a more general principle, and Mr. Knert, there is scarcely any subject upon which men differ more than concerning the objects of their pleasures and accruing; and this difference subsists not only among individual classes of mankind, even among the same ages and every nation has its own peculiar modes and ideas of excellence in these matters, to which it pertinaciously adheres, until certain people have acquired such an ascendency in power and reputation as to set what is called the fashion, when this
fashion is indiscriminately adopted upon the blind principle of imitation, and without any consideration of the disposition or nature of the object, whereas there are two different ways of proceeding in such a case. One is, that every one who presumes to deviate from it is thought an old and mortal, a humorist void of all just feeling, taste, or elegance. The fashion continues in the full exercise of its tyranny for a few years or months, when another, perhaps still more absurd, is substituted in the same way. It is not possible to enumerate them all; but let me state that they have taken place within the last two centuries. Example, illustration. . . . 'Let no one imagine,' says Mr. Knight, 'that he solves the question by saying that there have been errors in taste, as there have been in religion and philosophy: for the cases are totally different.

This argument is founded on an exaggeration of a fact: it is reference to the philosophy of taste admitted by those who contend that taste is determined by some definite and invariable principle or principles, which forms the general head of the influence of association on our emotions of this order. Mr. Dugald Stewart has observed on the exaggeration in question, that the association of ideas can never account for the origin of a new notion, or of a pleasure essentially different from all the others which we know. It may indeed enable us to conceive how a thing indifferent in itself may become a source of pleasure by being connected in the mind with something else which is pleasurable for another; but it does not come in to the existence of those notions and those feelings which it is its province to combine: insomuch that it will be found wherever association produces a change in our judgments in matters of taste, it does so by cooperating with some natural principle of the mind, and implies the existence of certain original sources of pleasure and uneasiness. This suggests a distinction in the circumstances which please in the objects of taste, between those which please in consequence of casual associations and those which please in order: The pleasure in the latter depends on the degree in which the mind is free from casual associations; in reference to the first it depends upon the facility with which such associations are excited and produced. (Discourse III.)

The different modes in which association operates have been illustrated with much elegance, and their true place in the philosophy of taste distinguished, by Mr. Alison: 'Fashion,' he remarks, 'may be considered in general as the custom of the great. It is the dress, the furniture, the language, the manners of the great world, which constitutes what is called the fashion in each of these articles, and which the rest of mankind are in such haste to adopt after their example. Whatever the real beauty or propriety of these articles may be, it is not in this light that we consider them. They are the signs of that elegance and taste and splendour which is so liberally attributed to elevated rank and station. When I use the word taste, I mean it in a different sense from all the others which such situations bestow; and they establish a kind of distinction between this emvied station and those humble and mortifying conditions of life to which no man is willing to belong. It is in this light therefore of this connexion one may consider them and allow with very sound reasoning affect us with the same emotion of delight which we receive from the consideration of taste or elegance in more permanent instances.' (Essays on Taste, Essay 1.)

This theory (the principle of which extends to other objects of taste perhaps more than to that of Mr. Reynolds) reconciles the apparent inconsistency, insisted on by Mr. Payne and other writers of the same school, between the decisions of taste in one country and in another, as tending to show that the standard of taste is essentially arbitrary and that the choice among objects of beauty and unfitness is a matter of personal opinion. This result of the process which has been described applied to the coloured inhabitants of Africa, as the ideal beauty of the European is the result of the same process applied to the inhabitants of Europe. To institute a comparison between the beauty of the European and that of the African, and to conclude that taste has no invariable Vol. XXIV. 0
principles; as its foundation, from the opposite decisions on such a comparison, involves the same description of error as it would be to arrive at the same conclusion from the opposite decisions in a comparison between the beauty of two distinct species of animals, the one biped and the other quadruped. There is a central principle of beauty peculiar to the different races of mankind; to the two sexes of the different races; to different ages; and so on in reference to inferior animals and objects of inanimate nature. We trespass beyond the province of mere taste when we compare objects with respect to which the principles of beauty are altogether distinct.

Much obscurity has arisen in discussions on the subject of taste from the twofold sense in which the word taste has been used, and as expressed by the term emotion, and a something objective in which there exists an aptitude to produce emotion. The term taste strictly applies to the emotion only; the theory of the different causes by which the emotion is produced belongs to the subject of beauty. We have been obliged to refer to the theory of beauty in the preceding part of this article in establishing the reality of certain principles determining our emotions of taste: in what follows we shall confine ourselves to the explanation of derived or proper sense.

When any object either of sublimity or beauty is presented to the mind, we are conscious of a train of thought being immediately awakened analogous to the character or expression of the original object. The landscapes of Claude Lorraine, the poetry of Milton, the excite feeble emotions in our minds when our attention is confined to the qualities they present to our senses, or when it is to such qualities of their composition that we turn our regard. It is then only we feel the sublimity or beauty of an object when we imagine it kindled by their power, when we lose ourselves amid the number of images that pass before our minds, or when weaken at last from the play of fancy as from the charm of a romantic dream.

Mr. Alison has supposed that not only the whole succession is accompanied with that peculiar emotion which we call the emotion of beauty or sublimity, but also the individual ideas of the succession itself produce some effect or other. But to this it has been objected, and we think truly, that such a train of images passing before the mind, and images accompanied with it, must fail to be remembered by us; or, at least, if they are not remembered by us, there is no reason, a priori, to suppose the existence of them. (Brown, Lectures on the Philosophy of the Human Mind, lecture viii.)

There is this distinction between the emotions of taste and all our different emotions of simple pleasure, that in the case of these last emotions no additional train of thought is necessary. The pleasurableness feeling follows immediately the presence of the object or quality, and has no dependence upon anything for its perfection but the state of the sensibility by which it is received. The emotions of envy, pity, benevolence, gratitude, utility, propriety, novelty, &c. might undoubtedly be felt, although we are deprived of mind and memory by which we should lose all our train of ideas, and certainly are felt in a thousand cases when this faculty is unemployed. In the case of the emotion of taste, on the other hand, it seems evident that this process of mind is necessary, and that unless it is produced these emotions are null. Whatever may be the nature of that simple emotion which any object is fitted to excite, whether that of gaiety, tranquillity, melancholy, &c., if it produce not a train of kindred ideas, we are conscious only of that simple emotion. Whenever, on the contrary, the train of thought which has been mentioned is produced, we are conscious of a higher and more pleasing emotion; and which, though it is impossible to describe in language, is a modification of the emotions of simple taste. The emotions of taste may therefore be considered as distinguished from the emotions of simple pleasure, by their being dependent upon the exercise of our imagination; and though found in all cases upon simple emotion, as yet further requiring the employment of the faculty for their existence: (Essays, i., conclusion, s. a. Alison); or, rather than the employment (a word which seems to intimate a deliberate intended act, in the process of imagination), as Dr. Brown would say, the application of the common laws of suggestion in the mode to which we apply the word imagination.

The suggestion of trains of kindred or harpmonious images has been pointed out as distinguishing the emotion of taste, accounts for the more enlarged sensibility in some than in others of this emotion. More our ideas are increased or our conceptions extended upon any subject, the greater the number of associations we can bring into play, and the more constantly or beauty is given to that object or beauty we receive from it. 'What is it?' (says Mr. Alison) 'that constitutes that emotion of sublime delight, which every man of common sensibility feels upon the first prospect of Rome? It is not the scene of destruction which is before him. It is not the Tiber, diminished in his imagination to a paltry stream, and stagnating and mused by that magnificence which it once adorned. It is not the triumph of superstition over the wreck of human greatness, and its monuments erected upon the very spot where the first honours of humanity have been gained. It is ancient Rome which fills his imagination. It is the country of Caesar, and Cicero, and Virgil, which is before him. It is the mistress of the world which trees, and supports, and is the subject of his use, and duties, to give laws to the universe. All that the labours of his youth or the studies of his mature age have acquired, with regard to the history of this great people, open to him once before his imagination, and present him with a field of thought and solemn imagery, which can never be exhausted.'

'The beauty of a theory or of a relic of antiquity is unattainable to a peasant. The charms of the country are useful only to a citizen who has a place in town.' It is on this principle in question that Burke remarks that the excellence and force of a composition must always be imperfectly estimated from its effect on the minds of any, except we know the temper and character of those minds. (Introduction to the Sublime and Beautiful.)

The rules by which taste is determined vary with the objects to which its decisions refer; but in respect to all this general principle holds, that a composition is to be judged by its effect on the objects which engage it. If to please, to instruct, to move, to create laughter, benefits in its design, its merits are to be determined by its aptitude to produce any of these effects. If its objects be to please, then only a particular people or class, it is to be under consideration; for other circumstances, like an aptitude to give pleasure or instruction to all ages and conditions of society, it is to be estimated by its correspondence with those universal principles of human nature which it contemplates. That composition which lighted up by a smile of pleasure was taken with the last description. (Hume's Essay on the Standard of Taste.)

The reader who may desire to see this subject further discussed is referred to the article Beauty; to Mr. Alison Essays; to Brown's Lectures on the Philosophy of the Human Mind, lecture viii; Hume's Essay on the Standard of Taste.

TATARS. (Tatars.)

TATE, NAHUM, was born in Dublin in the year 1825. His father was Dr. Faithful Tate, a clergyman in Ireland. He was educated at Trinity College, and was removed to London. On the death of Shadwell in 1800 the interest of Tate's friends procured him the situation of poet-laureate, which he held till his death. He seems to have been an imprevident man, and somewhat addicted to intemperance. In the latter part of his life he resided in the precincts of the Mint, in Southwark, where he died August 12, 1715. The Mint was then considered a privileged place, where debtors were not liable to arrest. This supposed privilege however was put down by statute 9 Geo. I.

Tate wrote 'Memorials for the Learned, collected out of eminent Authors in History,' 1805; 'Characters of our Country's Poets,' and attended the composition of a Treatise of Joseph Hall, Bishop of Exeter, Lond., 1811; Miscellaneous Sacra, or Poems on Divine and Moral Subjects, Lond., 1668, 8vo.; Panassus, a Poem on Two
London, 1700; besides Birth-Day Odes, and an Elegy on the
death of Queen Mary. He was also the author of about ten
dramatic pieces, tragedy, comedy, and opera,
including an alteration of Shakspere's 'Lea'; which kept
the stage many years, but has for some time been super-
seded by the original.

Tate is chiefly known now by his metrical version of
the Psalms, which he executed in conjunction with Dr.
Niebuhr. Bartholomew Ray (1697-1772) first drew his
attention to the Book of Common Prayer of the Church of
England. This version, though not of high merit, has
deservedly taken the place of the former version by Stern-
ley. Tate's 'Hymn to the Virgin' (Strazenvold). The first
publication was an 'Essay Towards the History of the
Psalms, consisting of the first Twenty, by N. Brady and N. Tate',
London, 1685, 8vo.; this was followed by 'A New Version of
the Psalms of David, fitted to the Tunes used in the
Churches, by N. Tate and N. Brady,' Libel. 1680, with a
Supplement of Church Hymns,' London, 1700, 8vo.
(Baker's Bibliographia Dramatica, by Reed and Jones;
Watt's Bibliotheca Britannica.)

TATIANUS, of Assyria, was a pupil of Justin Martyr,
and whose death he wrote an apology for Christians
under the title of 'A Discourse to the Heathen' ('Apok
στηρικτα, Ελληνων). In this work he gives some account of
his own life. He was brought up in heathenism, the
different forms of which became known to him by his many
travels; and all the contending sects in the various
regions in which he had lived. He then turned his attention to the Old Testament, on
which he thought he saw the impress of truth. Arriving
at Rome, where he practised as a rhetorician, he met with
Justin Martyr, by whom he was converted to Christianity.
After he embraced the Christian faith, he wrote several
opinions, the gists of which may be seen in his 'Dis-
course to the Heathen.' The chief of his heresies were
the Marcionite doctrines of the two principles of good and evil,
and of the evil of matter (Marcionites), and the Valen-
tinian doctrine concerning Aeonis. His followers were how-
ever chiefly remarkable for the practical application
they made of their Marcionite opinions by lives of the strictest
asceticism. They lived in celibacy, refused all luxuries, and
avoided the use of wine, meat, and other delicacies.
Hence they were called Encratites ('εγκρατιοι), Apocra-
tites ('αποκρατιοι), and Hydropristates (ὑδροπριστατη). But
it must be observed that these terms were often
applied to all ascetics. The Tatianians were Encratites, but
all called Encratites were not Tatianians. The date of
Tatian's heresy is placed by Eusebius in the year a.d. 172.

Of his lost works the chief were a treatise on 'Perfec-
tion after the Pattern of the Saviour' ('ερωτο τοις κατ' εις τον
σωτηριου), and a 'Harmony of the Four Gospels'
(τρι-λεγομενα). The latter was more particularly noticed
by Theodoret, who found 200 copies of it in the
Syrian churches, which he took away from the people on
account of the heresies contained in the book. For
this reason, Tatian was the highest stock of the
heresies. Tatian was not simply compiled from the narratives of
the four Evangelists, but contained also many things out of
the Apocryphal Gospels. Some writers, among whom is
Lardner, think that Tatian's 'Harmony' is still extant in an
Arabic MS. in the Vatican Library.

His 'Apology' is usually printed with the works of Justin
Martyr. There are separate editions of it by Gesner,
Zürich, 1546, fol.; and by Wortz, Oxford, 1700, 8vo.
(Eusebius, Hist. Eccl., iv. 9; Hieronymus, 'Ep. II
Editiones Bibliothecae Palat. Vetus,' Strassburg, 1702; Lardner's
Credibility, pt. ii, c. xiii, &c.; xxxvi, sec. 2; Neander's
Gech. der Christ. Relig. und Kirche, 1, p. 702, and
p. 1311.)

TATIUS, ACHILLES. [Achilles Tatius.]

TATTA [HINDUSTAN, xii. 221.]

TATTERSHELL. [Lincolnshire.]

TATTOOING is the name usually given to the custom,
common among many uncivilized tribes, of marking the
skin by puncturing the derma and introducing colored fluids,
so as to produce an indelible stain. It is
mentioned in Captain Cook's account of the South Sea
islanders under the name tattooing; and, with trifling dif-
ference in the orthography, the same name is applied by
E. Parke to the practice among the aborigines among the
South Sea islanders. The word 'tattoo' appears to be formed by a reduplication
of a Polynesian verb 'ta,' meaning to strike, and therefore to
allude to the method of performing the operation, and, if
this supposition be correct, it has a curious resemblance to the
English word tattooing, meaning a particular beat of the
drum.

From a passage in the book of Leviticus, chap. xix.
25, in which the Israelites are forbidden to make any
cuttings in their flesh, for to print any marks
upon their bodies, it has been supposed that some custom
resembling tattooing was practised in the time of Moses.
Was in the former note upon the practice of the
Israelites, there is a reason for the statement that
although tattooing seems to have been commonly re-
garded in England rather as a custom of savage islanders
than anything more, it is also an Oriental custom, and that
too among people whose proximity to the Hebrews affords
no reason for the inscription. This would account for
'the Bedouin Arabs, and those inhabitants of towns
who are in any way allied to them,' observes the author of
this note, 'are scarcely less fond of such decorations than
many islanders of the Pacific Ocean. This is particularly
the case among the females, who, in general, have their
legs and arms, their front from the neck to the waist, and
even their chins, lips, and other prominent parts of the
face marked with blue stains in the form of flowers,
of all sorts of animals. In varis fanciful figures. They
have no figures of living objects, such being forbidden by
their religion; neither do they associate any superstitions
with them, so far as we are able to ascertain. They prob-
ably did both before the Mohammedan era, as their de-
scendants do in the desert; for it is said that the Arabs
there generally go about without their jackets, and with
their sleeves tucked up above their elbows, and we scarcely
recollect ever to have seen an arm, thus bare, which was not
adorned with the said markings, or with some other
figure, or of some saint under whose immediate protection
the person thus marked conceived himself to be.' Thus also,
proceeds the author, 'persons who visit the holy sepulchre
and other sacred places in Palestine have commonly a
mark impressed upon them by the priests of Jerusalem
(Prepost. universorum). The works of antient writers contain
many notices of the practice of tattooing, as practised
by several barbarous races. As to the Britons, Cæsar
merely describes their custom of staining their bodies with
various colours, or with blue, and impressing their
faces with black circles, or coloured figures. Tacitus
speaks of the painting as consisting chiefly of the figures
of animals, that grew with the growth of the body. He-
rodian says they punctured their hands and the figures
of all sorts of animals. Invar is still more explicit. For,
spaking of the Picts, whose name he derives from their
coloured skins, he tells us that the painting was done by
squeezing out the juice of certain herbs upon the body,
without puncturing the skin, and this he calls a 'tatoa,' or
Tiatoa, or Tatoo. (History of England, vol. i., p. 129.) Cæsar supposed
that this practice was adopted for the purpose of terrifying
their enemies; but probably this kind of skin-painting
was the national dress, and if so, it may have existed in
the highest state of civilization at a time when Rome
had not even heard of the invasion of the Britons
by the Roman invasion. Tattooing may also have been practised
by our ancestors as a means of distinction, as well as
from the love of ornament. Thus Herodotus, who describes
the habits of the Thracians, says that to be tattooed or marked
(a brazon) was an emblem of rank, and the want of it indi-
cated meanness of descent (v. 6). The extended use of
clothing at a later period rendered such ornaments super-
fluous, and led to the decline and subsequent abandonment
of the practice, as has already been the case therefore, of
the tattooing of the natives of the south of England.
(Tatton's History of England.' that we hear no more of this tattooing in the south (of Britain) after it was subdued and civilised into a
Roman province, though it still continued among
the rude tribes of the north, whereas it is mentioned that it
was banished thence also by the full act of civilization.
In a subsequent part of the same volume (p. 329) it is
stated that the custom of tattooing, or puncturing the
skin, was practised by the Anglo-Saxons as well as by
the Britons, and that it was acknowledged as an
unnecessary, but nevertheless continued during the whole
of the Anglo-Saxon period, and is among the English
vices reprobated by William of Malmesbury after the Nor-
man conquest. Several other antient notices on the sub-
ject are collected by Mauclerc., his 'History of the
Celtic Tribes,' which work is cited in the volume on the
'New Zealanders' in the 'Library of Entertaining Knowl-
dge,' where much information respecting tattooing is
given.
In modern times, the custom of tattooing has been found in most of the islands of the Pacific Ocean, and among many of the aboriginal tribes of Africa and America, as well as, on a limited scale, as before stated, in the East. Much curious information on the various kinds of tattooing is collected in the volume on the ‘New Zealanders’, previously cited. From this work we commend the following account of the process of tattooing, as performed in New Zealand upon an English sailor, named John Rutherford, who was captured by the natives in 1816, and resided among them for nearly ten years, and upon some companions who were taken with him—The natives having seated themselves on the ground in a ring, the Englishmen were placed in the middle, stripped of their clothes, laid down on their backs, and held by five or six men each, while two others commenced the operation of tattooing. Having taken a piece of charcoal, and rubbed it upon a stone with a little water, so as to produce a thick liquid, they dipped it into an instrument made of bone, with a sharp edge like a chisel, and shaped in the fashion of a garden-hoe. They then applied the instrument to the skin, and struck it twice or thrice with a piece of wood, thereby making it cut into the flesh as a knife would have done, and causing a great deal of blood to flow, which they kept wiping off with the side of the hand, in order to see whether the impression was made sufficiently clear. If not, they recalculated the cutting-instrument again to the same place. Various instruments were however employed in the course of the operation, one sort being made of a shark's tooth, and another having a serrated edge; and they were used of different sizes, towards the different parts of the body. Rutherford states that the pain was most acute, and that, although the operators were very quick and dexterous, he was four hours under their hands; and he was completely blinded for a time by the operation. In three days the swelling occasioned by it had greatly subsided, and he began to recover his sight; but six weeks elapsed before he was completely well. Rutherford's account agrees with those of other observers, excepting in the circumstances of the whole operation being performed at once, while both Captain Cruise and Mr. Marsden state that it required several months, and sometimes several years, to complete the tattooing of a chief, owing to the necessity of allowing one part of the face or body to heal before commencing the decoration of another part; but, besides the probability that this might apply only to the more intricate patterns, or to cases in which the tattooing extended over a larger portion of the person than in the case of Rutherford, it is possible that the natives may have designed to put his powers of endurance to a severer test than would be required of a native. Captain Cruise states that the New Zealanders occasionally renew their tattooing, as the lines grow faint by lapse of time; and from various accounts it would appear that the tincture introduced into the wound (on the edge of the cutting-instrument) is sometimes obtained from the juice of a tree; and that, before the cutting is commenced, the intended figure is traced upon the skin with a burnt stick, or a piece of red earth. The age for performing the operation appears to vary from eight or ten years up to about twenty; and the females are not required to submit to anything beyond a slight tattooing of the face. Those among whom Rutherford lived had the inside of their lips tattooed, as well as having marks on the chin, forehead, and sides of the nose and mouth; while the men were commonly tattooed on the face, hips, and body, and some as low as the knee. The most complicated patterns are found upon chiefs of the highest order, and their peculiar devices, or, as they are called, amocos, form distinctions which, in some cases, take the place of the sign-manual of the individuals to whom they belong. An instance is related in the Missionary Register for 1816, in which a chief in the Bay of Islands, on making a grant or conveyance of a piece of land to some missionaries, had a drawing of the tattooing of his face affixed in lieu of a signature; while an attesting witness added, in like manner, a copy of the pattern on one of his cheeks. Of the character of these patterns, better ideas will be conveyed by the annexed bust of Shungie, copied from an engraving in the Missionary Register for 1816, than by the most lengthened description. After it is inscribed a copy of a drawing, executed by Tupai Cupa, a New Zealand chief, without the aid of a glass, of his own amoco, or tattooed pattern. This interesting individual also drew from memory, while in England, the amocos of his brother and of his eldest son; and such was the force of association in his mind, that, on finishing the latter, he held it up, gazed at it with a murmur of affectionate delight, kissed it repeatedly, and finally burst into tears.

The process of tattooing as practised, or rather as it was formerly practised, in other islands of the South Sea, was less painful than that followed in New Zealand: for, according to the account of Captain Cook, in some cases the punctures could hardly be said to draw blood. The instruments used were edged with small teeth, somewhat resembling those of a fine comb; and, as in the case of New Zealand, the colouring tincture was introduced at the same operation as that by which the skin was punctured; the substance employed in some places being of a kind of lamp-black. On the brown skins of the natives the marks made with this substance appear black; but on the skin of a European they are of a fine blue colour. Laffaran speaks of powdered charcoal as the colour-matter commonly used by the American Indians; and states that it was introduced by a process subsequent to that of cutting or puncturing the skin. This insertion of the colour appears to have been most painful part of the operation of tattooing as practised among them.
In addition to the other reasons which have been alluded to for the general adoption of the practice of tattooing among savage tribes, it is likely that it may be regarded as an important part of the initiation of a warrior, of whose powers it is said that it is a señal of the 'Thus' observes the author of the 'New Zealanders,' in the account which Rochefort, in his 'History of the Antilles' (p. 108), gives of the initiation of a warrior among the people of those islands, it is stated that the father of the warrior is presented to the company as one used to proceed to scourify (as he expresses it) his whole body with the tooth of the animal called the aoutoi; and then, in order to heal the gashes thus made, he rubbed in the blood of the animal, provoking pain to the poor patient; but it was indispensable that he should endure the whole, adds our author, without the least contortion of countenance or other evidence of suffering.'


TAUBMANN, FRIEDRICH, was born at Wounsel, near Baireuth, on the 16th of May, 1653, where his father was a tailor. His mother was a very simple, good-natured woman, who married a tailor, who wished to bring up his stepson Friedrich to his own business; but as the boy showed little inclination, he was sent, in 1777, to school at Calmberg, where his studies were chiefly devoting to reading and begging. In 1892 he went to the gymnasium of Heilbronn, where his Latin verses and the wit displayed in them were so much admired, that he was crowned by Paul Melissus as poet-laureate. Ten years later he went to the university, where he must thereupon have made an excellent figure, and, in 1595, was appointed professor of poetry and eloquence, to which afterwards the honour of court-poet was added. He died at Wittenberg, on the 24th of March, 1613.

Tauber was conscientious in the discharge of his official duties, and he was a witty and humoristous man. During his lifetime he had the reputation of being the greatest wit of the age, and persons of the highest rank sought his society. From all that can be learned about him it is clear that he did not, like many others in similar positions, forget his own dignity as a man: he never acted as a buffoon or flatterer, but always manifested a straightforward and upright character. In his time philosophy was sinking very rapidly in Saxony, all attention being absorbed by theological controversies and sophistries, and Tauber was one of the very few who, both in earnest and in jest, impressed upon his contemporaries the necessity of resuming a thorough study of the antient languages. He translated it into German in Augsburg in 1661, and subsequently gave it another translation, which was published shortly after his death, the form being somewhat altered by the editors. The first edition of his sermons appeared at Leipzig, 1498, in 4to, under the following title: 'Sermone solidorum gressa in graden erheblichen Doctora Johanne Domini Medientz praecepto, in lemnend den neuesten waren weck, yn geiste zu wandern durch uberschwebeden syn, unvoracht von geistes ynnige vorhendt. Ich deutschem manchen menschen zu seligkeit.'

This edition was followed by one at Augsburg, 1506, and a more complete one at Basel, 1521, in 4to. A translation of these sermons into the dialect of Lower Germany was published at Halberstadt, in 1623, fol., and another into High German by P. J. Spener, at Nürnberg, 1684, 4to; and a translation into Latin by Laurentius Pursel, Cologne, 1758, also 4to, which was reprinted at Mancera and Paris. There are also in Italian and three Dutch translations: the best of the Dutch translations is that of Antwerp, 1685, fol.

A list of the works of Tauber, together with the whole literature on the subject, is given in Jörden's Lexicon Deutscher Dichter und Prosisosen, vol. vi., p. 1-3.

TAUNTON, an ancient town in the south-western part of Somersetshire, situated in a fertile vale called Taunton vale, and distant some miles from London, 44 from Bristol, and 33 from Exeter. Roman coins and other antiquities have been found, from which it has been inferred that there was a Roman station here. Taunton was certainly a place of considerable importance during the period of the Roman occupation, as is shown by the mention of a temple to Jupiter, and in the eighth century a castle was built here by Ina, king of the West Saxons, in which he held his first great council. The building was destroyed by his queen in expelling one of the kings of the South Saxons. An ancient town, Taunton was the residence of the bishops of Winchester, to whom the town and manor were granted; and the present remains are believed to be those of a still more recent edifice. Perkin Warbeck held possession of the castle and town for a short time; and in the time of his long exile he was stayed by King Henry (afterwards Admiral) Blake, against 10,000 royalist troops, until relieved by Fairfax.

The town is about a mile long; the principal streets are...
wel pared, and lighted with gas; and the houses of brick, of respectable appearance. Apart from the main thoroughfares are some very poor streets, which, before the enlargement of the borough, were inhabited by persons desirous of profiting by the parliamentary franchise. The work begun by the Wesleyan was established at Taunton in the fourteenth century, but has long since decayed; and present the silk manufacture is carried on, though not to any great extent. The river Tone flows on the northwestern side of the town, and is crossed by a stone bridge of each end of the town. The river is only navigable above Taunton in 1811 a canal was projected between Taunton and Bridgewater, a distance of 12 miles. This canal is of great importance to the prosperity of the town and district, by enabling it to export agriculture and other produce for Bristol and other markets, from which it receives groceries, coal, and other commodities in return: there is a branch from this canal to Chard. In July, 1842, the railway from Bristol to Exeter was opened as far as Taunton, so that there is now a railway communication with theemporopalis.

markets, held twice a week, are very abundantly supplied with fish, fruit, and every kind of provisions. The market-house stands in a spacious open area called the Parade, and is a brick building of considerable size; the upper part contains offices, and a large hall and a lower part consists of an arcade on each side, in one of which the corn-market is held. On market-days the Parade, which is enclosed by iron posts and chains, is occupied by butcher's stalls. On the east side of the Parade there is a handsome building of the Ionic order, erected in 1821, the upper part of which is appropriated as a library, museum, and reading-room; and underneath, in the rear, are the markets for fish, poultry, dairy produce, &c. The old conventual library is a plain edifice which contains a good though not extensive library, and a large public reading and news room. The theatre is a small neat building. Two weekly newspapers are published at Taunton. There are three churches. The church of St. Mary Magdalen is spacious and very handsomely adorned with florid Gothic style. The quadrangular tower at the west end, 153 feet high, is much enriched, and is a work of great beauty. The value of the living, which is a vicarage, is not given in the Reports of the Ecclesiastical Commissioners. St. Jamman Church is a plain edifice, with an attain-tower formerly belonging to the conventual church of the priory. The living is a perpetual curacy, of the annual value of £200. Trinity Church was consecrated 15th June, 1842. It is in the Gothic style, built of white lias stone, by the late architect, and the pews are for one thousand persons. It stands on elevated ground, about half a mile from the parish church, in a poor and populous part of the town. There are two chapels belonging to the Wesleyan Methodists, both erected under the direction of Wesley. The Roman Catholics, Independents, Baptists, Quakers, and Unitarians have chapels. The free grammar-school was founded by Fox, bishop of Winchester, in 1522. The premises are situated within the castle-gate, and consist of a large and ancient school-room, and under the same roof is the dwelling-house of the master. The endowment is worth about £62 a year. The number of infant, Sunday, and daily schools at Taunton was stated in 1833 to be 170. Government and schools: The infant schools were opened in 1812; and there are other charitable schools.

Charles I. granted the Burgess a charter of incorporation. In the reign of Charles II. they were deprived of this charter, in consequence of the town having displayed much zeal for the parliament, but it was restored, and in 1792 became fortified by the corporate body having neglected to fill up vacancies. The town then came under the jurisdiction of the county magistrates, and became a municipal government. The bailiffs and constables, as the principal officers of the town, take a prominent part in all public proceedings. Taunton has returned members to parliament since 1253 (2 Henry 1.). Before the Reform Act the right of election was in the possession of six holds resident and not in the receipt of charitable relief. The town having outgrown the ancient limits of the borough, which was

wholly within the parish of St. Mary Magdalen, a new boundary was adopted, so as to comprise parts of the following parishes:—St. Mary Magdalen on the east, St. James on the north, Bishop's Hull on the west, and Wilton on the south. By this extension the population of the town was increased from 5,569 to 12,470 persons, or to the census of 1831. In 1826 the number of electors polled was 739; in 1840 the number on the register amounted to 1010, including 216 of the old potwallers. Two meetings were held each year; and Michaelmas quarter-sessions are held at Taunton. There is a court for debts under forty shillings, the jurisdiction of which extends over the hundred. There is no prison, except a lock-up or place of temporary confinement. To the southern part of the town the regular quadrangular consisting of the remains of the castle.

(Toulmin's History of Taunton, 1791; a new edition by Savage, 1822.)

TAUNUS, [GERMANY.] TAURUS, L. [TERRILLI.]

T A U R I C A C H E R S O N E S U S was the ancient name of the peninsula which juts out southwards from European Sarmatia, between the Pontus Euxinus (Black Sea) and the Palus Maeotis (Sea of Azov); it is now called Cretan, a term applied to the region of the Euxine by its inhabitants, who compare it to the promontory of Sunium (in its form, size, and physical features) described under CRIMEA. The isthmus which connects it and the Greek mainland was called the Taphylas, the Tepopo, and there appears to have been a town of the same name upon the isthmus.

Pliny, iv. p. 326. Mela, i. 1.) On the west of this isthmus was the Sinus Carinates (Kéazké K¿pamGw, now the Gulf of Yevpatoria), and an isthmus, known as the island of the island was called Coras (K§ Xsri®). On the east the peninsula is divided from the coast of Asia by the Cimmerian Bosporus ( Króupa ), now the Strait of Kertch or Yeiskale. On the south-western side of the peninsula is a small peninsula terminated by Cape Khersonese, and enclosed on the north by the Gulf of Achiarn, the ancient portus Chersoninis, which was the ancient Portus Symbolorum (J^oM x?;ro®). On the peninsula, at the distance of 100 stadia from the promontory Parthenion (Strabo), stood the city of Chersonesus (KépamGw), now the city of Tauris, the ancient Chersonesus Siracalete. It was a colony of Heraclea in Pontus. The peninsula itself was called the Sea Chersonese, and the Chersonesus Taurica was sometimes called the Great Chersonesos, to distinguish it from the part of itself. The other important towns were, on the isthmus, Taphylas (the Tepopo), now Perekop; on the red coast Eupatoria (Boranías, now Eupatoria or Kéte built by Mithridates Eupator; on the east coast Theodosia (Kédóxia, now Kéte Eupatoria or Kéte built by Mithridates Eupator; on the east coast Theodosia (Kédóxia, now Kéte Eupatoria or Kéte built by Mithridates Eupator; on the east coast Thermostos (Thermostos, now Kéte or Penk, of the Cimmerian Bosporus, the colony of the Milites; at the eastern end of the island was Chersonesus Thermostos, now Kertch. There were several towns in the interior, of which the only one worth mentioning is Semionovo. - Ekkalos, the name of Ekkalos, is Old Krimin.
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the Tauri, from whom the Chersonesus was called Taurica, and whose name remains in that of the modern Russian province of Taurida, in which the Crimea is included. Who these Tauri were is a question of some difficulty. Strabo (p. 308) calls them a Scythian people, but Herodotus (iv. 99) clearly distinguishes the Tauri from the Scythians, as being a different nation. The inhabitants of the whole or a part of the peninsula are not unfrequently called Scythotauri or Tauroscythea. Judging from this mixed name, from the testimony of Herodotus to the two facts that the Tauri were a different people from the Scythians, and that they were not Cimmerians from the peninsula, and, lastly, from several analogous cases, it seems most probable that the Tauri were a remnant of the old Cimmerian inhabitants, who had sustained themselves in the mountains against the Scythian conquerors. The name of Tauri, however, is derived from an old root Tau, meaning mountain. The Tauri were reputed by the Greeks to be inhospitable and cruel to strangers: they were said to offer human sacrifices, especially of shipwrecked mariners. A minor goddess, whom, according to Herodotus, the Tauri themselves identified with Iphigenia, the daughter of Agamemnon, and whose temple stood on the promontory of Phulphion. (Herodot., iv. 103; Strabo, p. 308; Meis, a. D. 218; Pausanias, vi. 1. 6; and Athenaeus, ii. 126b.)

Further information respecting the geography and history of the peninsula and of the adjoining delta of the Kuban is given under CRIMEA and TAMAN.

TAURIDA, one of the governments of South Russia, was created by a new act, stipulated on the Black Sea; consists of—1st, the Crimea or Tauric Peninsula; 2nd, the Negro Steppe, with the island of Taman (TAMAN); 3rd, the country of the Tschernomorsk Cosacks. It is bounded on the north-west by Kherson, on the north-east by the country of the Don Cosacks, on the east by Caucasus, on the south-east by the Kuban, and on the south by the Black Sea. The Crimea and all its principal towns are described under the respective heads. [BARYCHALAI; CRIMEA; KAPPAD; SEHAS; THESPA; TEBE; TIRYN; TURK.] The country is a quarter of a million of square miles, with 520,000 inhabitants of many different nations, Tartars, Cosacks, Russians, Jews, Gypsies, Germans, and other foreign colonists, &c. It lies between 44° and 47° 30' north latitude, and 29° and 37° east longitude. The Negro Steppe includes the whole of the extensive country from the Dnieper and its limans to the Buda. It is a dry elevated steppe on a granite base. The country has precisely the character of a Russian steppe: the soil is dry, poor, in part sandy, and saltish, without wood; but there are here and there extensive holmwoods with rich black mould, which produce the finest grass. The climate is extremely mild, and differs little from the peninsula. The winter, though short, is severe. The only rivers are those which form the boundaries: the Dnieper on the north-west, the Konski Wodd on the north, and the Buda on the east. The south-east is on the Sea of Azof, and on the west the Black Sea.

The land of the Tschernomorsk Cosacks including the island or peninsula of Taurida, is bounded on the north by the country of the Don Cosacks, on the east by Caucasian, on the south by the river Kuban, and on the west by the Sea of Azof, and is separated from the Crimea by a narrow pass a few miles wide. The Janyk, a branch of the Azof with the Euxine. The coast is sandy, flat, and forms some considerable bays or inlets, called by the Russians ladas, the most considerable of which is the Beagarko, nearly in the middle of the country. It is an immense plain, with a few hills in the south, belonging to the Caucasian system, consisting in general of very fertile lowlands, which are well adapted for agriculture, but for the most part used as pasture for cattle; the remainder consists of a poor saline soil; and there are some small lakes with salt water: the climate is very mild. The principal rivers are the Kuban, on the south, which separates it from Circassia, and discharges itself on the south of Taman by a very broad channel, and the legs of which is, on the north side of the Don Cosacks, which is joined by several small streams, and empties itself by a considerable liman into the Sea of Azof. The small streams in the interior fall into the Sevastopol, which, the Beagarko, forms at its mouth the liman Beagarko.

The countries forming the government of Taurida were inhabited in ancient times by the Scythians and by Greek colonists. Since the time of Herodotus, in the fifth century B.C., they have been successively conquered and ravaged by many different nations. They have been subject to the kings of the Bosporus, the Romans, the Sarmatians, then to the Greek emperors, and at the end of the twelfth century partly to the Genoese; they were conquered in the thirteenth century by the Tartars, and at the end of the fifteenth by the Turks. Mohammed II. made himself master of Taurida in 1475, and expelled the Genoese and the Venetians, the former of whom possessed the island of Taman; the latter had the colony of Tana. Subsequently to 1698 the Russian armies in 1774, at the peace of Kutschuk-Kainardji, to recognise the Crimea as an independent country, to be governed by a khan chosen by the nation, and to recognise the sultan as their head in religious matters only. The Khan Saben I., whose election had been supported by the Russians, being pressed by the Turkish party, was at length induced to seek refuge in St. Petersburg. Russia now declared the Crimea to be her property, and the Porte, to secure her title, sent a strongly armed fleet, under the command of General Shirley, to the Crimea in 1784. The khan received a pension from Russia, and in the sequel retired to Turkey, but in 1787 was beheaded in the Isle of Rhodes by the sultan's order. Sultan Falli Ghierai is his lineal descendant, who lives (or at least did live some years ago) in Simferopol, is a Christian, and is married to a Scotchwoman. The Crimea and the provinces dependent on it were formed into a government in 1784, by the name of Taurida, and incorporated with the Russian empire. The empress Catherine II. added to the material titles that of the 'Crown of the Taurida,' which was conferred on Prince Potemkin, who had been instrumental in bringing about, not without violence, the submission of the Tartar inhabitants, the surname of the Tauri. The Porte in 1776 appointed a new khan tamer, and demanded that the Crimean should be placed on the footing stipulated in the last peace; but it was obliged to cede it for ever to Russia in the peace of 1792. Taurida was at first a province of the government of Ekaterinoslav; in 1797 it was incorporated with the government of New Russia; and in 1802 it was made a distinct government by the emperor Alexander.

Among the numerous authorities that might be quoted, besides those already cited under the heads of the CRIMEA, ODERSYA, &c., we may mention Muravev Apodor, 'Reise durch Turrien,' 1820; Eichwald, 'Alte Geographie des Kaspischen Meeres des Kaukasus, und des südlichen Russlandes,' 1838; and for the Negro-Tartars, Daniel Schlatter, of St. Gallen, 'Bruehstucke aus eigenen Reisen nach dem südlichen Russland in den Jahren 1822-1828.'

TAURINE, a peculiar crystallizable substance contained in the bile. Its properties are, that it has the form of a six-sided prism terminated by pyramids of four faces; the crystals, when first separated, have a sharpish taste, which is neither sweet nor saline; they undergo no alteration by exposure to the air even at 212°, and have neither an acid nor an alkaline reaction. When heated in the naked fire, this substance is converted into brown, fuses into a white silicate, exalts a sweet empirical odour resembling that of burning indigo, and leaves a charcoal, which is readily burnt: when submitted to dry distillation, it yields much thick brown oil, and a little yellow acidulous water, which holds...
an ammoniacal salt in solution, and reddens a solution of perchoride of iron; one part requires 154 parts of water at 85° for solution; it is much more soluble in boiling water, and the excess crystallizes on cooling; it is but little soluble even in hot or boiling water, and is nearly insoluble in absolute alcohol. Concentrated sulphuric acid dissolves and forms a light brown solution with taurine; nitric acid readily dissolves it, and when the acid is evaporated, it is left unaltered.

TAURUS

TAUROMÉNIUM, now TAORMINA, a town in the northern part of the east coast of Sicily. The antient name, Tauromenium (Ταυρομένιον), like that of the river Taurus, is derived from Taurus, the antient Alcathous, of which the town was situated, was derived from Mount Taurus, on which the town was built. Diodorus Siculus gives two apparently contradictory accounts of its foundation, though both agree in the main point, that Tauromenium was founded by the inhabitants of the antient town of Naxos, which lay a few miles south of Tauromenium. In one passage (xiv. 50) he states that during the war of Dionysius the Tyrant with Himileo, the latter induced the Siculi who had previously resided from Dionysius the town of Naxos and its territory, to occupy Mount Taurus, and to fortify themselves there; and after the termination of the war in favour of the Carthaginians, the Siculi, about 392 B.C., formed a permanent settlement on Mount Taurus, which they called Tauromenium. The other account (Diod. Sic. xvi. 7) places the building of the town somewhat later, inasmuch as it states that it was founded by Andromachus, the father of Timaeus the historian, in conjunction with the inhabitants of Naxos, under the name of Tauromenium. The town which Andromachus himself is called Tauromenium, which implies the previous existence of Tauromenium. Consequently Diodorus can only have meant to say that Andromachus and a portion of the inhabitants of Naxos built an existing town of Tauromenium, and that he agreed with them in the name of Tauromenium being preserved.

(Swessing ad Diodor. Sic. vol. vi. p. 532, ed. Bippont.) Strabo (vi. p. 27, ed. Tauchnitz) calls Tauromenium a colony of the Zancleans of Hybla. Soon after its foundation the new town appears to have become very wealthy and powerful. Agathocles, the tyrant of Syracuse, put to death a great number of the inhabitants who had opposed his usurpation. (Diodor. Sic. xix. 102.) In the time of Pyrrhus the town was occupied by a tyrant, Tanytarp, who supported himself on the aid of the Roman statesman and who sold the king on his landing in Sicily. After the subjugation of Sicily by the Romans, Tauromenium became a civitas foederata, and being thus under the protection of Rome, it enjoyed a peaceful existence, during which its prosperity increased. (Ciceron. In Verrem. ii. 66.) In the time of Verres the town contained many statues of this proprietor, all of which, after his departure, were destroyed, except the pedestal of one which was placed on the market-place, in order to mark the disgrace of the Roman governor. In the war of Carcass with Pompey, Tauromenium was in the possession of the Pompeian party; but when Cassar made himself master of it, he expelled the inhabitants, and established a Roman colony there. (Appian. De Rei Civilt. p. 105, 106, 109; Pliny, Hist. Nat. iii. 14; Velleius Patric. ii. 78.)

Taormina at present contains about 6000 inhabitants; it is built on a steep rock on the sea-coast is its situation. It contains considerable ruins of antient buildings, especially a theatre of gigantic dimensions, the seats of which are cut in the rock, which projects into the sea. This theatre and the aqueduct, or, as it is generally called, a naumachia, of which there are remains, were not constructed till the time of the empire. On the hills which rise above Taormina there are ruins of several castles, and among them one is very remarkable, which is called Mola, and was built in the ninth century of our era by the Siculi, and which was afterward a fortress and a strong resistance by the inhabitants.

The principal deity worshipped by the antient Tauromenians was Apollo, who confirms the statement that the god himself resided in the town, among the Apollo was the national divinity. An Apollo, with a wreath of laurel round his head, occurs on many coins found at Tauromenium, with the inscription ΑΡΧΑΙΩΤΑΣ, or ΑΡΧΑΙΤΑΣ; and the reverse shows a tripod, which probably indicates that Naxos was founded under the sanction of the Delphic god. Other coins show the head of Dionysus, or the head of Athene, and sometimes a which represents a head of Jupiter, and the other an eagle with the thunderbolts. The name of the town is expressed on the coins by Ταυρο, Ταυρος, Ταυρομενας, or Ταυρομεναν. (Eckhel, Doctrina Num., i. part i. 327, 328.; Mommsen, i. p. 321, 322.; Suppl. vii. 1. p. 642.)

TAURUS, MOUNT (τ Σταυρος), in the opinion of the later Greek geographers, was a great chain of mountains which extended nearly due east and west from the shores of the Caspian Sea to the Euphrates, and divided Asia into two parts, Asia within the Taurus (Ἰερος το Σταυρος), and Asia without the Taurus (τεταρτος το Σταυρος). Their notions respecting this chain were so confused, and indeed only a small part of it ever really bore the name.

The chain of Taurus, properly so called, commences at the south-western point of Asia Minor, and proceeding eastward parallel and near to the Mediterranean, it encircles itself and the mountain mass, which formed Paunphylia and Cilicia. At the river Iyamus the chain divides into two, that of Mannas, which proceeds to the east, dividing Syria from Asia Minor [Mannus], and the continuation of Taurus, which was more or less a ridge called the Taurus longus, which extends across the Euphrates into the northern part of Armenia, where it joins Mount Masius. This chain now bears the name of Enamas, Ramandan, and Gourin.

In Cappadocia the Taurus throws off a great branch or range, which extends from the north to the south-west of Asia Minor to Arrat bears the name of Taurus. The name itself is probably merely a form of a root which occurs in several Oriental languages, meaning mountain.

(Rennell's Geography of Herodotus, i. 226, 227.; Scholz's Alte Geographie.) [ANATOLIA.]

TAURUS (the Bull), the second constellation of the Zodiac. Its position in the heavens, surrounded by Aries, Orion, and Pegasus, is easily marked by the manner in which its bright star Aldebaran is connected with the belt of Orion. In all specifications upon the zodiac, Taurus must be an important object of consideration. Taurus is an easy, reliable, and distinct sign which predilection can consider it advisable to begin from. Aldebaran must have been at no great distance from the vernal equinox. Referring this point however to the article on the zodiac, we shall merely notice that the Greeks, as well as the Romans, had an explanation of the striking constellation; the fables of Europa and Theseus are the only ones alluded to in statements of its mythological meaning.

The figure is only a part of a bull, the head, shoulders, and fore legs. Aldebaran and the Hyades form the forehead, and eye, and the Pleiades are in the shoulder. But Antares must have drawn the figure differently, for he puts the Pleiades in the knees.

The Pleiades are a large group of stars whose magnitudes, of which five (some of the antients said seven) are distinctly visible to the naked eye, α, β, γ, δ, and ε of the constellation; there are many more in the cluster. These stars are arranged in the form of a V, and a being the extremes, and γ at the angular point. The star α is Aldebaran. The naked stars to the right may be possible that they were right in their idea of the Greek word; the large star and the cluster of small ones might very easily suggest the notion of a bow and her bow.
TAURUS PONIATOWSKI, a constellation formed by
the Abbé Pozobut, a Polish astronomer; born in 1729: we
do not know the year of his death; but Lalande mentions
his having resumed his observations at Wilna in 1802, in

3 Tauri of Flamsteed has its only existence in a mistaken entry; and
4. 210, and 130 the same.
5 Mr. Herschel says this star is lost; and M. Lalande says that it is not.
6. It is however still in its place. Probably it is a variable star.

honour of the reigning king of Poland, and adopted in the
French (Fortin's) edition of Flamsteed's maps (or rather
plates). In 1728, proposed this
collection to the French and other academies, by whom
it was received. Bode conjectures that a resemblance of
certain very small stars in it to the figure of the Hyades
was the reason for the first word of the name. It is situated
between Aquila and Ophiuchus, and the Astronomical
Society's Catalogue mentions one star of it, of the sixth
magnitude, being 2070 of that catalogue, and (328) of
Piazzi.

TAUSSAN, TAUSSEN, or TAGESEN, JOHN, the first
Danish theologian who made his countrymen acquainted
with the principles of the Lutheran reformation. He was
born in 1494, at Birkinde, a village in the island of Fünen.
After he had received his early education in the convent
of Antworskow, he wished to continue his studies at
the university, and the abbot of the convent fixed upon Co-
logne. Here he became accidentally acquainted with
some of the earliest works of Luther, which excited in
him such a desire to study under the reformer, that he
defied the opposition of his superiors, and went to Witten-
berg. After having spent some time here he went to
Rostock, where he took his degree of M.A., and thence
proceeded to Copenhagen, to undertake the office of
preacher in one of the public schools, 1521. This spec-
ial fancy however did not satisfy him: his wish was to
proclaim the new doctrines, which he thought he could do
more effectually if he withdrew to his former convent of
Antworskow. Here he gained great reputation as a
preacher, and at first endeavoured privately to make his
brother monks acquainted with the reformed doctrines;
but in 1524, on the occasion of the abbot being absent,
Tausan delivered a sermon, which produced such an effect
on his hearers, that most of the monks declared themselves
ready to abandon their old belief. The excitement and
disturbance arising from such proceedings led to Tausan
being transferred to another convent at Wiborg, where
however he persevered in his exertions, and again gained
a considerable number of followers. King Frederick
of Denmark, who was favourably disposed towards the
doctrines of the German reformers, and wished to favour
Tausan, sent him, in 1526, a letter of protection, gave him
the title of court preacher, and assigned to him a church
at Wiborg, where he might preach without molestation.
The bishop of this place opposed him in everything; but
his attempts were fruitless, as Tausan was supported by
the sympathy of the people. The disputes between
the two religious parties now became more vehement
every day; and at last the king, in order to save Tausan, invited
him, in 1529, to Copenhagen, where he was appointed
preacher to the church of St. Nicolas. The reformation
in Denmark, the seeds of which had thus been sown, made
great and steady progress; and in order to settle the
question permanently, the king issued a command that
deputies of the Roman Catholics and Protestants should
appear on the 8th of September, 1530, before the assembly
of the states, and explain their creeds and points of dispute.
Tausan and the principal men of his party were present,
and it was finally settled that the Protestants should
preach and propagate their doctrines. The tranquillity
thus restored was interrupted by the king's death in
1533, when the Roman Catholic party, and more espe-
cially the bishop of Roeskilde, again began to trouble
Tausan, who was on the point of being driven out of his
country. For a time he absented himself from Copen-
hagen; but Protestantism in the meanwhile made such
progress, that the opposition to it in a short time either
ceased or became very weak. In 1537, in which year
John Bugenhagen was sent by Luther to Denmark to assist
in arranging the ecclesiastical affairs of the country, Tausan
was appointed preacher at Roeskilde and lecturer on theology at
Roeskilde; and four years later he was made bishop of Ripen,
a place which he held until his death, on the 9th of No-

dember, 1561.

Tausan wrote a considerable number of theological
works in Danish; some of them are controversial, others
exegetical, and a third class consists of translations of
portions of the Scripture and of original hymns. His works,
as well as the history of his life, show that he was a simple
and straightforward man; but in talent he was far inferior
to the great reformers who were his contemporaries.

(L. Holberg, Dämmernerskische, Norwegische Staete-
Vol. XXIV-P)
and Betch-Historic, p. 129, Scc.; compare Jocher, All- 
gem, Griebien-Lexiz., iv. p. 1630, Scc.)
TAUPE, the name of a Frenchman, who settled in the 
16th century, and his tastes and habits were those of a 
younger ruffian of his age. A naturally frank and 
frankly somewhat boisterous temper had done much 
neutralize the worst impressions of the law school in 
which he had been educated.

After such prelude by training, and with a character 
thus far developed, Tavernier commenced his travels 
the East. He had already been turning his eyes in 
this direction, and making interest to be received into 
suit of a new ambassador the emperor was about to 
send to the grand seigneur, one of the chief of Richelieu, Father Joseph, who had known him, had pro 
posed that he should accompany two young French 
noblemen who were travelling to Palestine by way 
Constantinople. Tavernier closed with the offer, and 
accompanied them. He returned to Turkey with the 
winter of 1630-31. A recent biographer has stated 
that he began his first journey in 1630: the origin of 
the project is as apparent as it is a mistake. Tavernier 
endeavored to enter the service of the grand 
coronation of Ferdinand III. was crowned king of the Romans 
December 1636. Tavernier gives no dates in the 
account of his first journey; but we know that he embarked 
Marseilles for his second in September, 1638, and we 
know that he had men to look after, for for his 
voyage on the day of Easter. He had remained several 
months at Constantinople waiting for a couple of weeks by a severe attack of sickness at Aleppo, 
if we assume he set out from Regensburg in December 
1638. As it is possible that Tavernier's first journey was 
then that of the Emperor Ferdinand, or one of the 
Romans. But a strong effort was made by the 
patriarch to have him crowned at the close of the 
decade at Regensburg in 1630; and Tavernier, writing from 
Scanderoon, and the voyage from Scanderoon to 
It is impossible that Tavernier's first journey could 
have been subsequent to the coronation of Ferdinand III., as his activities he witnessed at that time were in honor 
coronation which was expected to take place, but the 
Two passages in his Travels seem to place it beyond 
doubt that the visit to Regensburg had to be 
announced in Marseilles before the Paris edition of 1670 the expression occurs 
1632 on the road from Isphahan to Bagdad. He carried 
that road twice, and that was on his return from 
first expedition into Persia. It would be unsafe, 
upon the evidence of a Bresle in a book not very 
reliable, as above mentioned, to account for the story of 
the departure of Bagdad. This can only refer to 
the journey above. The account there about the end of April, 1632.
This date being ascertained, the chronology of the 
travels of Tavernier's life may be given in 
its travels with tolerable accuracy. He began 
by journey to the East from Regensburg, in December 
1638, penetrating by way of Constantinople and Tabriz 
and, and returned by Bagdad and Aleppo to Europe 
the summer of 1639. From this date till the 
remittance of his second voyage his history would 
comprise the following: He thence returned to 
the city of Euphrates and Tabrizz, and was appointed comptroller in the 
d'Orléans, who gave him leave 
to journey to the East. On the 13th 
Scanderoon, proceeded by way of Aleppo 
Desert west of the Euphrates to Baarah. The 
barked in a vessel sailing to Ormuz, and 
Bushire, proceeded through Shiraz to Isphahan. A 
stay in that capital, he travelled by Shiraz and
TAV

Gumbroo, where he embarked for Surat. He visited Agra on this occasion; but here again we are at a loss for dates to enable us to know just when he passed through Burnhamcore on his return. He reached Agra to Surat in 1641; that he visited Goa and returned to Surat by land about the end of that year; and that he was at Ahmedabad, either going or returning from Agra, in 1640. That he had the same journey two or three times, since he says that 'for six journeys which I have made between Paris and Isphahan, I have made twice as many from Isphahan to Agra and other parts of the Great Mogul's dominions. He was at Isphahan towards the close of the year 1650. He left Persia for France on his third voyage with him the brother already alluded to, and left Paris on the 6th of December, 1653. This time, after visiting Isphahan as usual, he disembarked at Gombroon for India. In January, 1655, he left Surat on an excursion to the diamond-mines near Golconda. In January, 1648, he made a voyage by sea to Goa; and in April of the same year he embarked at Mangalore for Balatia; whence he returned to Europe in the Dutch fleet in 1649. Tavernier's fourth journey occupied him from the 18th of June, 1651, when he set out from Paris, till 1655. On this occasion he proceeded from Paris to Massalipatan, in May, 1652; he revisited the diamond-mines near Golconda in 1653, and in 1654 he travelled to Travancore. After two months there, he took the route of YEzd to Isphahan, and returned to Europe by Smyrna. His fifth journey was begun in February, 1656. He was at Agra in 1658, but we are at a loss to date his sixth journey. He returned to France in 1658, proving his assertion that Tavernier made the East to be begun in November, 1663, and was terminated in 1669. The most important novelty of this journey was his tour through the province of Bengal as far as Dacca, which occupied him from November, 1663, till July or August, 1666. He was at Isphahan in July, 1667, and on his return to Europe visited Constantinople for the second time.

The very unsatisfactory arrangement adopted in the narrative of Tavernier's journeys has rendered it advisable to extract and arrange the genuine facts and observations which he has preserved, and to supply to them such information and consideration as may be necessary to an understanding of them. His first publication was an account of the mines in the seraglio at Constantinople (Nouvelle Relation de l'Intérieur du Serrail), published at Paris, in a thick quarto volume, in 1675. This was followed by an account of his travels (Six Voyages en Turquie, en Perse, et aux Indes), at Paris, in two quarto volumes, in 1676. A third volume was added in 1679, containing an account of the origin and the origin of the persecution of the Christians, the rites observed in their religious ceremonies, the fall of the empire from the king and the French company of the East Indies; observations on the commerce of the East Indies; account of the kingdom of Persia; account of the court of the Dutch in Asia, a published account of the Seraglio, the presents of the sultans of his Travels, Tavernier employed Chappuzeau, a dull and unintelligent writer: the memoirs contained in a third volume were prepared by Lachapelle, secretary to the president Lathamario. The account of the seraglio, and the contents of the third volume of the travels, are only memoirs compiled from the information of others, and partly more full exhibitions of topics touched upon in a narrative. It is to the first two volumes of Tavernier's travels that we must look for such information of the countries he visited, the time he spent in them, and the decisions he encountered, as is necessary to enable us to determine what he witnessed himself, what he learned by the report of others, how far his informants were worthy of belief, and how far he was qualified to understand their communications. But the arrangement of these two volumes is the worst that could be contrived for supplying satisfactory information upon these subjects. It is a system of digressions, from which it is impossible for a reader to follow the thread of events, which take place in various routes by which the Persian traveller can approach Constantinople, Isphahan, and the Persian Gulf. It changed as a rouleur; the result of all Tavernier's observations on the subjects of art and science is derived from incidental remarks that we learn when and in what order he travelled it. His remarks upon the political, military, and commercial state of the different countries are thrown into intercalary chapters. A similar arrangement is adopted in his second volume, which contains the fruits of his observations in the south of India, in the region between Surat and Delhi, in Bengal, and in the Dutch possessions in the Eastern Archipelago. The work is not only a systematic account of the geography and states of the countries which he travelled, nor is it a personal narrative of the traveller. It is a well-digested and unsatisfactory attempt to combine both.

Yet are the four volumes we have mentioned full of valuable matters, both for the historian and the geographer. The former is enabled to find in them the forty years' experience and observation of a European merchant in Turkey, Persia, India, and the Indian Archipelago, in the seventeenth century. Tavernier did not possess either the superior intellect or the resources of Thévenot and Bernier, but his opportunities of observation were more protracted. He was a part of that commercial enterprise and rivalry of which they were only spectators. He is himself a specimen of the kind of adventurers who at that time managed the commerce of Europe with the East. His unconscious revelations of his own character may be relied upon, and the naivété with which they are made encourages us to believe what he tells us of others. His statements have not been unchallenged: they wounded the national pride of the Dutch too sore to be left without a reply, and the partisan feelings of the Protestant liten of Europe induced them to embrace the cause of Holland, in opposition to the protége of Louis XIV. Even the Protestant minister who frankly confessed that he saw nothing interesting in or valuable of the plain of Troy or the ruins of Persepolis. And yet notwithstanding the violent attacks of the Dutch and Cal- lais, the silence of others, and even of himself (for Tavernier did not engage in any other material assertion he has been disproved. Unfriendly criticism has been confined to the remark that many of his statements regarding the Dutch are trivial, and betray a littleness of mind; this may be, but they are not the less characteristic for that reason. Tavernier's accounts of the principal objects of Oriental commerce in his day, of the leading markets and routes of trade, of the money of the different countries, and the state of the exchanges, are more full and intelligible than those we find in any other contemporary writer. His success in trade affords a guarantee of the correctness of the opinions he states. We have collated his routes, whenever this was possible, with those of recent travellers, and have found them in general so accurate, that they may be relied upon for the purposes of comparative geography, and in one or two instances as affording information regarding tracts which have not been visited since his time. Tavernier's notices of the politics of Constantinople, and of the transactions of the provinces to the north of Erivan, leave a favourable impression of his talent for extracting information from the native authorities. He has been accused of plagiarism, principally because of the striking coincidence between his account of the Goths of the Gherc, and the account of the Gherc, which Louis MoretI published in 1671 from the papers of Father Gabriel de Chillon. It deserves to be noticed that MoretI's publication is loudly arranged and neatly expressed, while the account contained in Tavernier's travels is confused and miserable in point of direction. Had it been taken from MoretI, it is scarcely possible that the latter could have been so wretchedly composed. Add to this that the information found in the papers of Father Gabriel is not said to have been the fruit of long residence in Persia, but that Tavernier resided three months among the Guerres at Kirman, and had frequent dealings with them in India and elsewhere; that he and Father Gabriel repeatedly met in Persia; and it must be allowed that the priest is quite as likely to have derived his information from the merchant as otherwise. In judging of the statements made by Tavernier, the school in which he was trained, and his personal character as it appears from his own narrative, must always be borne in mind. He was a man of taste for science and literature, for art, or antiquarian research. He acted upon impulse, and his instincts were love of travelling, and desire to acquire money for the support of his family. A diamond was a more interesting object to him than the mysterious remains of Tchelminar. He had no very fine or refined sense of honour, but he was frank and veracious, and little inclined to deck himself with stolen feathers of literature; possibly because he could not appreciate their value.

P 2
In this review we have been obliged to anticipate that part of the history of the third period of Tavernier's life, which relates to what may be called his literary labours. We are thus enabled to abridge the sequel of our narrative. The return of the embassy journey has now been presented with letters de noblesse, by Louis XIV., and purchased about the same time the barony of Aubonne in the Pays de Vaud. When his travels were published, they were, as has been intimated, attacked probably attacked; particularly, most forcibly, by Jurieu, in his 'Esprit de M. Arnauld' (December, 1664); more temperately and with a greater parade of evidence by Henrick van Quellenburg, in 'Vindicatia Batavica' (Amsterdam, 1684). Tavernier says that Bayle has given a characteristic account of his conduct relative to the publication of Jurieu, which was rather a libel than a criticism. He made a noise in the taverns and streets, he threatened and even named the day and hour when he would apply to the loon consentory of Rotterdam to demand execution of the canonical laws against the minister who had dishonoured him; but his threatenings came to nothing, he retired very peaceably, and never commenced any persecution at all.

The misconduct of a nephew, to whom he had intrusted the management of his affairs in the Levant, obliged him to sell, some time previous to 1688, his hotel in Paris and his estate of Aubonne. He retired first into Switzerland, and subsequently to Berlin, where he was nominated by the council of a director of a projected East India Company. From the time of his first journey he had regretted being prevented from carrying into execution a design which he then entertained of returning from Persia through the dominions of the Tsar of Russia, and new apprehensions afforded him an excuse and opportunity for making that journey, and he set out to travel to the East Indies across Russia in 1688. He was taken ill at Moscow, and died there in the month of July, 1689. The equivocal conclusion of Bologne's inscription on Tavernier's portrait contains a fair enough estimate of his character:

"En tous lieux sa vertu fut son plus sain appui;\nEt bien qu'en nos climats de retour aujourd'hui\nIl ne puisse."

Les plus sain traits que le moile enfante;\nM' a bien rapporté de son cure que lui.

(The six Voyages de Jean Baptiste Tavernier, Ecyur Beyzar d'Aubonne, en Turquie, en Perse, et aux Indes, à Paris, 1676-9, 4to.; L'Esprit de M. Arnauld, tiré des écrits de lui et de ses disciples, Deventer, 1684, 12mo. Henrick van Quellenburg's Vindicatia Batavica, oft Reputatie van het Tractaat van J. B. Tavernier, Chevalier, Baron d'Aubonne, Amsterdam, 1684, 4to.; Bayle, v. Tavernier; Bayle, v. Universelle, v. 'Tavernier, Jean Baptiste,' by Weiss.)

TAVISTOCK, a parliamentary borough and market-town, on the south-western border of Devonshire, 307 miles from London, and 34 from Plymouth, is a parish which extends between the western extremity of Dartmoor and the river Tamar, and, according to a survey made in 1781, comprises 13,987 acres, or nearly 22 square miles; but it is probable that this survey included lands within the boundary of the borough which are not in the parish: in the census of 1831 the area of the parish is stated to be 11,600 acres. The surface of the parish is diversified by hills from 300 to 600 feet in height, which rise in continued successions separated by valleys; often deep and narrow, the general direction of which is from north-east to south-west. The higher ground towards Dartmoor is of granitic formation, and the neighbourhood of the town consists of schistose rock. The town is situated nearly in the centre of the parish, on the northeast bank of the Tavy, which here flows rapidly through a narrow valley, from which the ground rises steeply on both sides to the height of several hundred feet. The river is crossed by two bridges, one new, and one old, from the valley of the Tavy is also covered by houses. The climate is variable, and the average quantity of rain falling in the year is 45 inches.

In 961 an abbey was founded at Tavistock, which was burnt by the Danes, and afterwards rebuilt on a larger scale by Hincmar, (1100-1135), on a weekly market and a fair. In 1513 the thirty-fifth abbot was called to the House of Peers, but in 1539 his successor surrendered to the king, when the revenue of the abbey was estimated at 902/. A printing-press was established in the abbey soon after the introduction of the art into England. Fragments of the abbey still remain but are chiefly incorporated with other buildings; and the rector is used as an assembly-room. John, Lord Russell, ancestor of the Duke of Bedford, held a grant of the abbey in 1377. An ancient louse-house once stood on the side of the workhouse. The parish church is a spacious edifice, with a tower at the west end supported on arches. The interior consists of four aisles and a chancel, and contains some tombs, some of which are ancient, and are preserved as a monument to the family of the Vavasours. In the year 1833 it was attended by 135 boys and 88 girls. At the same period seventeen one schools were attended by 283 boys and 224 girls: there were five Sunday-schools, in which 381 boys and 333 girls were instructed. There are two almshouses, one for poor widows, who each receive 2s. a year: and another for fifteen persons, nominated by the Duke of Bedford, who receive 3s. 6d. a year. A sum of 150 is applicable to the apprenticing of poor children.

The act for the registration of the poor was passed prior to the passing of the Reform Act, a privilege which it enjoyed since 1295 (23 Hen. I.). The right of election was in the resident freeholders. The Tavy formed the boundary of the parish. The will and the limits were defined by an artificial line. Under the Reform Act the borough was made co-extensive with the limits of the parish, the manor of Cudliperton excepted, and it still returns two members. The number of votes on the register in 1836, which is printed in p. ix. of the 'Tables' published by the Board of Trade, as an abstract of them is given in vol. iv., part 1. of the 'Journal of the London Statistical Society.' The population of the parish, in 1718, was 3117; in 1811, 4721; in 1821, 5092; in 1831, 5348; and in 1841, 5821. The increase from 1821 and 1831 is attributed to the extension of mining operations in the neighbourhood. There are some small manufacturing establishments. Tavistock is one of the post towns on the road between Plymouth and Exeter, and a canal has been opened, which, after a course of 5 miles, 2 of which under a tunnel, enters the Tamar at Morwellham. The head of the canal is connected with the quay by an inclined plane 240 feet high. This canal connects stock with Plymouth. Sir Francis Drake was a native of Tavistock.

TAWI-TAWI. [Ssolo Archipelagco.]

TAX, TAXATION. A tax is a portion of the produce and labour of a country placed at the disposal of the government. Taxation is the general charging and levying of particular taxes by the government upon the community.

Objects of Taxation.

In a free state it is assumed that all taxation is necessary for the public good; if it is not necessary, the reason for no longer exists. The amount of expenditure will be a measure of the tendency to be determined by the magnitude of the annual revenue and the importance of public expenses; but the influence of personal wealth and the value of personal affluence will affect the demands of the government upon the people, nearly as much as its necessities. The number of cases in which the private must be regulated by his income, but a person is generally paid at the same time, and the annual income of the public income that must be obtained to meet it. A civilized community requires not only protection against foreign enemies and the means of internal security, but it needs various institutions of civil government connected with its welfare, and which its wealth enables it to maintain
without an injurious pressure upon its resources. It is the business of a government to provide these, when proved to be necessary, in the best manner and at the least expense consistent with their efficiency.

The able and laborious committee of the House of Commons on the amendment of Adam Smith's inverted maxim 'unquestionably declared their full assent to the principle that no government is justified in taking even the smallest sum of money from the people, unless a case can be clearly established to show that it will be productive of some essential advantage, and that the means and external conditions are such as to make the emolument to the public income larger and of a smaller sacrifice.' The committee truly added to the statement of this just principle, that 'nothing requires more wisdom and prudence than to fix the public expenditure at a point, where the wants of the state shall be on the one hand just sufficient to carry on the public service, and on the other hand, where the wants of the people shall not be made to give way to any imaginary wants of the state: the latter arise from so many sources, that it is frequently very difficult to prevent the operation of an undue influence.' (Second report, p. 4.) One of the first duties of representatives of the people is to watch with jealousy the expenditure of the public money. Every tax should be viewed as the purchase-money paid for equivalent advantages given in return. This principle assumes the necessity of moderation in levying taxes, and will save many regular taxes, wasted in that form; yet it is not uncommon to hear it argued that so long as taxes are spent in the country, the amount is not of consequence, as the money is returned through various channels to the public service, an argument which gives them up for the sake of the tax. But when we have just laid down at once exposes the fallacy of this doctrine, by reducing it to a simple question between debtor and creditor. For example, by paying a million of money every year, the people obtain the services of an army, a fleet, etc., and thus redeems the debt. And further assume that the furniture of the army is purchased, and that the entire pay of the men is spent, within the country. The whole of the money will thus be returned; but how? Not as a gift, not as the repayment of a loan, but in the purchase of articles equal in value to the whole sum. The only benefit obtained by this return of the million is clearly nothing more than the ordinary profits of trade; for the community has already prepared and paid the money, and then out of its own capital and industry it produces what is equal to it in value, and this it sells to the state, receiving as payment the very sum it had itself contributed as a tax.

In whatever manner taxes may be expended, they must be regarded as injurious to the community. 'Every new tax,' says Mr. Ricardo, 'becomes a new charge on production, and raises the natural price. A portion of the labour of the country which was before at the disposal of the consumer is withheld from the disposal of the state, and cannot therefore be employed productively.' (Political Economy, chap. xii., p. 206.)

**General Principles of Taxation.**

Having settled that taxation should be generally and in amount as light as possible, it must be determined upon what principles and in what manner taxes may best be levied. No other branch of legislation is perhaps so important as the wise application of just principles in the matter of taxation. The wealth, happiness, and even the morals of the people are dependent upon the financial policy of their government.

Smith lays down four general maxims, which we shall briefly cite not only as being perfectly true in themselves and most valuable, but as proceeding from an authority so high that not to notice them might be accounted an omission.

I. The subjects of every state ought to contribute towards the support of the government as nearly as possible in proportion to their respective abilities; that is, in proportion to the revenue which they respectively enjoy under protection of the state.

II. It is not in the power of any individual to be bound to pay more than he can pay without being reduced to the meanest condition of life.

III. Every tax ought to be levied at the time or in the manner most likely to be convenient for the contributor to pay it.

IV. Every tax ought to be so contrived as both to take out and keep out of the pockets of the people as little as possible over and above what it brings into the public treasury of the state.

In discussing the merits of particular taxes and classes of taxes, we shall have to consider with some minuteness the application of the tax. Its justice requires no enforcement or illustration, although unhappily the subject is most difficult of attainment. The second maxim is of great importance, and the necessity of adhering to it must be universally acknowledged. Uncertainty gives rise to discontent, and in the case of the most useful public services, ill-will and suspicion on that of the contributor, while it offers a most injurious impediment to all the operations of trade. Notwithstanding the many evils of uncertainty, it is not by any means a common fault even in modern systems of taxation. We would pass over the Eastern despotisms, where uncertainty and caprice prevail instead of fixed rules, but that the vices of their taxation are so exaggerated as to show the evils of a departure from just principles in the broadest light. All taxation is forbidden by the Koran, and although the prohibition has been evaded and broken through by the Turkish government in particular instances, it has always been an obstruction to any general system of imposts. In the absence of fixed rules, regular exactions are required to be made to supply the wants of the sultan. Plunder becomes the business of every governor of a province, and thus the Koran, instead of defending Moslems from tax-gatherers, becomes a sort of protection to them. The revenues of his property for an instant; all are compelled carefully to conceal their possessions, lest they should lose their liberty or possibly their lives and property too. Industry is thus not merely cramped, but almost prevented or depressed, so as to be unable to enjoy the improvement in their enjoyment of its rewards. The country, fertile in its resources of all kinds, is left waste, or only cultivated as far as the absolute necessities of providing sustenance may require. The nearer you approach with the seat of government, this is more the case; and the neighbourhood of the capital, which in other countries is naturally the scene of extended labour, thick population, and great cultivation, is in Turkey marked by barrenness and neglect. Constancy of supply can only be approached on the land evidence of a prevailing through extensive wastes without either man or beast or tillage.' (Political Philosophy, ch. 3.)

In Persia the same uncertain and oppressive mode of exacting money for the use of the sovereign is resorted to, and is followed by similar results. Under the more constitutional governments of Europe the people do not indeed suffer from violent exactions, but industry, production, and commerce are too often repressed. Well-defined taxes generally afford many examples of misgovernment, and the injurious character of its taxation is shown in reference to this as well as other principles. To select one instance of uncertainty: Every owner is liable to have his property taken in execution for government taxes, if he is not prepared to pay a half-year or more in advance, according to the difficulties of the Exchequer; consequently he is often compelled to make great sacrifices in order to meet such exigencies.' (Madrid in 1826, vol. ii., p. 107.)

Perhaps there is no better example of the evils of uncertainty than that of the Stade duties levied by the king of Hanover upon all ships passing up the Elbe from the sea, and upon their cargoes.

The tariff taxes 2088 articles of commerce, and lays general duties upon the same articles, so that the whole number of duties is 6088. 'There are 35 different duties upon iron; 32 duties upon yarn or twist; 18 duties upon sugar; 42 upon leather; 36 upon oil; 126 upon wood, and so on with respect to other important articles of trade.' The tariff also 'resorts to all modes and devices of taxation, by weight, by measure, by number, by value, and what is worse, it vests in the custom-house officers the sole discretion of determining how much tax an article shall be assessed at. The collector imposes that kind of duty which will produce the most money in the particular case. The consequence of this to the merchant is most serious. He cannot calculate or inform himself before he makes such a large outlay of money to pay at Brunshausen.' (Edinburgh Review, No. cl., p. 361; Hut's Stade Duties.) There are also arbitrary fines for trivial informalities in the ship's papers, and which are said to rest practically with the subordinate officers, who
likewise harass the merchants with a multitude of petty exactions for their own advantage. Such a system, it need scarce be said, would discourage trade and commerce. British merchants have been loud in their complaints, and the governments of this country and of Hanover have recently engaged in negotiations, which, it may be hoped, will settle these obnoxious duties upon more equitable principles.

To levy a tax on the time and in the manner most likely to be convenient for the contributor to pay it, is always a wise policy on the part of the state. The time or manner of payment may often be more objectionable than the amount of the tax itself, and thus have the evil effects of high taxation, while it produces no revenue to the state. Suppose, for example, that a merchant imports goods and is required to pay a duty upon them immediately and before they can be sold. He must forego the profit he made on the value of the goods as soon as he shall have paid the tax, and he is altogether left exposed to be injured by a rise of prices, or to be perhaps robbed of his goods if he shall, at least, be for the benefit of the revenue, for then his contributions may be diminished in some other direction.

Great attention has been paid, of late years, to the improvement of the regulations for the collection of duties by the Commissioners of Inquiry, under the able direction of Sir Henry Parnell. Various restrictions have been removed, and it is to be hoped that the excise revenue may be found capable of being collected without inflicting greater injuries upon trade than other branches of taxation.

The net produce of a tax is all that the state is interested in, and therefore any violation of the fourth maxim of Adam Smith is liable to the same objections as those already stated in reference to the third. Such violation increases the amount of the tax directly, and the former was shown to increase it indirectly, without any advantage to the state. Facility of collection is a great recommendation to any tax, and, on the contrary, a disproportion between the cost of collection and the amount of the revenue will be a just ground for removing a tax, though founded, in other respects, upon just principles. On this account alone, as well as for the general convenience of trade, it is worthy of serious attention, whether the customs duties upon a great number of articles of consumption should not be altogether repealed. Although great alterations have recently been made in our tariff, the number of articles remains the same. In 1839 there were 349 distinct articles, each producing less than 100l. a year, in the aggregate only 8050l. There are also 132 articles producing from 100l. to 500l. each, and altogether 31,629l., while 46 articles produced 685l. per cent. of the whole customs revenue. (Import Duties Report, 1840, p. 4.) It is obvious that the examination of the official reports will point out the greatest package, and the assessment of nearly 1200 different rates of duty, must greatly increase the establishment required for collecting this branch of the revenue. The cost of collecting the duties upon the larger and more productive articles of import could bear but a small proportion to the amount of the tax.

The following table may be interesting as showing the rate at which the whole revenue is collected in the United Kingdom.

Table showing the Cost of Collecting the Revenue of the United Kingdom of Great Britain and Ireland for Ten Years, from 1832 to 1841 inclusive (compiled from the Annual Finance Accounts).

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross Receipt of Revenue</th>
<th>Charges of Collection</th>
<th>Cost per cent. for which duties are actually collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1832</td>
<td>£ 4,571,459</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
<tr>
<td>1833</td>
<td>£ 4,571,116</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
<tr>
<td>1834</td>
<td>£ 4,753,546</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
<tr>
<td>1835</td>
<td>£ 5,240,902</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
<tr>
<td>1836</td>
<td>£ 5,973,677</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
<tr>
<td>1837</td>
<td>£ 5,287,737</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
<tr>
<td>1838</td>
<td>£ 5,279,536</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
<tr>
<td>1839</td>
<td>£ 5,314,438</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
<tr>
<td>1840</td>
<td>£ 5,916,049</td>
<td>£ 674,131</td>
<td>11</td>
</tr>
</tbody>
</table>

There is little variation from year to year in the gross charges of collection, but there is a considerable disposition in the cost of collecting different branches of the revenue. In 1841 the excise cost 6d. 7s. 5d. per cent. in the collection; the assessed taxes 4l. 2s. 6d.; and the revenue arising from stamps only 2s. 6d. 4d. The comparison is therefore made at a much greater cost.

For some years past the average revenue of that country has been 1,020,000,000 francs, or 40,000,000l., and the expense of managing and collecting that sum has amounted to not more than 3,100,000 francs, or 100,000l. per cent. (Commercial Jurisprudence, Part IV, France, 1841.) It is very probable that many items may be included in

\[\text{TAX} \quad \text{TAX}\]
the French estimation of the expenses of collection which are not stated in the English accounts; but making liberal allowance on that account, a great disproportion remains between the cost of collecting the revenue in the two countries. It may perhaps be fairly estimated that the revenue in France does not bear twice as much the collection to the cost of the collection to the English country. The expense of collecting the revenue may be high without any reference to the mode of taxation. An excellent tax may be collected in a bad manner, either by having numerous idle and highly paid officers, or by corrupt means, and the same may be collected to the cost of the collection to the English country. The expense of collecting the revenue may be high without any reference to the mode of taxation.

Different Classes of Taxes.

In selecting one or more classes of taxes for raising the revenue of a state, the principles already discussed should be adhered to as far as possible; but these do not point out any particular mode of taxation as preferable to others. Whatever mode of raising the necessary funds may be found to press most equally and fairly upon the community, is most liable to objections of uncertainty, or inconvenience in the mode or time of payment, or to be attended with the least expense, is fairly to be preferred. In the choice of a statesman; unless objections of some other nature can be proved to outweigh these recommendations.

The two great divisions under which most taxes may be classed are direct and indirect.

1. Direct Taxes.

All taxes ought to be paid from the income of the community. To derive revenue from capital is to set the people in private life, must be condemned. If the taxes of any country should become so disproportionated to its income, that in order to pay them continual burdens must be made upon its capital, its resources would fail, employment of labour would decrease, and the revenue most necessarily be reduced by the general impoverishment of the tax-payers. Such a system could not long continue as regards all capital, but it may affect particular branches of it, or all capital in one country, in the same manner; even where the tax is permitted to operate it is injurious. A tax upon legacies is obviously a direct deduction from capital, and on that account objectionable, although it is profitable to the treasury and very easily collected. In this country, a tax on left estates, stamp duty of 10 per cent., and even when left to relatives the scale of duties is sufficiently high to cause a serious diminution of the capital.

A further duty is charged on proving a will, called probate-duty, which is payable on the most frequent paid out of capital than income. The same observations will, of course, apply to duties charged upon succession to the personal property of intestates.

With these exceptions it has been the object of the British legislature to tax the people, as far as possible, from taxes from income, either by direct assessment or by means of the voluntary expenditure of the people upon taxed commodities.

Direct taxes upon the land have been universally resorted to by all nations. Such taxes are obvious and just; for in countries without commerce, land is the only source from which a revenue can be derived. In most of the Eastern monopolies, the greater part of the revenue has usually been raised on the land. The value of land and of its produce offers great temptations to immediate taxation. In Spain, at the present time, the taxes upon the soil are most oppressive and injurious. ‘The tax imposed on corn-fields is so heavy, that farmers in general spurn but little refinement to fill their lands at all, than to run the risk of losing their costs and charges, and their labour to boot, by the exorbitancy of the intendente’s demand which they have to meet. They have adopted the plan therefore of sowing no more wheat than is necessary for the sustenance of their families. It is quite clear indeed to all who are conversant with the state of agriculture in Spain, that unless a complete change takes place in the system of taxation, so as greatly to reduce the burdens upon the land, there will not only be a stagnation in rural industry, but eventually the country will cease to produce a sufficient quantity for its own consumption of that most essential article of food — wheat on which Spaniards pride themselves, and which it is generally grown in sufficient quantities to supply all the markets in Europe.’ (Madrid in 1885, vol. ii., p. 109.)

The land-tax in England is one of considerable antiquity. We find it mentioned in the thirteenth century. It is objectionable, it was customary to purchase their resources for large sums of money; and as the ordinary revenues of the crown were not sufficient, a tax was imposed on private lands in the form of a tax for the year. It seems to have been first imposed a.d. 901, and was called Danegeld, or Danish tax or tribute. (Saxon Chronicle. By Ingram, p. 108.) It was originally one shilling for each hide of land, but afterwards rose so high as seven: it then fell to four shillings, at which rate it remained till it was abolished about seventy years after the Norman conquest. (Henry, Hist., vol. ii., p. 586.) A revenue still continued to be derived under different names from assessments levied on all persons who owned lands, which were merged in the general subsidies introduced in the reigns of Richard II. and Henry IV. During the troubles in the reign of Charles I. and the Commonwealth, the practice of laying weekly and monthly assessments of a certain sum upon several counties was reported to be exceedinglyobjectionable, that after the Restoration the ancient mode of granting subsidies was renewed on two occasions only. (Report of House of Commons on Land Tax as affecting Catholics. In 1682 a new valuation of estates was made, and four rates or payments were proposed: a five-hundred or other division. These payments have varied in amount from 1s. in the pound to 4s. on the assessed annual value, according to the annual Land Tax Acts, but the fixed rate was 4d. in the pound. The valuation is the old valuation of 1685, and the proportion chargeable to each district has continued the same as it was in the time of king William III., as regulated by the Act of 1692. That assessment is said not to have been accurate even at that time, and of course improved cultivation and the application of capital during the last 140 years have completely changed the relative value of different portions of the soil. On account of the generally increased productivity of land, the tax, which is still of the same kind, is much too low; the inequality is very great. For instance, in Bedfordshire it amounts to 2½. id. in the pound; in Surrey, to 1s. 1d.; in Durham, to 3d.; in Lancashire, to 2½.; and in Scotland, to 2s. 6d. per pound, according to Act of 1636, p. 454.) Adam Smith imagined that this tax was borne entirely by the landlords, but this opinion has been proved to be erroneous by modern political economists, who hold that the tax increases the price of the produce of the land, and is therefore paid by the consumers. Of that we entertain no doubt; but we are unable to agree with Mr. Ricardo, that the English land-tax is not objectionable as regards Adam Smith’s first principle, viz. the ground of inequality. (Political Economy, chap. vii.) He assumes that inferior land would not be cultivated until the price of produce had become so high as to remunerate the grower after payment of the tax; and that the owners of the soil therefore would not suffer, but only the consumer. But it is often customary and pleasant, for speculative purposes, while in this country, the exclusion of foreign supply at a time when population was rapidly increasing has forced inferior soils into cultivation. Then admitting that the consumer pays the tax, the owners of land would not be by the same relation to each other as merchants would be who should be charged unequal rates of duty upon articles in which they deal. In that case the consumer would ultimately pay the tax, but no one who produces it. Hence the highest tax in the first instance meets his competitor at a disadvantage in the market. He must wait for very high prices, or must sell at lower profits. Such is actually the case when articles imported from different countries bear unequal rates of duty; and such, we apprehend, must be the case where the land is unequally assessed according to its value. (Land-Tax.)
A tax upon the gross rent of land would fall upon the landlord, and would be in fact a tax upon his annual income, and as such would fall with undue severity upon him, unless other classes of the community were liable to a proportionate deduction from their respective incomes for the benefit of the state. This brings us to consider the expediency of a general tax upon all incomes.

As the object of taxation should be to obtain from each individual in a state a contribution to the expenses of government, it might be held that the notion of being clear as capital, and the payments being no longer optional, as the insurance could not be discontinued without loss; this provision was made by Mr. Pitt in 1775: in that case, incomes at a given rate, and not exceeding a certain proportion, and higher than the rates of trades and professions; 3rdly, annuities should be rated on such terms as to avoid the assessment of any portion of their capital as part of their income; 4thly, all persons should be liable to the tax, whatever may be the amount of the incomes.

In addition to the unequal pressure of an income-tax, which cannot be altogether corrected by any expedients, there is much uncertainty in the assessment of a tax upon incomes, in the cases of accidental or deferred payments, renders the incomes of commercial and professional men very uncertain; and nominal income therefore, which afterwards cannot be realized, may be charged upon the tax.

But the last and strongest of the objections to an income-tax is the inquisitorial nature of the investigation into the affairs of all men, which is necessary to secure a statement of their incomes. This objection indeed is felt by all men in a state of public order, of government, of enjoyment, of each others, it is considered, beyond all question, as the least inconvenient and unreasonable quality of an income-tax. Even if the exposure of a man's affairs could do him no possible injury, yet as an offence to his feelings, or even as to save them, it is a hardship not to be conceived; while other descriptions of income are often known only to the possessor, upon whose declaration alone, in such cases, reliance must be placed.

But supposing that either by declaration or by proof, or by both combined, the actual income of each individual could be ascertained, the mere income of persons is a most fallacious test of their means or ability to bear taxation. One man has a fee-simple estate in land, or money in the future proceeds, being an income of 1000l. a year, which will descend to his children after his death; another, by a laborious and uncertain profession, also obtains an annual income of 1000l., dependent not only upon his life, but upon his health and a thousand accidents. The annual incomes of these two men are the same, but their circumstances are most dissimilar. Before the latter could be placed in the same position as the former, he must have an income large enough to enable him to insure his life for a sum of whatever kind, it would be 1000l. left to spend annually, after the payment of the premium. But even then, if he should lose his health, his present income would fail him, he would not be able to continue the insurance, and his position therefore would still be very much inferior to that of the proprietor of the or funded property. Yet these two men, with means so unequal, would be assessed alike, and charged with equal contributions. But suppose that, instead of insuring his life, the professional man should save half his income every year, he would still be charged upon the whole, and thus his capital as well as his income would be taxed.

The case of annuities also may be instanced as one, amongst numerous others, of peculiar inequality. One person may in preference to money securities, retain his capital, but derives a small income, and therefore contributes a proportionally small rate of tax: another purchases an annuity, and parts with his capital; but as his income is much larger than that of the capitalist, he pays a higher tax. At first sight this may appear a just arrangement; but in fact not only the income of the annuitant is taxed, but also his capital; for that which is taxed as his income is derived partly from the interest of his purchase-money, and partly from an annual repayment of a portion of his original capital.

These and many other evident cases of inequality can scarcely be questioned; but it is alleged that other taxes press with as much inequality upon different classes of persons as taxes upon incomes. The idea of taxing an estate to equalize the pressure, as the causes exist in the circumstances of the people, and not in the nature of the taxes. (Pitt's Speeches, vol. iii., p. 9.) It is said that the assessed taxes affect the professional man to the same extent as the man of property. There is however this essential difference between taxes upon income and taxes upon expenditure: the former are compulsory, the latter are voluntary, and paid or avoided at the option of each individual. If a man saves money, an income is derived upon his capital: a tax upon expenditure is levied upon that portion of his income only which he thinks it prudent to spend.
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who is intended to pay it; but if a very heavy tax were imposed, it would discourage the occupation of houses, lessen the demand for them, and thereby diminish the real value of the land, and all other goods that might be transferred to him. (Adam Smith, book 5, chap. ii; Ricardo's Political Economy, chap. xiv.) Such a tax would be attended with very bad consequences; it would compel many persons to live in inferior houses or in lodgings, and so destroy foreign commerce as well as the comfort of their habits of life; and by reducing the demand for houses it would limit the employment of capital and labour in building. The direct taxes upon ovens, carcases, hair-powder, armorial bearings &c., being paid voluntarily by the rich, and not by the poor, are not likely to meet with many objections. The use of such articles generally indicates the scale of income enjoyed by the contributor, and the tax is too light to discourage expenditure or to make any sensible deduction from his means.

A very fair principle of levying a direct tax is exhibited by the assessment of property in every parish in England and Wales to the poor rates. Local knowledge renders a perfectly correct valuation possible, and every parish or occupying land, houses, or other property within the parish, is assessed so much in the pound upon the annual value thereof, to raise the necessary funds for the support of the poor.

The advantages of direct taxation are too numerous to enter upon, especially as many of them involve the discussion of principles of political economy which would carry us far beyond our limits. For arguments and illustrations concerning the incidence of duties, of taxes upon goods or persons, or on situations, or on transactions, we refer to the able works of Adam Smith, Ricardo, Malthus, and other eminent writers upon political economy.

II. Indirect Taxes.

In preferring one tax to another, a statesman may be influenced by political considerations as well as by strict views of financial expediency, and nothing is more likely to determine his choice than the probability of a cheerful experience on the part of the people. All taxes are disliked, and the more directly and distinctly they are required to be paid, the more hateful they become. On this, as on other grounds, 'indirect taxes,' or taxes upon the consumption of articles of merchandise, are generally charged in high favour with most governments. 'Taxes upon merchandise,' says Montesquieu, 'are felt least by the people, because no formal demand is made upon them; hence they will scarce know that they pay them. For this end it is a great consequence that the seller shall pay the tax. He knows well that he does not pay it for himself; and he buyer, who pays it in the end, confounds it with the price of the article which he purchases. It is a great advantage that indirect taxes are apt to be undervalued by writers in political economy; but it is undoubtedly a great merit to the system of taxation (which is but a part of general government) that it should be popular and not give rise to anger and discontent. A tax that is positively injurious to the parties who pay it without thought, is, certainly not to be defended merely on the ground that no complaints are made of it; but it may be safely admitted as a principle, that such taxes are paid out of the pockets of the people, that is the best which is most acceptable to the people.

The very facility, however, with which indirect taxes may be levied, makes it necessary to consider the tendency and effects of them with peculiar caution. The statesman has no warning, as in the case of direct taxes, that evils are caused by an impost which is productive of which every one seems willing to pay. When any branch of industry is visibly declining, and its failure can be traced to its circumscription and its burdens by a direct tax, the necessity of relief is felt at once; but if trade and manufactures are flourishing, and the country advancing in prosperity, it is difficult to detect the latent influence of taxes in restraining that progress, which but for them would have been more rapid than it has been. It is only by experience that the precise point can be found at which the revenue is most productive, consistently with an unchecked consumption and an absence of smuggling; but it may be assumed as certain that whenever a tax adds very greatly to the expense of general consumption, it puts it out of the reach of many who are anxious to purchase it, and tempts smugglers, by the chance of a large profit, to evade the payment of the duty. On the contrary, when a duty is moderate, a little
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to the price of an article, that it will scarcely affect its consumption; and the profit arising from evasion of the duty is so small as not to cover the risk and penalties of detection. In proof of these facts there has been ample experience in the taxation of this country, and a few instances may serve as instructive illustrations.

In 1823 the excise duties upon Scotch and Irish spirits were reduced from 5s. 6d. to 2s. per gallon, and the immediate effect produced upon the object of the apparent consumption and upon the revenue will appear by the following statement for the two years preceding and following the reduction.

Quantities of spirits made in Ireland and Scotland, which paid duty for home consumption, stating the rate of duty paid, and the net revenue:

**IRELAND.**

<table>
<thead>
<tr>
<th>Gallons</th>
<th>Rate of Duty</th>
<th>Net Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1821</td>
<td>2,649,170</td>
<td>£912,288</td>
</tr>
<tr>
<td>1822</td>
<td>2,329,397</td>
<td>770,518</td>
</tr>
<tr>
<td>1823</td>
<td>3,348,505</td>
<td>634,160</td>
</tr>
<tr>
<td>1824</td>
<td>6,690,315</td>
<td>771,690</td>
</tr>
<tr>
<td>1825</td>
<td>5,262,714</td>
<td>1,084,191</td>
</tr>
</tbody>
</table>

In 1826 6d. was added to the duty, and again in 1830 a similar addition was made, the effect of which is shown by a continuation of the statement:

**IRELAND.**

<table>
<thead>
<tr>
<th>Gallons</th>
<th>Rate of Duty</th>
<th>Net Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1826</td>
<td>6,837,408</td>
<td>£964,509</td>
</tr>
<tr>
<td>1827</td>
<td>8,220,919</td>
<td>1,122,096</td>
</tr>
<tr>
<td>1828</td>
<td>9,537,913</td>
<td>1,395,721</td>
</tr>
<tr>
<td>1829</td>
<td>9,212,223</td>
<td>1,305,065</td>
</tr>
<tr>
<td>1830</td>
<td>9,034,538</td>
<td>1,108,129</td>
</tr>
<tr>
<td>1831</td>
<td>8,710,672</td>
<td>1,451,560</td>
</tr>
<tr>
<td>1832</td>
<td>8,657,756</td>
<td>1,442,845</td>
</tr>
<tr>
<td>1833</td>
<td>8,186,596</td>
<td>1,360,759</td>
</tr>
</tbody>
</table>

**SCOTLAND.**

<table>
<thead>
<tr>
<th>Gallons</th>
<th>Rate of Duty</th>
<th>Net Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1826</td>
<td>2,229,435</td>
<td>£727,650</td>
</tr>
<tr>
<td>1827</td>
<td>2,070,756</td>
<td>691,136</td>
</tr>
<tr>
<td>1828</td>
<td>2,232,727</td>
<td>536,654</td>
</tr>
<tr>
<td>1829</td>
<td>3,430,301</td>
<td>520,624</td>
</tr>
<tr>
<td>1830</td>
<td>3,911,550</td>
<td>685,488</td>
</tr>
</tbody>
</table>

These tables show the effects of taxation in encouraging or repressing smuggling, rather than its influence upon consumption. Taking the case of Ireland, it would be impossible to believe that the actual drinking of spirits could have been increased more than thricefold in a few years, even if there had been no evidence of illicit distillation; but before the reduction of duty in 1823, an enormous amount of smuggling had been detected, and there were other means of estimating the extent of frauds practised upon the revenue. For instance, in 1811, the duty had been only 2s. 6d. a gallon, and in that year no less than 6,500,361 gallons had paid duty; while, in 1822, when the duty was 5s. 6d., only 2,232,397 gallons were brought to charge. The revenue commissioners, on the recommendation the duty was reduced in 1823, then estimated the annual consumption of spirits in Ireland at ten millions of gallons, and the illicit supply at about seven millions. (Fifth Report of Revenue Commissioners, pp. 6, 19.)

In 1827 the duties on spirits made in England were reduced from 12s. 6d. to 7s. a gallon. The average consumption for three years to 1827 was 3,677,457 gallons, and the revenue 2,951,526. In 1829 (only two years after the reduction) the consumption was 7,700,786 gallons, or the revenue 2,925,289l. or 413,742l. more than the duty had produced. (Parnell's Financial Reforms, p. 4.)

It has been a common opinion that spirits should be treated merely as a source of revenue; but that was injurious to the morals of the people, the consumption of them should be repressed by heavy duties. It has since appeared that it is in the power of the government to limit the consumption of spirits, and at the same time to raise a large revenue from it. The object is equally a good one if it could be secured: but the result of numerous experiments has proved that taxation should be connected with reference to the incomes of other objects obtaining a revenue in the best manner; and that the interests of a country are promoted by following one set of principles of taxation, rather than by seeking success and by a violation of those principles, to accomplish a object which, if attainable, can only be attained by other means. The signal failure of a measure in the last century for encouraging the drinking of spirits is a strong example of the futility of attempting to force a change in the habits of the people by a tax. In 1826 a tax of 2d. a gallon was imposed upon all spirits, with very heavy penalties for evasion of the duty. The tax was extremely unpopular; and was evaded to such an extent, that in two years less than 12,000 persons were convicted of offences under it. Indeed the measure proved altogether impracticable, and so impracticable, that it was abandoned after seven years of vexatious and unprofitable trial.

High duties upon foreign articles imported into any country are liable to all the objections which have been detailed, and on an average for the seven years the number of gallons entered for home consumption was 1,620,000. In 1814, the duty was reduced to 10d., and on an average for the same period the number of gallons entered for home consumption was 7,421,000, and the revenue 825,000l. A tax of 5s. 6d. a gallon was sustained by the revenue, the legitimate in brandy discouraged, and a rich premium offered to smugglers. The present duty is 1s. 6d. a gallon, and the year ended 5th May, 1842, only 1,861,640 were entered for home consumption, the gross revenue which was 1,347,641l., or 23,330l. less than in 1814, withstanding the great increase of wealth and population. That French example has shown that this country in large quantities is notorious; and when consider that the duty is estimated at 400 or 600 per cent. on its original price abroad, the inducement to evade it is such that all the duties in the world cannot be surprized of, if all those who profit by it. Our customs establishment is rendered ineffectual by such a machine. As certain and regular is the smuggling trade, that is made the subject of insurance, other commercial and it is even said at premiums of from 10 to 15 per cent. which bear no proportion to the profits, if the speculator be successful.

The success of moderate duties upon articles of consumption, in encouraging the use of them, places upon the reach of a larger number of persons of the same thing, augmenting the revenue, has been shown than in the article of coffee. In 1825 the duty on British plantation coffee was 1s., upon East India tea, and upon foreign coffee 2s. 6d. per lb. In 1826 these duties were reduced one-half, and the consumption has been more than doubled, and the revenue has been more than doubled, and the revenue has been more than doubled.

The number of gallons of brandy and geneva imported and retained for consumption, on an average for four years to 1807, was 1,861,640. The duty was then 1s. 6d., and the revenue 1,570,000l. In 1814 the duty was reduced to 10d., and on an average for the seven years the number of gallons entered for home consumption was 7,421,000, and the revenue 825,000l. If a tax of 5s. 6d. a gallon was sustained by the revenue, the legitimate in brandy discouraged, and a rich premium offered to smugglers. The present duty is 1s. 6d. a gallon, and the year ended 5th May, 1842, only 1,861,640 were entered for home consumption, the gross revenue which was 1,347,641l., or 23,330l. less than in 1814, withstanding the great increase of wealth and population. That French example has shown that this country in large quantities is notorious; and when consider that the duty is estimated at 400 or 600 per cent. on its original price abroad, the inducement to evade it is such that all the duties in the world cannot be surprized of, if all those who profit by it. Our customs establishment is rendered ineffectual by such a machine. As certain and regular is the smuggling trade, that is made the subject of insurance, other commercial and it is even said at premiums of from 10 to 15 per cent. which bear no proportion to the profits, if the speculator be successful.

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The slight falling off in the last year may be accounted for by the general depression of trade, and perhaps in some cases the consumption of an addition of 5 per cent. to the customs duties, which was this year abandoned.

In 1835, the produce of British possessions in India was admitted at the same duty as plantation coffee, at 4d. per lb., and the effect of the reduction, in encouraging the growth of the plant in India and the consumption of the berry in this country, has already been very great, and perhaps the coffee trade of the East may as yet be considered in its infancy. In 1834, the year before the reduction, 8,675,961 lbs. were imported from the East India Company’s properties in Ceylon, 4,572,584 lbs. in 1840, 18,650,688 lbs., or nearly double. The new customs tariff affects a further reduction of duty. That on foreign coffee is for the future to be 8d. a lb., and on coffee the produce of British possessions only 4d. An increased consumption and increase of duty are required for this measure, and ultimately the revenue will be improved.

Thus reductions of existing duties are proved by these examples to increase the revenue; but whether the effect of the amendments or those adjusted by the statesman depend upon a variety of circumstances. If the reduction produces an end to extensive smuggling, the revenue will derive immediate benefit, as both the demand and the supply of the article clearly exist, and the reduced tax, without affecting products as a police regulation, will protect the revenue from fraud. But where there is little or no smuggling, and the revenue can only be increased by means of additional consumption, the effect of reduced duties may be deferred and even remote. The key words and other causes may delay, for a considerable time, the increase of revenue may be required to provide in sufficient quantities for the growing demands of the consumer; and even if the supply become abundant, the habits and tastes of a people cannot be changed on a sudden. The high duties of taxation, the expensive duties which they have to do without. But once the great mass of the people have been made to take as an increase of consumption as would make up for the reduced rate of tax, especially when the reduction has been so great as to require an extraordinary addition to the previous amount of consumption, before the sacrifice made is likely to be in excess. It is an increase of revenue may be expected. Sugar is an article of this description. It has become a necessary of life as well as a favourite luxury. There are scarcely any limits to the supply that can be made to the present duties are altogether to price and check consumption. As a proof of the success with which the consumption of foreign sugar might be expected to increase if the excessive duties were lowered, we may refer to the effects of equalizing the rates on East and West Indies sugars in India. In that year the duty on East India sugar was reduced from 324. 4c. to 2½s. In 1835 the quantity imported had been 1,767,656 cwt., and in 1837, one year after the change, the import had increased to 302,945 cwt.; in 1838, it had increased 44,632 cwt., and the excess which would have been occasioned by such a tax was diminished only by one-fourth, and the consumption was immediately more than doubled, the revenue at once and considerably by the reduction of duty.

A similar financial experiment will serve to show how an increased consumption is urged upon as the result of an augmentation of taxes upon articles of consumption. In 1840 an addition of 5 per cent. was made to all the duties of customs and excise, and a proportionate increase of revenue was anticipated, but not realized. The net produce of the customs and excise in the year ending January 9th, 1840, amounted to £911,5067. The estimated produce for the year ending January 9th, 1842, was £39,807,081; 1,857,575, being expected from the additional 5 per cent. The actual increase however was only 206,715, or little more than one-half per cent., instead of the 5 per cent. which had been expected. This result was unseasonably in consequence of a great reduction of trade, and by the consequent distress which prevailed in that year, but we notice it because the principle of an indiscriminate augmentation of existing taxes, without reference to their present amount, character, and circumstances, is very unwise. We contend that a correct tariff will show the precise rate of a particular tax which will not affect consumption and will at the same time discourage smuggling. It must be presumed that existing rates have been fixed in order to secure these results, and that they are justified by experience. To add to them therefore, not because they are insufficient for their immediate object, but because a general addition to the revenue is needed, is to neglect experience and to disturb the proper relations of the duties on tax and tax upon particular articles. During the last century it was a common practice to add as a general per centage of increase upon all the customs duties whenever the revenue was found to be insufficient for immediate purposes. To this indiscriminate practice must be attributed the anomalies which up to this time have existed in the British tariff. Any recurrence to so unscientific a mode of taxation should be avoided. The tax upon each article ought to be fixed upon sound principles, and then should not be changed merely to save the tax-payer from the unpopular tax for increased taxation or of inventing new burthens.

Protective, Discriminating, and Prohibitory Duties.

The legitimate object of taxation is that of obtaining a revenue in the least injurious manner for the benefit of the community; but this object has constantly been overlooked for the sake of ends not fairly to be accomplished by every means in its power to encourage agriculture, trade, and manufactures; and it would be culpable to neglect any proper means of encouragement, which are not only beneficial to particular interests, but add to the general prosperity. The nature of the question is such that most legislatures upon this point has been misdirected. They have seized upon taxation as the instrument of protection and encouragement; and, using it as such, have injured the countrymen, and ultimately have failed in promoting the very objects they had intended to serve. All that we can hope in this and other European countries is a gradual adoption of sound principles, and the correction, at some distant period, of the errors of the past. If the system of protection has already, severe injuries and even injustice are inflicted whenever an attempt is made to undo the mischief which has been done. Reason and experience unite in teaching the impiy of policy of protective duties; and, in our country, it is so generally acknowledged, that nothing but the extreme difficulty of withdrawing the protection which has been given obstructs legislation upon sound principles.

The object of a protective duty is to raise artificially the price of the protected product over that of similar commodities of one country as compared with the produce or manufactures of another. A heavy tax easily effects this object, and thus prevents competition on the part of that country whose commodities are taxed, and establishes a monopoly in the supply of those commodities in favour of the protected article. It is evident that the tax must be increased to an extent which will fill the coffers of the state. The loser is the consumer, whose goods are denied a market; the loser. Who then gains by these losses? Not the consumer; for the more abundant the supply, the better and
ceaper will he find the market; but the seller, who is enabled to obtain a high price for his wares because he has the sole of them to the only party of gain. The community at large suffers doubly: first, by having to buy dear instead of cheap goods, or by being denied the use of them altogether; and secondly, by being obliged to pay other taxes which would not have been required, if the duty on the cheaper goods had been charged. These gains are enabled to the moderate impost. Even the sellers, for whom all these sacrifices are made, do not derive the benefit which might be expected. In the goods which they sell the case is, indeed, the opposite. They are gainers by the levying of other import duties; for by an artificially high price, like the rest of the community. It constantly happens, too, that although the prices at which they sell are high, their profits are reduced, by the competition of others selling the same articles, to the general level of profits throughout the country. When this is the case, all parties, without exception, are losers - the state, the community, and the monopolists. The general injury done to trade by the protective system is too extensive a question to enter upon here. It is well illustrated in the Report of the Committee of the House of Commons upon Import Duties in 1840.

Protection may be accomplished by actual prohibition of the import of particular articles, or by exorbitant duties without any prohibition, or by such duties only as give the home producer an advantage. Duties may also discriminate between the produce of different countries, and give the preference to some, to the injury and exclusion of others.

In this country all these modes of protection have been resorted to. For the protection of agriculture, foreign cattle, sheep, swine, beef, mutton, pork, and other provisions have been entirely prohibited. High duties have been levied on the importation of such articles as have a share in the provision of the home market, so devised as to exclude it entirely, except in times of scarcity; and more moderate duties are payable upon various articles of agricultural produce. The prohibitions however have recently been removed, and moderate import duties imposed. In 1840 the corn duties were still adhered to, as it was considered, and, it is hoped, will hereafter admit a larger amount of foreign grain, and enrich the revenue. The principle of a sliding-scale, as would here observe apart from our general policy, is very injurious to the revenue. When the high part of the scale is in operation, it acts as a prohibition; and when the lower duties only are payable, they are comparatively unproductive. The loss sustained by the consumers from the importation of duties on the scale has been variously estimated at from 12,000,000/ to 50,000,000/ a year; and yet it is well known that money invested in the purchase of land produces a very low rate of interest, not exceeding 3 per cent., and that persons endowed for life for whom protection is obtained, have been continually complaining to parliament of their distress.

Upon various articles of manufacture there have been prohibitory and highly protective duties. In 1825 the former were removed; and the latter have, in the present session of parliament (1842), been so modified as to be very fair taxes for the purposes of revenue.

Duties are called discriminating when they are not levied equally upon the produce or manufactures of different countries. The object of them is to give an advantage to the country on whose commodities the tax is lightest, as compared with others. To obtain such a preference has been the object of various negotiations and commercial treaties between different states, as it opens extensive markets to the industry of the favoured nation. By the present commercial policy of England, the principle of discrimination may be said to be confined to the protection of our colonies against the competition of foreign commodities. Each colony is to enjoy equal commercial advantages in their intercourse with England. Our colonial policy is so wide a question, involving political and commercial considerations of high importance, that it can only be touched upon now. It may be considered that the colonies should form an integral part of the mother country, and that the commercial intercourse between the several parts of the British empire ought to be viewed as a vast coaling-trade. If this principle were acted upon, it would certainly present a grand fiscal union worthy of admiration; but the existing system does not partake in any degree of the character of a common trade. To put it upon such a footing, the duties on colonial produce should be little more than nominal, and we should rely upon reductive imposts upon foreign produce for our revenue. Our practice is the reverse of this. Where our tax discriminate, we derive our revenue from the colonial duties; and we either exclude foreign produce altogether, or limit its introduction so much as to prevent it from contributing materially to the revenue. The object of duties upon the foreign produce, which would enter the kingdom, is to secure the maintenance of a protected manufacture, for the sake of creating a monopoly in favour of the latter. This system we have already condemned, when established for the protection of trade and agriculture in the mother country; and upon fiscal ground it is equally indefensible when applied to the colonies, as quite as injurious to the community. There are two articles of consumption, viz., sugar and timber, which the discriminating duties deserve especial notice. Sugar imported from the colonies pays a duty of 24 /.; from foreign countries, a duty of 35 1/2 /. The disproportion is so great, that foreign sugar is comparatively exportable from the consumption of our people, who are forced to reconcile themselves to the duties the colonies pay for the supply of that import. The population of the country has rapidly increased, and with it the demand for foreign consumption. It is painful to see the supply of sugar forcibly restrained by our commercial policy, that the consumption has not increased for ten years. In 1837, sugar imports were amounted to only 5,354,832 cwts. In 1840 it had sunk so low as 2,214,764 cwts. During this period the consumption of coffee, cocoa, and tea has considerably increased, and the people must therefore have suffered a serious privation on account of the limits put upon the supply of sugar, which is a monopole of the colonial monopoly; and the falling off of the price of the West Indies, in spite of an increasing demand is not the only proof that they have not gained even their protection: meanwhile the revenue has lost considerable sums by the exchange, with moderate duties, might be imported at a low and unlimited quantities.

The discriminating duties upon timber have been a species of monopoly, in so far as they have prevented the consumption of home wood, whether it have conferred any benefit upon the colonies. They have acted as a bounty of 45 /., the tax being levied upon the timber both in the country and upon foreign timber. On the 10th October, 1842, the duty on foreign timber will be reduced from 53 /., to 30 /., and on the 10th October, 1843, to 25 /. The colonial timber is, at the same time, to be reduced to 10 /., or 12 /. Eventually therefore the disproportion only 21/ 6. the load, instead of 45 /.

Export Duties

We have thus spoken of taxes upon such commodities only as are consumed by the subjects of the state whose benefit they are imposed, and which are embroiled within the country or imported into it. In levied upon goods exported to foreign countries is eminently paid by the foreign consumer, and thus beneficial to another state, the export duties are the effect of another. However desirable this may appear at present, whose treasury is enriched at the expense of other foreigners, the inexpediency of such duties will depend upon the peculiar circumstances, and great mischiefs inconvenience of the state. They must be regulated by the means, and that the commercial processes within some produce or manufacture must be inquired into as much as for the production of which it has peculiar advantage and moderate export duty may be very desirable. I manner Russian, which has almost a monopoly of the supply of tallow to the rest of Europe, derives a con
able revenue from an export duty upon that article. Upon
the same principle a duty upon machinery exported from
Great Britain would have been politic. British machinists
far excelled all others in skill and ingenuity, and foreign
manufacturers were willing to pay almost any price for
their machinery. Notwithstanding the prohibition, large
quantities have been smuggled abroad at an enormous
cost, but the difficulty and expense of evasion have been
so great that foreign manufacturers have largely confined
their purchases, in this country, to models and drawings, and
have made the machinery themselves, with the assistance
of British artisans, whom they have enticed abroad by ex-
travagant wages. (Reports of Committees of the House of
Commons on the Exportation of Machinery, 1841.) If, instead
of prohibiting the export, a duty of 75 or 10 per cent. ad
valorem had been imposed, foreign manufacturers would
have paid much less for the machinery purchased by them
in England than they could have had it made for abroad;
there would have been a large export trade from this
country, and a considerable revenue. The partial relaxa-
tion of the prohibitory law in 1825, by granting licences
to export certain kinds of machinery, has shown the extent
of which the trade might have been carried under a more
liberal policy. The official value of machinery exported
under licence in 1840 was £33,064., in addition to various
tools allowed by law to be exported, of which no account
was taken. (Report of Select Committee, 1841, No. 1.)
On the same grounds a moderate duty on the export of
coal, being a product peculiarly abundant and of good
quality in this country, is a legitimate tax, which would be
paid by the foreigner, and, if sufficiently moderate, would
not injure us in our competition abroad.

But while moderate export duties upon articles of which
a country has almost the exclusive supply may be advisa-
ble, heavy duties will check the demand abroad in the same
manner as they have checked the consumption of com-
mmodities at home. In the same manner also they are injurious to trade and unprofitable to the
revenue.

All duties whatever should be avoided upon the export of
the manufactures which they be also sent from other
countries to the same markets. They would discourage
trade and offer a premium to foreign competition.

Although the temptation is great to shift taxes from one
country to another by means of export duties, this tempta-
tion is equally great in all countries; and if their several
governments should be actuated by the desire to make
foreigners contribute to their revenue, their opportunities
for carrying out such a system would probably be equal,
and thus retaliations might be made upon each other, which
would injure the foreigner, and leave them in the same position as if they had been contented to tax none but their own subjects.

In this power of retaliation lies the antidote to the evil of one country forfearing to contribute to another, as well as its own. Every state would naturally resist such
an imposition upon its subjects, and export duties can therefore only be safely resorted to in such peculiar cases
as we have noticed, where foreigners are willing to pay an
increased price for commodities which they must have, and which they cannot obtain so good or so cheap from
any other place.

CUSTOMS; EXCHEquer; LAND Tax; POST-Office; STAMPS;
TAXES; TithES: WAREHOUSEINg SYSTEM.
ton, promised him a tenth of the moveables not only of the clergy, but of the laity. In this proceeding there appeared to have been a twofold peculiarity. First, a temporal prince offered the pope a contribution from his clergy, which commonly originated with the pope; and secondly, a tax was to be levied upon the laity not for the service of the state, but for the benefit of a foreign ecclesiastical. The strangeness of the circumstances however did not prevent the pope from taking immediate advantage of the king's offer, and he accordingly sent a legate into England to collect the sums the king demanded. It was the pope's intention, indeed, chiefly from the barons, but the pope and the king together were too powerful to be resisted. The legate, to shorten the work of collection, obliged the bishops to pay the tax for their inferior clergy; and when any of them were persuaded they had no revenue to pay money, he endeavoured to certain Italian usurers whom he had brought with him for that purpose, who lent them the sums demanded at an exorbitant rate of interest. (Matthew Paris, p. 362.)

In the same reign the pope's legates were constantly demanding presents from the bishops, monasteries, and clergy, and convening assemblies of the church with no other object than to extort money. Their proceedings created such distress that the great barons sent orders to the bishop of Lincoln to order him to refuse his bishops the right of appealing to the bull or mandates from Rome, and at last succeeded in driving the legate himself out of the kingdom. (Matthew Paris, p. 693.) Little good however was effected by these measures, for we find that in 1240 the pope demanded the half of all the goods of the non-resident and the clergy of the third of those who resided. (Ibid., 708.) The resistance met with in this case deterred the pope from enforcing his demand; but the sums which he continued to draw from the clergy were enormous, and the histories of that period are full of complaints and remonstrances against papal exactions. An act was passed by the parliament in 1297 (Statute of Carlisle, 55 Edward I.), to restrain, in some measure, the exactions of Rome, and to proceed well with, but not too good results; for seventy years afterwards we find the Commons in parliament still protesting against the exactions of the pope. In their remonstrance to the king upon that grievance they asserted, that the taxes paid to the pope yearly, out of England, amounted to five times as much as the taxes paid to the king.' (Cotton's 'Abridge-ment,' p. 128.)

Although complaints continued long after this period, no legislation was enacted in the limited or in the actual demands of the court of Rome until the pope's authority was altogether suppressed in England at the Reformation in the reign of Henry VIII.

2. The impositions claimed by the church were not only direct, but protecting its revenues from being laid under contribution for the service of the state. The kings of England, sometimes by the pope's authority, sometimes by force or voluntary compliance on the part of the church, and sometimes by their own direct power, obtained large sums from the clergy.

William the Conqueror found the church very wealthy, and subjected it to much spoliation. (Matthew Paris, p. 5.) A singular occasion for taxing the clergy arose in the reign of Henry II., A. D. 1129. An ecclesiastical council, assembled at London, denounced all married clergy, and decreed that they should put away their wives. The council committed to the king the execution of their decrees, but he, instead of compelling the clergy to do away with their wives, implored those who chose to retain them, which is said to have been very productive.

The pope was not unwilling to assist in oppressing the clergy for the benefit of kings, when they were inclined to forsake their electors, either from unwise caprice or carrying on wars against his enemies, or making conquests to him. He could not suffer the immunities of the church to be infringed by the temporal power, but often placed at the disposal of the king the revenues of the church by his own authority. Thus the pope, by virtue of his apostolical power, granted King Henry III., by several bulls, the goods of all clergy who died intestate, the revenues of all vacant benefices, and of all non-residents. In 1233 Pope Innocent XXII. gave the first-fruits and tenths of all ecclesiastical benefices to the king for three years. This grant made a valuation or taxation of the benefits necessary, which was accordingly undertaken the following year, and is sometimes called the 'New Taxation,' and sometimes 'Pope Innocent's Value.' The same prince, with the pope's concurrence, extorted from sums from the clergy in 1255 to carry on his wars against the Scotch. The same crown, in 1288, was drawn upon all the bishops, abbots, and principal clergy of the kingdom by Walleran, bishop of Berne, who resided at Rome as an agent for the church at that time, and obtained of the clergy a sum of £1,000, who, it was pretended, had already advanced the money for the Sicilian war. All resistance on the part of the church to these unjust demands of their own spiritual superior was unavailing, and after much remonstrance and money, he was forbad to them at their full value, a taxation by the king's prerogative.

In 1288 Pope Nicholas IV. granted the tenth to King Edward I. for six years, towards defraying the expenses of an expedition to the Holy Land; and in order to collect them at their full value, a taxation by the king's prerogative was begun in that year, and finished, as to the province of Canterbury, in 1291, and as to that of York in the following year, the whole being under the direction of the bishops of Winchester and Lincoln. This taxation was a monotonous process of exacting the tenth from the church, as well as to the kings of England as to the pope; they were afterwards regulated by it until the survey made by Henry VIII. and because the statutes of colleges which were found in the Exchequer, for the first time to vote him supplies from their own body. In the succeeding period, the pope had levied a tax of half the revenues of the clergy; but he thought it prudent to obtain their consent to his demands in a more regular manner. The clergy however would not obey the king's writ of summons, lest they should be required to acknowledge the temporal position; and in order to overcome this objection, the king issued his writ to the archbishop, who, as their spiritual superior, summoned the clergy to meet in convocation. (Gilbert's 'History of the Exchequer,' p. 61; Fleta, vol. ii. p. 184; Record Commissioners, 4th ser. vol. ii. p. 188.)

This was the commencement of the constitutional practice of the clergy meeting in Convocation at the same time as the Lay Parliament, and voting subsidies by its own voluntary act for the service of the state. It was not viewed by the king with alarm by the ecclesiastical dignitaries; and in order to put a stop to all such exactions of princes from the clergy, Pope Boniface VIII. issued a bull in 1236, which, after stating that temporal princes were in the habit of extorting heavy contributions from ecclesiastical persons, who, fearing to offend temporal power more than the eternal, had unwisely acquiesced in such extortions, proceeded to forbid churchmen of every degree to pay any tribute, subsidy, or gift to laymen, without authority from the see of Rome; and declared that if they should pay, or promise, or even observe any one assent in levying such unauthorised taxes, all such persons respectively would incur the sentence of excommunication. (Rymer's 'Fleta,' vol. i., part 2, p. 836; Record Commissioners, 4th ser. vol. ii. p. 188.)

In the same year however Edward I. demanded of the clergy a fifth of their moveables, which they resisted on the ground that they could not disobey the pope: but the king was not inclined to desist; and in order to force the clergy to accede to his demands, he made the restating of the laws. Orders were issued to the judges to cause the cause brought before them by the clergy, but to decide all causes in which they were sued by others. The clergy were immediately exposed to violence and spoliations, either as a result of the pope's authority, or as the consequence pronounced by the archbishop against all persons who should attack the persons or property of ecclesiastics. The clergy could not long resist these oppressions; and although they were unwilling to disobey the Papal bull, they did not by voluntarily depositing a sum equivalent to the amount
These include all the local taxes of which any account can be given, but there are still many others, such as rates for paving, lighting, and watching particular cities and towns, and for other municipal purposes. It may also be added that the tithe of Great Britain and Ireland amount to 4,000,000L.

It is instructive to compare the present amount of taxes with that rendered necessary by a war expenditure. From 1805 to 1810 the payments into the British exchequer from taxes and loans in no one year amounted to less than 100,000,000L, and in 1813 rose to the enormous and scarcely credible sum of 176,346,023L.

The total amount of all state and provincial or county commune taxes amounted in 1841 to 2,020,000L, upon a population of 2,100,000.

### Sweden
- The state taxes amount to £753,404
- Provincial:
  - 522,720
- Municipal—Stockholm: 24,035
- All other towns: 50,675
- Total: £1,354,834

### Kingdom of the Netherlands
- Total: £1,354,834

### France
- Direct contributions for the state: £1,143,304
- For the provinces: 2,473,151
- For the communes: 217,018
- Total: £1,942,184

### Denmark
- Indirect taxes for the state: £20,544,235
- Miscellaneous items: 453,738
- Other sources of revenue: 565,190
- General total: £24,429,725

### Saxony
- The state taxes are: £534,445
- Direct: 1,085,364
- Indirect: 1,700,610
- Total: £2,075,974

### Bavaria
- Direct state taxes: £11,407
- Indirect: 665,119
- Which, with other sources of income, produce a revenue of 2,502,039

### Sardinia
- State taxes:
  - Direct: £500,264
  - Indirect: 1,000,000
- Total: £1,500,264

### Rome (Papal States)
- State taxes:
  - Direct: £497,413
  - Indirect and Miscellaneous: 1,261,989

### Kingdom of Naples and Sicily
- State taxes (exclusive of Sicily): £3,904,957
  - Municipal taxes: 155,267
  - Total: £4,160,224

### Kingdom of Naples and Sicily, Sicily:
- Direct state taxes: £2,922,900
- Indirect: 630,634
- Total: £3,553,534

### Naples
- Municipal taxes: £1,363,212

### Tax Assessment

<table>
<thead>
<tr>
<th>Class of Property</th>
<th>Gross Receipt</th>
<th>Rate per cent. at which assessed</th>
<th>£</th>
<th>£ s. d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customs</td>
<td>23,821,480</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Excise</td>
<td>15,477,674</td>
<td>6</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Stamps</td>
<td>7,494,299</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Tax on Assessed, &amp;c.</td>
<td>4,270,457</td>
<td>4</td>
<td>2</td>
<td>9</td>
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<tr>
<td>Post-Office</td>
<td>1,539,274</td>
<td>60</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Duties on Pensions and Salaries</td>
<td>5,752</td>
<td>1</td>
<td>17</td>
<td>6</td>
</tr>
<tr>
<td>Crown Lands</td>
<td>438,287</td>
<td>8</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>Small branches of hereditary revenue</td>
<td>5,562</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surplus fees of public offices</td>
<td>93,504</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total ordinary revenues</strong></td>
<td>53,566,250</td>
<td>6</td>
<td>13</td>
<td>8</td>
</tr>
</tbody>
</table>

To these parliamentary taxes may be added the following local assessments:
- **Poor-rates**: £6,351,828 (which includes county rates, 700,000)
- **Church-rates**: 600,000 (in round numbers)
- **Highway-rates**: 1,912,812
- **Tunbridge-wells (England and Wales)**: 1,977,764
- **Grand-jury presentations (Ireland)**: 1,285,986
- **Total of local taxes**: 11,080,270

(Parliamentary Papers, 1839 (562), 1841 (344) (421), 1842 (385) (295))
Further interesting particulars concerning the several
taxes of European States will be found in the Parlia-
mentary Paper, No. 227, of 1842, ordered by the House of
Commons, 3d May, 1842.
TAXODIUM, from taxus, the name of a genus of
plants belonging to the natural order Coniferae. The
plants of this genus are知道 monocious; the perianth of the barren flowers is single
at the base, and the stamens are 6-8-celled; the cells opening
beneath. The female flowers have a single, urceolate, scale perianth; no style,
and a fleshy drupaceous fruit, perforated at the extremity.
The species of this genus are evergreen trees, with nume-
rous, persistent, pin-like, male leaves, and, in rare, entire
leaves. They are natives of Europe and North America.
T. buxifolia, Common Yew, has its leaves 2-ranked,
crowded, linear, flat, with the flowers axillary, sessile; the
perianth of the barrens flowers globular. This variety of yew is well known: it is indigenous to most parts of Eu-
rope, and is found in every part of Britain and Ireland. It
is seldom seen growing in company with its own species,
but alone, or with other species of plants.
The yew is a low tree, the trunk rising three or four
feet from the ground, and sending out numerous
spreading branches, forming a head of dense foliage, which,
when full grown, may be sometimes 30 or 40 feet high.
It is of slow growth, attaining under favourable circum-
stances, eight feet in twenty years. The tallest yew in England is in the
churchyard at Harlington, near Hounslow, which is 80
feet high. A tree continues growing for about one hun-
dred years, but is not, in its later life, of much use.
The yew-trees at present exist at Fountain's Abbey in Yorkshire are supposed to have
attained their full growth when the abbey was erected
1132.
These remarkable characters and properties of the yew
have drawn towards it at all times much attention. Do-
scordes, Pliny, and Theophrastus mention its poison-
ous properties. Caesar (Bell. Gall., vi. 31) relates that Carac-
thus, king of the Eburovnes, committed suicide by swallowing
the juice of the yew-tree in various parts of Great Britain, and many fine specimens are now to be
found.
In its native districts in North America it is exceedingly abundant, and in many parts, as in Louisiana, it
takes possession of acres of the low grounds, which are called cypress, or cypress swamps.
It is found in Delaware, on the banks of the Indian River, in 38° 50' N. lat., which is its northern boundary, and, pro-
ceeding southward, it is abundant in the swamps of Vir-
ginia, the Carolinas, Georgia, and Florida, where the
quality is an object. In Louisiana it is used for making
the masts and sides of vessels, and also canoes, which are
fashioned out of a single trunk, and are said to be more
durable than when made from any other wood. The bark
of the tree exudes a resin of an agreeable colour and a red
colour which is used by the negroes for dressing
wounds, but it cannot be obtained in sufficient quantities to con-
stitute an article of commerce. The roots of this tree are
remarkable for the production of knots or protruberances,
which are sometimes five or six, and, according to some
observers, many more feet in circumference. They have
generally a conical form, and are hollow inside, with a
covering of red bark, similar to that of the roots. In
America, they are called cypress knees, and are used by the
negroes for bee-hives.
In the cultivation of the deciduous cypress, a rich moist
soil must be selected in a low situation. It may be in-
creased by seeds from the imported cones, or it may be
propagated by cuttings, planted in autumn in a moist
sand or heath soil, situated in a shady damp place. Lay-
ers also, when put down in moist soil, will root freely the first
year.

During cultivation, this tree is exceedingly prone to
torto, so that no two individuals have precisely the same
appearance. On this account, a number of varieties have
been named. The most common is the T. d. patens, which
has horizontal branches. Another, with pendulous branches,
is known as T. d. pendulum; a third, with pendulous first
year's shoots, as T. d. mutans. Other species of the genus
have been described, but are not yet used or cultivated.
For further information on this genus, see Loudon's 'Abo,
et Fruit.,' vol. iv.
TAY 171 TAY

there is seen at the present day. Although the fruit of the yew is not poisonous, there are many well-authenticated instances of the leaves producing death. Deer and goats are said to feed upon them with impunity, but to cows and horses they prove an active poison. The yew has not been at any time used as a beverage, and indeed it would be unlikely that its effects on the system have been represented so generally as to those of digitalis, and as being more manageable and less liable to accumulate in the system than the quassia. It is a true inference that the student of comparing the effects of which the yew is said to have sheltered the monks whilst that magnificent pile was erecting. The Tytherton, Fortingal, Arlington, and Loch-Lomond yews are remarkable for their size and age. Many of them, if we estimate their age in the modes proposed by Dr. Candolle, must exceed considerably a thousand years.

The wood of the yew is used extensively in cabinet-making. It is very hard, compact, and of a fine close grain, which arises from the smallness of its annual layers, 20 being sometimes found in a piece not more than 20 inches in diameter. It is also much used by the turner for making snuff-boxes, musical instruments, &c.

There are several varieties of the common yew; the most remarkable of these, are delineated by Dr. Lindley. He has made a distinct species, T. fastigiata. It is distinguished by its upright mode of growth, and by its leaves not being arranged in ranks, but scattered. It was first discovered on the sea-cliffs at Fortingal, in Ross-shire, and has since been observed in other parts of Ireland. Other varieties are described, produced by difference in cultivation, soil, &c. The Canada or North American yew is described as a species, T. Canadenisis.

In the cultivation of the yew, a moist soil should always be selected; but it thrives best on clays and loams, on rocks, and in shady places. It is best propagated by seeds, which, if sown as soon as they are gathered in autumn, surrounded by the pulp of the fruit, will come up the next or following spring; but if dried, will not come up till the third year. Where the object is to form a fence, cuttings may be employed. Before transplanting, whether they be raised from seeds or cuttings, the plants should be three years of age.

For further information concerning the yew, see Loudon's Arboretum et Fruticetum Britannicum.

TAY. River. [PERTHSHIRE.]

TAY. LOCH. [PERTHSHIRE.]

TAYTON. Before the commissioners. TAYLOR, ROWLAND, LL.D., was a clergyman eminent for his learning and piety, who was buried at the stake in the reign of Queen Mary. He is said by Bishop Heber to have been an ancestor of Jeremy Taylor. He was chaplain to Archbishop Cranmer, by whom he was appointed rector of Hadleigh, in Suffolk, where he went to reside.

Dr. Taylor was summoned, in the year 1555, to appear before Gardiner, bishop of Winchester, and Particular Committee of the House of Commons, at his command to answer the charges of which Dr. Taylor was accused in his marriage; but he defended the right of priests to marry with so much learning, that no sentence of divorce was pronounced, though he was deprived of his benefice. At the end of January the prisoners were again brought before the commissioners, by whom they were sentenced to death. Dr. Taylor was committed to the Poultry Compter, where, on the 4th of February, he was

visited by Bonner, bishop of London, who went there for the purpose of making him put on the dress of a Roman Catholic priest. Dr. Taylor resisted with his usual courage, and the dress was put upon him by force; he treated the whole proceeding with the utmost contempt, as a piece of monstrous and horrid mockery, and if he had been an Indian croiser if he had not been restrained by his chaplain.

On the following day the procession set forth which was to conduct him to the place of execution. In the course of the procession, aroused by the sheriff and others to induce him to recant, but without making the smallest impression upon him. The procession passed through Hadleigh, where he was consoled and cheered by the blessings and prayers of his parishioners. The execution took place at the bottom of the hill called Alidham Common, near Hadleigh. A stone, with the following inscription, perhaps still remains to mark the spot:—

"1555. Dr. Taylor in defending that was gote at this plas left his bide."

Bishop Heber, in his 'Life of Bishop Jeremy Taylor,' says, 'There is nothing indeed more beautiful in the whole beautiful Book of Martyrs than the account which Fox has given of Rowland Taylor, whether in the discharge of his parochial duty or in the more serious moments when he was called on to bear his cross in the cause of religion. His warmth of heart, his simplicity of manners, the total absence of the false simulants of enthusiasm or pride, and the abundant overflow of better and holier feeling, is so much the contrast of this cold world, that the buoyant cheerfulness with which he encountered it, with a spirit only inferior to the eloquence and dignity of the "Phaedon."'

(Fox's Acta et Monuments.)

TAYLOR JEREMY, was born at Cambridge in 1613, where he was baptized on the 15th August in that year.

His ancestors had been wealthy and respectable, one of whom, Dr. Rowland Taylor, is mentioned in Fox's 'Book of Martyrs' as bringing upon himself the displeasure of the popish party in the reign of Mary, not only by the popularity of his character and talents, but also his wealth. Taylor's father was a barber, a calling generally united in those days with surgery. At an early age Taylor was sent to Pusey's grammar-school in Cambridge, and in his fourteenth year he was entered at Caius College as a sizar, an order of students which Bishop Heber informs us, were then what the 'servitors' still continue to be in some colleges in Oxford, and what the 'lay brethren' are in the convents of the Romish church. At little more than twenty years of age, having taken the degree of master of arts, and been admitted to holy orders, he attracted the notice of Laud, then archbishop of Canterbury, before whom he was examined as a candidate for the bishopric. With the flattery of Laud appreciated his eloquence and his talents, which he encouraged in the most judicious manner by having him settled at Oxford, where he was admitted to the degree of Master of arts, and appeared in the successful interpretation of the archbishop, in 1636, nominated to a fellowship. Taylor does not appear to have remained long or uninterruptedly at Oxford. In 1637-8 he was presented by Juxon, bishop of London, to the rectory of Uppingham in Rutlandshire. About this time an acquaintance which, in common with Laud, he maintained with a learned Franciscan friar, Francis à Sanctis Clara, exposed him to the suspicion of a concealed attachment to the Roman church—a suspicion to which the character of his mind, which tended to excuse him in religion, and his remarkable aptitude for antiquity, and which cherished a love of the gorgeous and imposing in the ceremonial of worship, gave some plausibility. At a later period in life however Taylor solemnly denied that there had ever been any soil ground for questioning the sincerity of his Protestantism.

In the civil wars he followed the fortunes of Charles, whose chaplain he was, and in 1642, when the king was at Oxford, he published there his 'Episcopacy asserted against the Arian Popish Atheists.' This, though a small book, he sought to maintain a cause that had then however, unfortunately, passed from the controversy of the pen to that of arms. Charles rewarded Taylor in the only way in which it remained for him to do so: he obtained for him admission to the degree of doctor of divinity. This honour was diminished by the indiscriminate manner in which it was conferred upon many other loyalists at the same time, so as to provoke an expression of dissatisfaction from the

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heads of the University; and its advantages were overbalanced by the loss which Taylor encountered in the same year, in the sequestration of his rectory of Uppingham by the parliament. In 1647, with the onset of the civil war, he published his discourse, 'The Liberty of Prophesying.' After the defeat of the royalists Taylor was repeatedly imprisoned, but only for short periods. During the first years of the protectorate he supported himself by keeping an inn in Lincoln, and afterwards by lecturing in London, where he resided till 1663. In 1663, he moved to Cambridge, was elected a fellow of King's College, and subsequently of St. John's, and became a prebendary of Ely. He was appointed chaplain in the household of Queen Henrietta Maria, and was rewarded in 1666 with the appointment of Ductor of King's College. In 1671, he became Master of the Charity School at Gipsy Hill, where he died in 1711.

Taylor was a man of钜ous literary ability. He was an accurate and skillful printer; and his work as a printer was particularly useful, for it was in this way that his writings were first brought to a wide readership. He was a man of wide learning, and his works are characterized by a rich and varied vocabulary. He was a man of deep piety, and his works are often infused with a profound sense of the sacredness of divine truth. He was a man of great charity, and his works are often characterized by a sense of the importance of the good of others.

Taylor was a man of great eloquence, and his works are often characterized by a powerful and persuasive style. He was a man of great wisdom, and his works are often characterized by a deep understanding of the complexities of human nature.

In conclusion, Taylor was a man of great literary ability, a man of deep piety, a man of great charity, a man of great eloquence, and a man of great wisdom. His works are a testimony to the power of the human mind, and to the importance of the wise and charitable use of that mind.
ing. A very good sketch of it will be found in the third volume of Mr. Hallam's "Introduction to the Literature of Europe," and a more detailed one in the first volume of Heber's edition of Taylor's works. But the discourse itself is not long, and will well repay the reading. It considerably clarifies the task to which the writer has submitted himself, and which he afterw..ords assigned for its publication. 'In the dedication of the work, the author intimated that he intended to connect this production of Taylor with the man, his order, and the times, when we take into account the motives which he afterwards assigned for its publication. 'The dedication also contains the account of his having been requested by the Privy Council to write a piece upon the subject of the laws of God and our superiors.' (Hallam, "Introduction to the Literature of Europe," vol. iii., p. 118.)

The Bishop had vindicated Taylor from the charge of transgression, founded not upon the above testimony which Taylor himself furnishes, but upon the character of his proceedings when episcope was restored. If we must allow in reference to his Sermon preached before the Irish Privy Council, that the obedience which he there insists upon is not, as Bishop Heber supposed, the adherence of a private citizen which is paid by the members (clergy) of his own communion; and that it is in fact no more than the privilege (which every Christian society exercises and must exert for its own preservation) to have the effectual operation of the law of nature, as well as the law of grace, to the regulation imposed by the body at large on those to whom its powers are delegated; we ought to add that this distinction is left in much ambiguity; that principles are mentioned with a much more general signification than we might suppose, and that the argument, as it were coming out of a hundred readers the sermon before the Irish Privy Council would produce impressions totally inconsonant with those derived from the 'Discourse on the Liberty of Conscience.' In something arbitrary and loose in arguing the horrid mischief which come from rebellion and disobedience, and his hopes of better things, the bishop of Down and Connor proceeds in his sermon before the Privy Council to say that he sees no objection against his hopes but that which ought least of all in this case to be pretended: we pretend conscience against obedience, expressly against St. Paul's doctrine teaching us to obey for conscience sake; but to disobey for conscience in a thing indifferent is never to be found in the books of our religion. It is very hard to say to his reader what he himself said as God did to his stubborn people, 'Quid faciam tibi?' 'I have tried all the ways I can to bring thee home, and what shall I now do unto thee?' The subject should rather say, 'Quid faciam tibi? Why art thou gone from me?' This question is the best end of disputations. 'Corruptaque dissipatissimus officium, si quis ad id good faceret jussus est, non obsecro debito, sed consilio non consideravo, respondet,' said one in A. Gillius: 'When a subject is commanded to obey, and he dispute, and says, 'Nay, but the other is better,' he is like a servant that has to master's necessary counsel when he requires of him a necessary obedience. 'Utile parere edictum quam effere calamitatem; he had better obey than give counsel; by how much it is better to be prudent than to be witty, to be full of goodness rather than full of talk and argument.' Rather on, in the same sermon, he distinguishes between 'tender conscience,' which is such in reference to age or person, and the conscience of a man who is not to be answered by any words, not usages, unless they prove ineffectual, and that the issue may be necessary.'

Mr. Hallam refers to the 'Doctor Dubitantium' as the most instructive, the most learned work of the Bishop, published in the English language. 'As its title shows, it treat of subjective morality, or the guidance of the conscience. But this cannot be much discussed without estab...hing some principles of objective right and wrong; hence it contains a piece of moral theology in the true sense. The whole measure and rule of conscience,' according to Taylor, 'is the law of God, or God's will signified to us by nature or revelation; and by the several manners and times and parts of its communication it hath obtained sev..eral names: the law of nature, the consent of nations, right reason, the Decalogue, the sermon of Christ, the canons of the apostles, the laws ecclesiastical and civil of princes and governors, expressed by proverbs and other testimonies.' He would have us believe that the full measures of right and wrong, of lawful and unlawful, will be the rule of conscience and the subject of the present book.' The heterogeneous combination of elements in this work, so different in nature and authority, as if they were all expressions of the same kind of God, does not, according to the distinctness of Taylor's moral philosophy, and would be disadvantageously. compared with the Ecclesiastical Polity of Hooker. Nor are we deceived in the anticipations we look for of Taylor's philosophy of nature, his doctrine of fertility, and his frequent acutenes..e, the 'Doctor Dubitantium' exhibits his characteristic defects: the waste of quotations is even greater than in his other writings, and his own exuberance of mind degenerates into an intolerable prolixity. His solution of moral difficulties is often unsatisfactory; after an accumulation of argument and authorities we have the disappointment to perceive that the knot is neither untied nor cut; there seems a want of necessary principles, a frequent confusion and obscurity, which Taylor occasionally displays in his exposition, and we are left in the dark. In maintaining against most of the scholastic metaphysicians that God can dispense with the precepts of the De..calogue, he may be substantially right, yet his reasons seem by no means the clearest and most satisfactory that might be assigned. He says, it may be added, that in his proximate rules concerning what he calls a probable conscience, he comes very near to the much-decried theories of the J...suits. There was indeed a vein of subtlety in Taylor's understanding which was not always without influence on the conduct of the times.

Bishop Heber has also remarked on some of Taylor's positions to the same effect; instancing his admission that it might be the authority of public opinion to decide that which was right. His theory of necessity; his justification on moral grounds of the supposed fraud of the children of Israel in borrowing jewels of the Egyptians without any intention of restoring them. 'In the first chapter of the third book, which treats of human laws and their obligations, a case occurs in illustr...ation of Rule iv., that a law founded on a false presupposition does not bind the conscience,' in which the Romish canonists seem to have given a more just decision than Taylor. Biretti, a Venetian gentleman, pretends a desire to marry Julia Medici, the daughter of a neighbour, with a purpose to seduce and desert her. A contract is mad...e; but before its execution he gains his end, and leaving her, marries another. The canonists declare the contract null and void, because the woman was brought to him by force, and that he is bound to return to Julia. 'No,' says Taylor, 'if he did not lie with her, 'affectu maritale,' he was extremely impious and unjust; but he made no marriage; for without actual consent marriages are not made.' To these illustrations, added by Heber, may be added another, referred to elsewhere: Rule xi., 484, he maintains the right of using arguments and authorities in controversy which we do not believe to be valid; a rule which he appears to be willing to extend. In the "Defence of Episcopacy," published in 1642, he main...tains the authenticity of the first fifty of the apostolic canons, all of which, in the "Liberty of Prophesying," a very few years afterwards, he indiscriminately rejects.' (Hallam.)

On devotional subjects the character of Taylor's mind fitted him to write with most success. In these we find his most glowing language, his aptest illustrations; and
'whether he describes the duties, or dangers, or hopes of man, or the mercy, power, and justice of the Most High; whether he exhorts or instructs his brethren, or offers up his supplications in their behalf to the common Father of all, his conceptions, and his expressions belong to the loftiest and most sacred description of poetry, of which they only want what they cannot be said to need, the name and the metrical arrangement.' (Heber, Life and Works of Jeremy Taylor, 15 vols., 1820-22.)

The Water-Poet, by the title, which he seems to have given to himself, of The Water-Poet (The King’s Majesty’s Water-Poet), was born in the city of Gloucester in the year 1580. His education was limited, for he himself informed us that he travelled in the Accentuates and could get no farther. He came to London, and was bound apprentice to a waterman, an occupation from which he derived his title of Water-Poet, and which afforded him the means of subsistence during a great part of his life. He had however for fifteen or sixteen years some situation in the Tower of London; and he afterwards kept a public-house in Phoenix-Alley, Long Acre. Being an enthusiastic royalist, when Charles I. was beheaded he hung up the sign of the Mourning Crown, which he was compelled to take down, and he then supplied its place by a portrait of himself, with the following couplet under it:

"There’s many a king’s head hung’d up for a sign, / But never was there one of such a kind:

Taylor was not satisfied with the distinction which his literary productions procured for him: he was fond of fixing public attention by other extraordinary performances. He once undertook to sail from London to Rochesters in one pamphlet of paper, having made his way into his boat before he reached his destination, and he had some difficulty to get safe ashore. A journey which he performed by land is described in one of his tracts, entitled ‘The Pennyless Pilgrimage, or the Moneyless Perambulation of John Taylor, alias the King’s Majesty’s Water-Poet; how he travelled on foot from London to Edinburgh in Scotland, not carrying any money to or fro, neither begging, borrowing, or asking meat, or lodging.’ He left ‘the Bell Inn that’s extra Aldergate’ on his left hand, and at a fall of the moon was abstracted from Taylor’s pamphlet, in the ‘Penny Magazine,’ Nos. 622 and 623. He was attended by a servant with a horse, and they had a small stock of provisions andprovender, which more than once relieved them when the occasional inhospitality which they met with had reduced them to the extremity of hunger. His course was through St. Albans, Stony Stratford, Coventry, Lichfield, Newcastle-under-Lyne, Manchester, Preston, Lancaster, Carlisle, Edinburgh, Dunfermline, Stirling, Perth; and being then in the Highlands, he had an opportunity of seeing, at ‘the Brae o’ Mair,’ one of those great deer-hunts which were then frequent in that part of Scotland, and of which he gives in his pamphlet an entertaining and picturesque description. The whole journey till his return to London occupied about three months. But a sort of voyage which he afterwards performed was apparently not less difficult. He published, as usual, an account of it himself, ‘John Taylor’s Last Voyage and Adventure, performed from the 20th of July last, 1641, to the 10th of September following; in which time he passed with a sculler’s boat from the city of London to the cities and towns of Oxford, Gloucester, Shrewsbury, Bristol, Bath, Montgomery, Hereford.’ The title itself might be supposed that he went all the way by water, a feat which, seeing the course of the rivers, and the want of canals in those days, was an obvious impossibility; but the fact is, that when a river ceased to be navigable, or ran in a wrong direction, he shipped his boat and himself in a wain or waggon, and voyaged by land till he came to another river which suited his purpose: still a great part of the voyage was performed by water, and thus, to use the phrase of a less useful than 1200 miles were passed to and fro, in most hard, difficult, and many dangerous passages.

Taylor died in 1644, in his 75th year, and was buried in the churchyard of St. Mary’s church in London. His publications, which amount to upwards of eighty, are some in prose, some in verse, and many both in prose and verse. As literary productions they are of little or no value, the verses were dogget, and the prose such as might be expected from a writer not without observation, but of no great power of mind, and almost entirely uneducated. Still they are by no means without their value. Nearly all of them having short occasional productions arising out of the circumstances in which he was placed, they afford many curious descriptions, as well as interesting glimpses of the opinions and manners and general state of society of the times in which he lived. Sir Egerton Brydges, in his ‘Censure Litteraria,’ has given a full list of Taylor’s pamphlets; probably no copious one is also given in Watts’ Bibliotheca Britannica.

(Baker’s Biographia Dramatica, by Reed and Jones, in which work he has obtained a place in consequence of being a sage, ‘Triumphs of Fame and Honour,’ 4to., 1634.)

TAYLOR, SILAS, otherwise called Downville, or D’Onville, by Antony Wood, was the son of Sylvanus Taylor, one of the commissioners during the civil wars for ejecting those of the clergy called "scandalous ministers." Silas Taylor was born at Harley near Mach-Wenlock, in Shropshire, July 16, 1634, and after being educated at Shrewsbury and Westminster schools, became a commonomer of New Inn Hall at Oxford in 1641. He was much interested in the affairs of his country, and was in which he had a captain’s commission. After the war he was appointed by the interest of his father sequestrator of the royalists in Herefordshire, in discharge of which he has been enabled in the confusion of the civil wars to rummage the libraries of Hereford and Worcester cathedrals, and in the course of these researches is said to have discovered the original charter in which King Edgar asserts his claim to dominion over all the kings of England and the commonwealth of the world. ‘Mare Clausum,’ lib. ii. He left materials for a history of Herefordshire, which afterwards came into the hands of Sir Edward Harley of Brampton Brian in that county. To this collection belong Nos. 4046, 4174, 6728, 6742, 6856, and 6868 of the Harleian MSS., containing a general history with notes and special topographical information under the several parishes, extracts from ‘Domesday,’ Leiland, &c. From these papers Mr. W[illiam] Pitman, in his ‘History of Herefordshire,’ which is said to have borrowed largely. (Gough, Catalogue of Topographical Works, ‘Herefordshire.’) In the Shakespear MSS. is a paper of Taylor’s on the making of cider. (Avscough’s Catalogue, ‘Taylor.’)

His published works are, ‘The History of Gavelsland—’ with some observations and remarks upon many special occurrences of British and English history. To this is added a short history of William the Conqueror, written in Latin by an anonymous author in the time of Henry I. London, 1663, 4to.

A History of Harwich was published from his pamphlets by Samuel Dale, in 1730, and another edition, or the same with another title-page, London, 1732.

TAYLOR, JOHN; Taylor’s Theorem, is referring all matters connected with algebraical development to certain points. This was partly removed by the idea that so little was known of the discovery of that theorem, that the additional space required by our plan could not appear more than was due to the celebrity of the subject. We find ourselves however very far from adding to the number of definitions that two points, Taylor himself, and that of his theorem, are to be, and can be, recovered from the neglect into which they have fallen, at least in this country.
Nothing is said of Brook Taylor in the 'Biographia Britannica,' or Martin's 'BiographiaPhilosophica,' and Hutton, &c., give nothing but the date of his birth and death, entrance into college and the Royal Society. The Biography Universelle was the first work which gave any detail of his life, and this is due to the following circumstance.—In 1790, some members of the French Academy, struck with the scantiness of the existing information relative to so celebrated a man, requested Mr. William Howard, then Secretary from Sir W. Young, to write a life of him. This gentleman applied to Sir William Young, Brook Taylor's grandson, who accordingly drew up an account of his ancestor from family materials, and printed and circulated it privately. It is from this work that the following is taken, and he further abandoned the manuscript in 1792.

Brook Taylor was born at Edmonton, August 18, 1685, and was the son of John Taylor, of Bifrons House in Kent, by Olivia, daughter of Sir Nicholas Tempest, of Durham, Baronet. John Taylor was the son of Nathaniell, who, to use a phrase of his own diary, 'tugged and wrestled with the Lord in prayer,' and was member (elected by Cromwell's summons) for the county of Bedford in the (Barebones) parliament of 1653.

Brook Taylor's father was the eldest son of Nathaniell Taylor of the same, where, besides enough of the usual learning to enable him to begin residence at St John's, Cambridge, in 1701, he became excellent both in music and painting. His numerous family were generally proficient in music, but the dominating feature of the art was the painting. In a large family picture he is represented, at the age of thirteen, sitting in the centre of his brothers and sisters, the two elder of whom crown him with laurel branches. In the picture of the future writer on perspective are as not needing the allowance always made for amateurs, but as capable of bearing the closest scrutiny of artists. At Cambridge he applied himself to mathematics, and acquired early the note of Keil, Machin, and others. His first writing was on the centre of oscillation, in 1708, as appears by a letter to Keil (afterwards given in Phil. Trans., 1718, No. 337). In 1709 he took the degree of L.L.B., in 1714 that of L.L.D.; in 1715, in place of the Royal Society, as painter of the London Press, of Machin (preserved in his family), from 1709 to 1712, treat of various subjects: and, in particular, contain a solution of Kepler's problem. We may here conveniently put together a complete list of his works.

In the Philosophical Transactions, 1712 (No. 330), On the ascent of water between two glass planes; 1713 (No. 337), On the centre of oscillation; also on the motion of a vibrating string: in the same year, a paper on Music, not printed. 1713 (No. 344), Account of experimental researches on the law of the magnetic needle. 1717 (No. 352), Method of Approximation to the roots of equations; (No. 353) Appendix to Montfliant on infinite series; (No. 354) Solution of a problem proposed by the Royal Society to find the most advantageous pitch of a string to produce a given note. 1721 (No. 367), Propositions on the parabolic motion of projectiles; (No. 368) Experiments on magnetism. 1724 (No. 370), On the expansion of the thermometer. Besides these, the separate publications are: 1715, Methodus incrementorum directa et inversa. London. 1715, Linear perspective, or a new method of representing mechanical objects as they appear to the eye in all situations. London. 1719, New principles of Linear perspective, or the art of designing on a plane the representations of all sorts of objects in a more general and simple method than has been done before. London. A different work from the former: its second edition (called the third, by an obvious mistake) bears revised and corrected by John Colson, London, 1749. Joshua Kirby's well-known work, though called 'Taylor's perspective,' is not an edition of Taylor, but a new work on the subject.

* * * * *

Not published. ContemplatioPhilosophica, a posthumous work of the Rev. Brook Taylor, LL.D., F.R.S., sometime secretary of the Royal Society. Festschrift, in honor of the 350th year of his birth, by his grandson, John Taylor, P.R.S., A.B.S., with an appendix, containing many original papers, &c. The account of him given by Prony in the 'Encyclopédie Universelle' (1822) is, we are informed, derived from his W. Young, and was not noticed by Paris; with paraphrasical sentences inserted just before publication.

1 His grandson's biographical name was probably in memory of the noted painter, Lord Brook.

In January, 1714, he was chosen secretary of the Royal Society. In 1716 he visited his friends Montmort and Conti at Paris. He had just had a warm correspondence with the former on the Newtonian doctrine, and on the theories of Malebranche. His philosophical work, or rather tract, the 'Contemplatio Philosophica,' has been generalized, and brought up to date in his latest thoughts on the opinions of Malebranche and Leibnitz. In France he formed the acquaintance of Bishop Bossuet and Lord and Lady Bolingbroke, with all of whom he carried on a warm and extensive correspondence.

He returned to England in February, 1717; but his health was now impaired, and, throwing up the secretaryship in October, 1718, he retired to Aix-la-Chapelle. On returning to England early in 1718, he seemed to have recovered his health. He continued to write. Some of the papers of this period are essays on Jewish Sacrifices, and on the lawfulness of eating blood. At the end of 1720 he went to visit Lord Bolingbroke at La Source, near Orleans, and returned to London in the month of February. On the occasion of this year he wrote nothing for publication, nor could his grandson find anything of a mathematical character among his papers, with the exception of a reference to a treatise on logarithms, which it seems he had placed in the hands of his friend Lord Dartmouth (afterwards Lord Dartmouth) to prepare for the press, but which was never printed.

At the end of 1721 he married a young lady of small fortune, a circumstance which occasioned a rupture with his father. Some time after his marriage, and when there appeared hope of issue, his wife was on the point of death. In 1726 the birth of a son would probably accomplish a reconciliation between her husband and his father. On this she fixed her mind with such earnestness, that on finding herself again on the point of death she exclaimed, 'God has bestowed on me a child of joy': the infant also perished. This melancholy event led to the reconciliation the hope of which had caused it, but not till the autumn of 1723.

Dr. Taylor returned to his father's house, and in 1725, with his father's consent, purchased a neighboring estate, and in the same year to 1729 he succeeded to the family estate by the death of his father, and in the following year his wife died in giving birth to a daughter, afterwards the mother of the writer of the present memoir from which we have been quoting. Lord Bolingbroke, now settled again in England, endeavoured to divert the thoughts of his friend by inducing him to pass some time in his house, but in about a year after the stroke, Dr. Taylor died of decline (in London, we suppose), December 29, 1731, and was buried in the churchyard of St. Anne's, Soho. The family estate of Bifrons is still in the possession of the descendants of his brother Herbert.

We shall dismiss other points with brief notice, and as well known, in order to come to the history of the theorem: such are the celebrity of Taylor's solution of the problem of vibrating chords, the questions he proposed to the foreign mathematicians in the war of problems, his answer to the accusation of plagiarism brought against him by John Bernoulli, and his reply. With reference to the celebrated works on perspective, the first was mathematical, the second intended for artists who hardly knew anything of geometry. Bernoulli charged Taylor with having taken his method from another, and Prony states that it is in fact the one given by Guido Ubaldi, though he thinks Taylor could not have seen that method. The work referred to is Guido Ubaldi's 'Perspective.'

Pisani, 1691, which has nothing to do with the subject, is another translation of Ubaldi's work.

Nothing is more easy than assertion about old books, when Prony had really looked attentively at the works of Ubaldi and of Taylor together, he would have seen that whereas the former only introduced the use of vanishing points as to lines which are horizontal (the former being vertical), Taylor introduced the method of vanishing points for all lines whatsoever, and made them of universal application. We cannot think that he had never seen Ubaldi's work, which he has himself admitted, nor are we likely to be ignorant of so celebrated a production. He must have seen, and generalized, the method given by Ubaldi. If indeed any one between the two is asserted to have a claim, that claim, when proposed, must be disputed; but a glance at the work of Taylor convinced Bernoulli that Ubaldi was literally no more than a record of the fact that
the party accused and John Bernoulli had had a quarrel, while what relates to Ubaldi is only so far true in that Ubaldi used the particular and Taylor the general method. It is not credible that Ubaldi was ignorant of the general proposition, or if he were so, Stevinus (whose *Scioraphia* was published in 1688) was not;* but Stevinus did not see any vanishing points, except those of lines parallel to the ground, nor Ubaldi neither: while Taylor did use them, which is the distinctive feature of his system. Again, it is a strong presumption in favour of Taylor's originality in this point, that works published abroad shortly after his time do not contain an extension of the *Kurzgefasste Einleitung zur Perspectivon*, von J. C. Bischoff, 1741, a quarter of a century after the time of Taylor's publication, contains no use of vanishing points except at the height of the eye.

The *Methodus Incrementorum* is the first treatise in which what is at this day called the calculus of finite differences is proposed for consideration. Besides what are now the most common theorems in this subject, there are various purely formal or infinitesimal theorems, such as the change of the independent variable, integrations, J. Bernoulli's series, &c., and various applications to interpolation, the vibrating chord, the catenary, dome, &c., centre of oscillation and percussion, law of the attraction of light, &c. The last enunciation of the celebrated theorems is as follows:—

**PROP. VII. THEOR. III.**

Sint $x$ et $t$ quantitates duas variabiles, quarum $x$ uniformiter augmentat per data incrementa $x$, et sit $v=v_0+v_1t+v_2t^2$, &c. equalibus quae tempore $x$ uniformiter fluendo $x^4$+$x^3$+$x^2$+$x$+$v_0$.

*Corollary I.* expresses the corresponding theorem for decrements.

**Coroll. II.**

Si pro incrementis evanescentibus scribantur fluxiones ipsius proportionales, factae jam omnibus $v_0$, $v_1$, $v_2$, &c., equalibus quae tempore $x$ uniformiter fluendo fit $x^4$+$x^3$+$x^2$+$x$+$v_0$.

Taylor does not make much use of his own theorem in the *Methodus Incrementorum*, but he shows his command over it in the paper above cited on the roots of equations, in which he extends Newton's method to other than algebraical equations.

One would have supposed that such a theorem as that of Taylor, the instant it was proposed, would have been hailed as the best and most useful of generalizations: instead of this, it sank, or rather never rose, till Lagrange pointed out its power. This is perhaps an assertion which some may doubt: we proceed to make it good. The first criticism upon the whole work (without a word about the theorem) is that of Leibnitz, in a letter to Bernoulli (June, 1716, vol. ii., p. 380, of their correspondence), and it will show what sort of view the neglect of this theorem was the consequence. The translation is as follows: I have not found what Taylor calls his Method of Increments. It is an application of the differential and integral calculus to numbers, or rather to general magnitude. Thus the English have placed the horses, according to the proverb, behind the cart. I began the differential calculus with series of numbers, and so came naturally from the general calculus to the special geometrical or infinitesimal calculus. They proceed the other way, because they have not the true method of investigation. It is written obscurely enough.* Bernoulli an-

*[Scioraphia*, prop. III. *Si admodum breviter recte per vitruum ipsius speciem generaliter quomodo per incrementas sine termino ad incrementum consequentiam admodum pariter radii admodum recte parallelus est si admodum pervenit parvis parvis aequans, quam consequens modum aliquotem supra pervenit tamen quis conexco.]

... (August, 1716, p. 380):—* I have at length read Taylor's book. What, in the name of God, does the man mean by that, and why was it written?* No doubt to conceal his habit of thinking; as far as I can make it out, I see nothing but what he has stolen from me, through his thick cloud of obscurity. The notion of Leibnitz preserved for a long time, and is not to be found in his own demonstration. The Differential Calculus was to be used only as the means in which pure algebra was to be applied to geometry and physics, and even a generalization of existing theorems. It is well expressed in the *Lecons d'Analyse* of Cauchy, that the Calculus was a positively erroneous mode of proceeding.

In Britain, two really great disciples of Taylor soon appeared, Stirling and Maclaurin. The first (Math. J. p. 102) repeated the theorem as given by Taylor himself. Boscovich had not only given a new name to the *Phoronomia*; and as this last work was published in 1743 were Stirling's assertion true, Herman must probably be considered an independent inventor. But on examining the appendix to the *Phoronomia*, (389), to which Stirring refers, we find only the theorem in book v., lemma 4, at the Principia, and John Bernoulli's series for the constant of Taylor's theorem, expanding not $x(x+2)$, but $x(x+2)$ or expanding $4x^2$ in powers of $x$. Neither thought he was doing more than proving Taylor's theorem, and both attributed the result to Taylor. Nevertheless this particular case of the *Correction* is ascribed to Maclaurin, in page 39 of his book, and not Taylor's, it is Stirling's. Maclaurin's book was a doubt, more read than either of the other two: it was the answer to Berkeley's metaphysical objections, and contained greater power and vast stores of light, and may have been the reason why a theorem which was used, in, and best known by, Maclaurin's book, should be called after his name. It is well that it should be so; rather, it would be well if the development of $4x^4$ in powers of $x$ should be called by the name of Stirling, for the truth of the development of $a(x+b)$ in powers of $x$ one theorem or another in its uses, and in the consequence it suggests, according as $a$ or $b$ is looked at, is the primum legis.

In the interval between Taylor's death and Lagrange's paper in the Berlin Memoirs for 1772, in which he first proposed to make Taylor's theorem the foundation of the Differential Calculus, the theorem was hardly known, not even to Taylor himself. It was not found in Hodgeson's *Fluxions* (1737), in Maria Arnesi's *Institutions* (1748), in Landen's *Residuali Analisi* (1764), in Simpson's *Fluxions* (1777), in *Emmonson's *Inventions* (1803), in *Emmonson's Fluxions* (1743), in *Stone's Mathematical Dictionary* (1749), in *Montuclaud's* *Dictionary of Montuclaud's History (1758). We have examined various other places in which it should be, without finding it anywhere, except in the great French Encyclopedic article 'Series', and there we certainly did find it, mention it incidentally, and attributed by no less a person as Condorcet to D'Alembert. The Abbé Bouret, who wrote the preliminary essay, knew nothing about the theorem at that time; though afterwards, when he published his history of mathematics, he was better informed. We found afterwards that Condorcet (Lacroix, tom. iii. p. 38) was in the habit of assigning this theorem to D'Alembert not with any unfair intention, but in pure ignorance. The fact was that D'Alembert (*Recherches sur differentes questions*, &c., vol. i. p. 50), according to the account of the first time the theorem accompanied by a method of finding the remnant of Taylor's series after a certain number of terms has been taken; and Condorcet, who probably never even heard of the new, elsewhere, thought it was D'Alembert who had given this idea. In fact, D'Alembert himself gave the name of Taylor as if it were new, and without mentioning the name of any one. Lacroix says that 'assez singular,' an opinion in which we cannot agree. Unless D'Alembert read English, we cannot imagine how he should have remembered such a theorem, nor even then, unless Taylor, Stirling, Maclaurin, or any old volume of the Philosophical Transactions, should have been familiar in his hands. We have no doubt that D'Alembert was a new discoverer of the theorem, and that Condorcet, as he never saw it except in his writings. Our wonder rather is where Lagrange could have found the name of Taylor
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connection with it. For the use which Lagrange proposed to make of it, see Differential Calculus, and Functions, Theory of. From the time of the publication of the works cited in the article Taylor refers to, Taylor's theorem takes that place which, if it had always occupied, we should not have had to write any history of it. Full justice is done to the discoverer: it only remains to restore to Stirling the view of the theorem which has hitherto been given to Maclaurin.

Taylor's Theorem. We propose in this part of the article to give some account of the methods of algebraical development which are consequences of the celebrated theorem, the history of which is given in the last article. The simplest parts of the Differential and Integral Calculus will be presumed known. It is not usual in works on that subject to bring together in one place the most conspicuous theorems which have arisen out of that of Taylor; which makes the more desirable that such a thing should be done in a work of reference. It is to be particularly remembered that we do not here profess to teach the subject of development, but only to recall the steps of the several processes to those who have already learnt them, and to present the theorems in a form which can be easily referred to.

As to notation, we shall frequently signify differentiation by accent: thus $\phi'$x is the second differential coefficient of $\phi$ with respect to x; $\phi''$x is the third differential coefficient of the product of $\phi x$ and $\phi x$. And $\{x\}$ will signify the product $1 \times 2 \times 3 \times \ldots \times (x-1) x$. Moreover when a series is written, three terms will be written down, and the general term appended.

Taylor's theorem is as follows:—

$$\phi(x+a) = \phi(x) + \phi'(x)a + \frac{\phi''(x)}{2!} a^2 + \text{etc.} \quad \left\{ \phi^{(n)}(x) \right\}$$

This theorem is true whenever x has such a value that—

1. No one of the set $\phi, \phi', \phi'', \ldots$ is infinite. 2. All of them do not vanish. Thus neither of the following could be allowed to be treated by it when x = a:

$$\sqrt{(x-a)}, \log x \text{ and } e^{-x-a}.$$ 

In the first function, $\phi'x$, and all which follow, are infinite when $x = a$; in the second $\phi x$ and all its differential coefficients vanish when $x = a$. The meaning of this circumstance is as follows. In the form of Taylor's theorem essentially requires that $\phi(x+a)$ should be developed in ascending integer powers of $a$; consequently when such form of development is impossible, this theorem must show signs of being inapplicable. Now, the form of these functions (when $x = a$) can only have $\phi(x+a)$ expanded in ascending fractional powers; and the second only in descending integer powers. Those who will only allow the use of converging series may require that $a$ should be so small that the resulting series is convergent: but this objection will afterwards be inapplicable, as will be seen.

We shall state five proofs of this theorem briefly, being substantially those given by Taylor, Maclaurin, D'Alembert, Lagrange, and Ampère.

Taylor's Proof.—Let $n = h$, and form differences of $\phi x$ (from the series $\phi, \phi(x+h), \phi(x+2h), \ldots, \phi(x+nh)$). Consequently we have [DIFFERENCE]

$$\phi(x+nh) = \phi(x) + n \Delta \phi x + n \frac{(n-1)}{2} \Delta^2 \phi x + \text{etc.}$$

where $\Delta x = h$. Throw this into the form

$$\phi(x+h) = \phi(x) + h \Delta \phi x + \frac{h^2}{2!} \Delta^2 \phi x + \text{etc.}$$

Let $n$ increase without limit, $\Delta x$ at the same time diminishing, so that $\Delta x = 0$ always remains $\Delta x$. Then

$$\phi(x+h) = \phi(x) + \lim_{\Delta x \to 0} \frac{\Delta \phi x}{\Delta x} h + \lim_{\Delta x \to 0} \frac{1}{2!} \frac{\Delta^2 \phi x}{\Delta x^2} h^2 + \text{etc.}$$

So that Taylor's theorem is proved when we know that $\phi' x$ is the same as the limit of $\Delta \phi x : (\Delta x)^2$. This was an assumption of Taylor's: but in the modern differential calculus it is a better plan to prove Taylor's theorem in another way, and then from the preceding follows the simplest manner of obtaining the identity of $\phi' x$ and the limit of $\Delta \phi x : (\Delta x)^2$.

Maclaurin's Proof.—The method here given was first used by Maclaurin, and though it was only applied to develop $\phi(0+h)$, yet it will do equally well for $\phi(x+h)$; and Maclaurin himself saw no difference (as indeed there is none, $\phi$ being any function whatever) between the two cases. It turns upon $\phi(x+h)$ and the same result, whether differentiated with respect to $x$ or $h$, and assumes the form of the development, which is a radical defect. It is as follows:—Let $\phi(x+h) = A + Bx + Cx^2 + \ldots$; then $\phi(x+h) = 2C + 3x + \ldots$. Let $\phi(x+h) = 2C + 3x + \ldots$. In which, when $h = 0$, give $\phi(x) = A$, $\phi(x) = B$, $\phi(0) = 2C$, $\phi'x = 3x + \ldots$; from which the theorem readily follows. The common proof, given in most elementary works on the differential calculus, is but a less commodious form of this.

D'Alembert's Proof.—The first principles of the Integral Calculus give

$$\phi(x+a) = \phi(x) + \int_a^{x+a} \phi'x \, dx.$$ 

Let $z = x+h-z$:—

$$\int_0^z \phi'(x-h-z) \, dx = \int_0^h \phi'(x-h-z) \, dx + \int_h^z \phi'(x-h-z) \, dx;$$

the last step being made parts. Similarly

$$\int_0^z \phi''(x-h-z) \, dx = \phi'\left. x \right|_0^h + \int_0^h \phi'(x-h-z) \, dx;$$

$$\int_0^z \phi''(x-h-z) \, dx = \phi'\left. x \right|_0^h + \int_0^h \phi'(x-h-z) \, dx.$$ 

And so on: whence it appears that if we go up to $\phi$ in the series, the term involving $\phi$ may be followed by another, expressed in the form of a definite integral, and which alone represents all the remainder of the series; as follows:

$$\phi^{(n)}(x) \frac{h^n}{n!} \left. x^n \right|_0^h + \int_0^h \phi^{(n+1)}(x-h-z) \, x^n \, dz.$$ 

The conditions of integration require that neither $\phi x$, $\phi' x$, $\ldots$, $\phi^{(n)} x$ should be infinite from $x = a$ to $x = a + h$, both inclusive: this one condition being satisfied, the difficulty of divergent series disappears; for the theorem does not give an infinite series at all, but only any number we please of the terms of a series together with a concluding quantity which is finite both in form and reality. This integral might frequently be difficult to use, but limits for its value may be readily obtained. Let $P$ and $p$ be the greatest and least values of $\phi^{(n+1)} x$ from $x = a$ to $x = a + h$, both inclusive: then the concluding integral lies between

$$P \int_0^h z \, dz + p \int_0^h z \, dz = \frac{P h^{n+1}}{n+1} + \frac{p h^{n+1}}{n+1}.$$ 

Now when a continuous function does not become infinite between two values of $x$, every quantity which lies between its greatest and least value is one of its intermediate values: or anything between $P$ and $p$ is a value of $\phi^{(n+1)} x$ (for some value of $x$ which is either 0 or 1, or between them. Hence the preceding expression may be written

$$\phi^{(n)}(x) \frac{h^n}{n!} + \int_0^h \phi^{(n+1)}(x-h-z) \, z^n \, dz.$$ 

The following form has been given by M. Cauchy. Let $P$ and $p$ represent the greatest and least values of $\phi^{(n+1)} x$ (for some value of $x = 0$ to $x = 1$, both inclusive: precisely similar reasoning will give for the last term chosen of Taylor's series, and the value of the remnant,

$$\phi^{(n)}(x) \frac{h^n}{n!} + \phi^{(n+1)}(x+h- \delta h) \frac{h^{n+1}}{n+1},$$

where $\delta h$ is either 0 or 1, or between them.
We call the preceding D'Alembert's proof, but it is rather D'Alembert's result, and even that in a different form: his real process is as follows:—To take a case, integrate $\phi^iv(x+a+h)$ four times with respect to $a$, beginning at $h=0$: the results are $(x+a+h=X$ for abbreviation)

$$\phi^ivX=\phi^ivx=\int dh\cdot\phi^ivx$$

$$\phi^ivX=\phi^ivx-\phi^iv^ix.x. h=(\int dh)^{\phi^ivx}$$

$$\phi^ivx-\phi^ivx.x. h=\frac{(\int dh)^3}{2}\cdot\phi^ivx$$

$$\phi^ivx-\phi^ivx.x. A-\phi^iv^ix^A. h^2-\frac{(\int dh)^3}{2}\cdot\phi^ivx,$$

and from this sort of process the result is

$$\phi(x+h)=\phi(x)+\phi^ivx.x. h+\phi^ivx^A. h^2+\ldots$$

$$+\phi^ivx^a=\int h^3\cdot\phi^ivx(x+h),$$

the two sides presenting the most identical forms which have yet occurred. The integral may easily be reduced to the form already given (Lacroix, vol. iii., p. 397). D'Alembert finished with the preceding form: it was Lagrange who first gave the limits which we have appended above.

**Lagrange's Proof.**—By this we do not mean the fallacious proof referred to in Poccius's Theory of, but that by which Lagrange established the limits of the value of the remnant, which, on the ordinary definition of a differential coefficient, is a proof, and a very satisfactory one, of the whole theorem. It rests upon the proposition that if $a$ is a function of $x$ and always one sign from $x=a$ to $x=a+h$, the integral of that function taken between those limits will have the same sign.

If then we wish to establish Taylor's theorem as far as, say, the term involving $A^2$, and to give the limits of the remainder, let $P$ and $p$ be the greatest and least values of $\phi^{iv}(a+z)$. From $z=0$ to $z=x$.

Between those limits then $\phi^{iv}(x-a)$ is negative: integrate from $z=0$ to $z=x$ any value not greater than $A$, and, by the preliminary theorem, $\phi^{ivv}(x-a)$ is negative. Integrate successively under the same conditions, and we learn, step by step, that

$$\phi^ivv(x-a)=\phi^ivv\cdot a-\phi^ivv\cdot a^2P\cdot x^2$$

$$\phi^{ivv}(x-a)-\phi^{ivv}(a-x)\cdot x-\phi^{ivv}^a\cdot x^2-P\cdot x^3$$

are severally negative. But $\phi(x-p)$ is positive from $x=a$ to $x=a+h$; consequently, proceeding in the same manner, we find that $x$ being not greater than $h$,

$$\phi(x+a)=\phi(x-\phi^ivv(x-a))=\phi(x-\phi^ivvA+\ldots+P.2.3.4)$$

is positive. If then we make $x=A$, we find that $\phi(x+A)$ lies between

$$\phi(x+a)+\phi(x)+P.2.3.4$$

and $\phi(x+a)+\phi(x)+P.2.3.4$ and the rest is as in the last proof.

There is a proof given by M. Cauchy which resembles the preceding in its principle, though of very different details, which may be seen in the *Lib. U. K.* Differential Calculus, pp. 68, &c., 767. But this proof, though very well in a treatise on the subject, on account of the collateral uses of the preliminary theorems which it requires, is not so well suited to an isolated article on Taylor's theorem.

**Ampère's Proof.**—Let $\phi=\phi_0+a+P(x-a)$; differentiate successively with respect to $x$, and we have

$$0=\phi_0^iv+a^iv(x-a)+P^iv(x-a)=2P^iv$$

$$0=\phi^ivv+P^ivv(x-a)-3P^ivv, &c.,$$

substitute for $P^ivv$ (by $\phi_0^ivv$ &c. their values: that is substitute, from each equation to the preceding, and we have, making $x=a+h$, Taylor's theorem with the following result for the remnant following the term which has $A^v$ in it

$$\phi(x+a)+P(x+a)+\phi_0^iv(x+a)+P^iv(x+a)$$

making $x=a+h$ after differentiation.

It gives some trouble to show the limits of this expression, for which we may refer to Ampère, *Péces de Calcul Differential,* etc., Journ. Ee. Polytechn., cit. xii., p. 12h. This tract of Ampère is one of the purest deductions existent of the Differential Calculus from the theory of limits.

In looking through all the proofs which give limits to the remnant of the series, it will be seen that neither $\phi^ivv$ nor any differential coefficient employed can be allowed to become infinite between $x=a$ and $x=a+h$. When such a circumstance does occur, the theorem relative to the limits may cease to be true. For instance, let $\phi(x-a)^2$ become the series after the first term, which gives

$$\frac{1}{a+h}\frac{1}{m-1}$$

if $a=4$ and $a$ be both greater or both less than $m$, a value of $\phi$ lying between 0 and 1 will be found to satisfy the equation, as it should do from the theorem. But if $x=2$ between $x=a$ and $x=a+h$, none but an imaginary value of $\phi$ will satisfy this equation.

Stirling's theorem, as it should be called, Macaulay's as it is called, is found simply by making $a=0$ in the development of $\phi(x+a)$. It gives

$$\phi(x+a)+P(x+a)+\phi(0)\cdot x^2+\phi(0\cdot x^3$$

$$+\phi(0\cdot x^4)\cdot x^2+\ldots,$$

$\phi$ being either 0 or 1, or between them. Here $\phi(0\cdot x)$ is $\phi(x)$ differentiated $n$ times, and $x$ made negative one after another.

It gives the most useful results of Taylor's theorem, with which it may be considered identical in one point of view, and of which it is a particular case in another: for $\phi(x)$ is absolutely developed by Stirling's theorem is simply $\phi(x)$ developed for $\phi_0$ by Taylor's theorem.

*John Bernoulli's theorem,* as given in the *Leipsic Acta* for 1696, is as follows:—

$$\int_0^a \phi(x) dx = \phi(0) + \phi(0\cdot x^2 + \phi(0\cdot x^3$$

Here is an instance very much resembling the converse of the *Binomial Theorem* (p. 412) with Wallis's process of investigations. If Wallis had looked at his own result as a new point of view, he might not have left the binomial theorem for Newton: if John Bernoulli had done the same, he might have given the law of development of $\phi(x+a)$. The preceding is a case of Taylor's theorem as follows: by that theorem

$$\phi(x-a) = \phi(x-a) - \phi(x-a)$$

$$\pm \phi(0\cdot x^2 + \phi(0\cdot x^3$$

and $x-\theta x$ is the same in meaning as $\theta x$, an undetermined fractional part of $x$. Let $\phi(x) = \int_0^a \phi(x) dx$, then $\phi(x) = \alpha$ substitution and transposition give

$$\int_0^a \phi(x) dx = \phi(0) + \phi(0\cdot x^2 + \phi(0\cdot x^3$$

This theorem is not of much use as a method of development, so that we need say no more of it in the present article.

Some views of Lambert on the reduction of the roots of equations (*Acta Helvetica, 1758*) into series were generalized by Lagrange (*Mem. Acad. Sci.* 1768) in a celebrated theorem of development bearing his name, and this again was generalized in form by Laplace (*Mec. Oe.*
The problem is as follows: given

\[ y = F(x + z \phi x) \]  

required the expansion of \( y \), when possible, in powers of \( x \). Since \( \phi \) is, by the preceding equation, a function of \( x \) and \( z \), if \( z \) be constant, and we differentiate with respect to \( x \), and then make \( z = 0 \), or \( z = Fz \), we may use Stirling's theorem. But this differentiation would be laborious and indirect; it was made more direct (by Laplace) in the following manner: A constant may have any value given to it, or may be made to vanish, either before or after differentiation with respect to a variable: if then we can express differentiations with respect to \( x \) in terms of differentiations with respect to \( z \) only (in which \( z \) is constant), it will be in our power to make \( z \) vanish before the differentiations, which will reduce the indirect or implicit to direct differentiation. This substitution of \( x \)-differentiations in place of those of \( z \) is done as follows: Differentiate (both) with respect to \( x \) and \( z \) separately, and we have

\[ \frac{dy}{dx} = F'(x + z \phi x) \left( \phi x + z \phi' x \right) \frac{dy}{dx} \]  

whence

\[ \frac{dy}{dx} = F'(x + z \phi x) \left( 1 + z \phi' x \right) \frac{dy}{dx} = \phi x \frac{dy}{dx} \]

Let \( y \) be a function of \( y \) only, that is, not of \( x \) or \( z \) except as these variables are contained in \( y \); then

\[ \frac{dy}{dx} = \phi \frac{dy}{dx} \]  

From this equation only it may be shown (by Incro- 
exon) that

\[ \frac{d^m u}{dx^m} = \frac{d^{m-1}}{dx^{m-1}} \left( \phi \frac{du}{dx} \right) \]  

as follows. Assume the preceding to be true for one value of \( n \), and, since \( \left( \phi \frac{d}{dx} x \right) \) is a function of \( y \) only, let it be \( \phi \); \( v \) being another function of \( y \),

\[ \frac{d^m u}{dx^m} = \frac{d^{m-1}}{dx^{m-1}} \left( \phi \frac{du}{dx} \right) = \phi \frac{d^m u}{dx^m} \]  

whence the theorem remains true after writing \( n + 1 \) for \( n \). But it is true when \( n = 1 \), for \( n \) is true for all values of \( n \). If then we make \( x = 0 \), or \( y = Fz \), which may be done before the differentiation on the second side of the equation, we have (\( u \) being \( \phi \))

\[ \left( \frac{d^m y}{dx^m} \right)_{x=0} = \left( \frac{d^{m-1}}{dx^{m-1}} \left( \phi \frac{dFz}{dx} \right) \right)_{x=0} \]  

Apply this to Stirling's Theorem, and we have Laplace's Theorem, namely,

\[ y = F \left( x + \phi \frac{dFz}{dx} \right) \]  

This is the case in which \( F = e^x \), namely,

\[ y = e^x + \phi \frac{dFz}{dx} e^x + \frac{d^2Fz}{dx^2} e^x + \cdots + \left( \frac{d^nFz}{dx^n} \right) e^x \]  

Lagrange's theorem, from which Laplace generalized, is the case in which \( F = x \); namely, \( x = z + \phi \frac{dFz}{dx} x + \frac{d^2Fz}{dx^2} x^2 + \cdots + \left( \frac{d^nFz}{dx^n} \right) x^n \) and

\[ \frac{d^m y}{dx^m} = \frac{d^{m-1}}{dx^{m-1}} \left( \phi \frac{dFz}{dx} \right) \]  

Now the general term of this has for its co-efficient the value of

\[ \frac{d^{m-1}}{dx^{m-1}} \left( \phi \frac{dFz}{dx} \right) = \frac{d^{m-1}}{dx^{m-1}} \left( \phi \frac{dFz}{dx} \right) \]  

when \( x = a \); consequently \( \phi \) is, expanded in powers of \( x \), found by making \( x = a \) in the co-efficients of the powers of \( x \) in the following series:

\[ \phi = \phi(a) + \phi(a) \frac{dx}{a} + \left( \frac{d^2 \phi}{dx^2} \right) \frac{dx^2}{a^2} \]  

When in a function of any number of variables \( x, y, z, \ldots \), the variables are severally to receive increments \( \delta x, \delta y, \delta z, \ldots \), the law of the development is best seen by the calculus of operations. [Observation.] To change \( x \) into \( x+h \) for the operation \( D \), being the symbol of differentiation with respect to \( x \), is the condensed form of the development now before us

\[ \phi(x+h) = \phi(x) + \frac{d}{dx} \phi(x) \frac{h}{x} + \frac{d^2}{dx^2} \phi(x) \frac{h^2}{x^2} + \cdots + \left( \frac{d^n}{dx^n} \phi(x) \right) \frac{h^n}{x^n} \]  

where \( D, D_x, \ldots \) refer to \( x, x, \ldots \). The general term of the development is

\[ \left( A_{D_1} + A_{D_2} + \cdots \right) \phi(x) \]  

which must itself be developed. It is not worth while to pursue this case further; we shall only observe that when it is desired to stop, the remainder may be obtained by writing in the last term \( x + \delta x \), for \( x, x + \delta x, \ldots \), the \( \delta \) the same in all, is either 0 or 1, or between them.

The value of \( x \) which makes \( x = a \) is represented by

\[ a - \phi(a) = 2^{a^n} - 2^{a^n} \]  

\[ 2^{a^n} - 2^{a^n} \]  

\[ \left( 10^{a^n} \right) \]  

\[ - \cdots \]  

\[ \cdots \]  

All that precedes is found in elementary treatises, with the exception of a few terms of the last series: we now come to matters which has been hitherto only the property of the well-read mathematician, but which well deserves to be made as common as Taylor’s Theorem. We refer to Arbogast’s method of derivations. Few, even among mathematicians, are aware of the power of this process, which may perhaps arise from their taking Lagrange’s account of it, instead of consulting the work itself: the former has only exhibited it to show that it may be reduced to processes of the differential calculus; and even the latter has so loaded his method with heavy applications, that he has concealed much of its beauty and simplicity.

The foundation of Arbogast’s methods is a contrivance for expediting the expansion of \( \phi(a+x+\cdots) \) into a series of the form \( A + B x + C x^2 + \cdots \). The process by which \( B \) is formed from \( A, B, \ldots \), \( C, \ldots \), is uniform, and is called derivation; and \( A \) being \( \phi(a) \), \( B \) may be called \( d\phi(a) \), \( C \) may be called \( d^2\phi(a) \), and \( D \phi(a) \), and so on. Hence \( B \) ought to be called \( Da \), \( C \) ought to be \( Da^2 \), and so on. But this notation is not precisely that of Arbogast, but will do for our purpose. For more details see the Differential Calculus (Library of Useful Knowledge), pp. 328-334.

* There is a great deal on the subject in the Mathematical Treatises (posthu- mous) of the Rev. John West, published at Edinburgh in 1838. No. West Vol. XXIV.-8
If, for a moment, we write the expansion thus—
\[ \phi'(a + x, a + x^2, \ldots) = A_1 \phi + A_2 x^2 + \ldots + C_{nc} ; \]
and if we differentiate both sides with respect to \( a \) and all the other coefficients remaining constant, we have
\[ \phi'(a + x, a + x^2 + \ldots) \cdot x = \frac{dA_1}{dA} \cdot x + \frac{dA_2}{dA_1} \cdot x^2 + \ldots ; \]
which shows that \( a \) cannot enter any coefficient preceding \( A \).

The first side of this is the same series, whatever letter \( a \) was made to vary; the second side is therefore always the same series; whence we collect that \( \frac{dA}{dA} \cdot x + \ldots \) does not alter with the value of \( m \), being always the coefficient of \( x^m \) in the development of \( \phi'(a + x, a + x^2, \ldots) \). It is enough to satisfy this condition for each letter and its preceding one; that is to say, each coefficient differentiated with respect to any one letter, is to yield the same result as the directly preceding co-efficient differentiated with respect to the directly preceding letter. The following rules are found sufficient. To pass from any one derivative of the last to the next, arrange the letters \( a, b, \ldots \) or \( a_n, a_{n+1}, \ldots \) whichever may be used, in order, in every term: differentiate with respect to the last letter in each term, and multiply by the letter which comes next to it. And when the last but one immediately precedes the last in the alphabet or any other consecutive system, do the same with the last but one, and divide by the exponent of the last letter, as it becomes after the increase which it receives from the process of the preceding letter: but in no case use any letters but the last or the last but one. For instance, beginning with \( \phi\), in which is only one letter, we have \( \phi, b \), or
\[ D\phi = \phi' + \phi'' x^2. \]
In forming \( D\phi \), we use only \( c \) in \( \phi, b \), because \( a \) does not immediately precede \( c \); and we get (the succession being \( a, b, c, f, g, h, k, \ldots \))
\[ D\phi = \phi' + \phi'' x^2 + \phi''' x^3. \]
and so on. As soon however as the law is established, it is best to form a table of the successive derivatives of the powers of \( a \) by this same law: we then have
\[ D^n \phi = \phi' \phi'' \phi''' \ldots x^n \]
as far as \( \phi^n \phi^n \quad \text{at} \quad \frac{n}{2} \]
in which \( \phi', \phi'', \phi''' \), &c. are to be taken from the function by common differentiation, and the derivatives of the powers of \( a \) from the table. This being done, we have
\[ \phi(a + x, a + x^2 + \ldots) = \phi + D\phi + D^2\phi \phi \phi' + D^3\phi \phi' + \ldots, \]
and the process is shortened to its utmost extent; all that is not differentiation being merely referred to a table and writing the result.

We shall give materials for proceeding as far as the term \( D^n\phi \phi' \phi'' \phi''' \ldots \), not that so much will often be necessary, but because it is desirable to show with how little trouble questions of enormous labor in the ordinary way, such, for instance, as that solved in Reverson of Sirris, may be looked at without dismay. We have to form every derivative of every power of \( b \), \( D^n a \), in which \( m + n \) does not exceed 12.

And as it is possible for one or more letters to be introduced simultaneously, we can give at once the table without writing the process. If we are to proceed to the 13th power of \( b \), the table is as follows:

<table>
<thead>
<tr>
<th>( b )</th>
<th>( D^n b )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2b</td>
</tr>
<tr>
<td>3</td>
<td>3b^2 + 2b^3</td>
</tr>
<tr>
<td>4</td>
<td>4b^3 + 6b^4</td>
</tr>
<tr>
<td>5</td>
<td>5b^4 + 10b^5</td>
</tr>
<tr>
<td>6</td>
<td>6b^5 + 15b^6</td>
</tr>
<tr>
<td>7</td>
<td>7b^6 + 21b^7</td>
</tr>
<tr>
<td>8</td>
<td>8b^7 + 28b^8</td>
</tr>
<tr>
<td>9</td>
<td>9b^8 + 36b^9</td>
</tr>
<tr>
<td>10</td>
<td>10b^9 + 45b^10</td>
</tr>
<tr>
<td>11</td>
<td>11b^10 + 55b^11</td>
</tr>
<tr>
<td>12</td>
<td>12b^11 + 66b^12</td>
</tr>
</tbody>
</table>

The student who is not perplexed by this, and cannot procure Arbegast's work, will find West's tract abundantly in derivations.
To verify these results, observe that if we consider each letter as of the first dimension, every term of $D^b$ is of the $r$th dimension; but if we consider each letter as of the dimension following that of $D^b$, we have:

$$\begin{align*}
\frac{b c e f g h k l m n}{1 2 3 4 5 6 7 8 9 10 11 12}
\end{align*}$$

then every term of $D^b$ is of the $(n + r)$th dimension. To find out if all the proper terms be there, and with the proper exponents, write down the number of ways in which $n + r$ can be made up of $r$ numbers. Thus to verify this point for $D^b$, write down the ways in which $10$ can be made up of three numbers, namely:

$$1 + 1 + 8, 1 + 2 + 7, 1 + 3 + 6, 1 + 4 + 5, 2 + 2 + 6, 2 + 3 + 5, 2 + 4 + 4, 3 + 3 + 4$$

take the letter answering to each number, in the above list, and multiply the letters of each set together, which gives:

$$b^4, bc, bch, bfg, ceg, cf, ef,$$

which are, coefficients excepted, the terms of $D^b$ in the table. To verify the coefficients separately, observe that:

$$\frac{1.2.3. \ldots (r - 1)}{1.2.3. \ldots (s + 1) \ldots (n + 1), or 168, as is the case.}$$

But the best general mode of verification is derived from the theorem:

$$D^{b - 1} = \frac{1}{r} \frac{dD^b}{db},$$

that is, having a certain derivative of a certain power, the next higher derivative of the lower power may be found by differentiating with respect to $b$, dividing by the exponent of the original power, and then performing the derivation. Thus:

$$D^{b-1} = \frac{1}{r} \frac{dD^b}{db} + \frac{1}{r} \frac{dD^b}{db} = \frac{1}{r} \frac{dD^b}{db}$$

If we find this result, the theorem is verified, and the other terms will be found the same. We also have:

$$D^{b-1} = \frac{1}{r} \frac{dD^b}{db}$$

which gives:

$$\begin{align*}
\frac{b^2}{r^2} + \frac{b}{r} + \frac{1}{r^2}
\end{align*}$$

we thus verify the earlier result of the table from the later, to verify the farther from the earlier, use the following:

$$D^b = D^{b-1} \cdot D^b + \frac{1}{2} \frac{dD^b}{db} + \frac{1}{2} \frac{dD^b}{db} + \frac{1}{2} \frac{dD^b}{db}$$

up to $\frac{1}{r} \frac{dD^b}{db}$, which in the derivatives of powers of $c$ must be formed from the corresponding tabular ones of $b$, by changing each letter into the next following. There are thus abundant means of verification. We will mention yet one method more. Only the last letter and the last but one (and that only when the two letters are consecutive) are used in the derivations. If we use any letter, a new term is produced, but only a repetition of those other terms which give. For instance, in $D^b$, there are $600 cef$, and in passing to $D^{b+1}$ we derive from $f$ because it is the last letter; and from $e$ because, being the last but one, it immediately precedes $f$ in the series. We do not here use $b$ and $c$ at all; but if we did use them, we should only repeat terms which will come from $D^b$ from other sources. Thus:

$$600 cef,$$
be. We put down tables for the development of this function, derived from the preceding tables, as far as the tenth power of $x$ to be used as follows:

Let

$$\phi (a + bx + c \frac{x^2}{2} + e \frac{x^3}{3} + \text{&c.}) = A_x + A_xx + A_x^2 + \text{&c.}.$$ 

Then $A_x = \phi'(a), D^{-1} = \phi''(a), D^{-2} = \phi'''(a), \ldots + \phi^n(a) \cdot b^n$, where the derivatives of the powers of $b$, which do not mean the same as hitherto, are to be taken from the following table:

<table>
<thead>
<tr>
<th>$D^0x^0$</th>
<th>$D^1x^1$</th>
<th>$D^2x^2$</th>
<th>$D^3x^3$</th>
<th>$D^4x^4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$b$</td>
<td>$b^2 = 3b$</td>
<td>$b^3 = 4b + 3c$</td>
<td>$b^4 = 6b + c^2$</td>
<td>$b^5 = 15b^2 + 15b + c^3$</td>
</tr>
<tr>
<td>$D^0x^0$</td>
<td>$D^1x^1$</td>
<td>$D^2x^2$</td>
<td>$D^3x^3$</td>
<td>$D^4x^4$</td>
</tr>
<tr>
<td>$D^1x^1$</td>
<td>$D^2x^2$</td>
<td>$D^3x^3$</td>
<td>$D^4x^4$</td>
<td></td>
</tr>
</tbody>
</table>

In the next derivation $b^6$ gives only $5b^2$, for it is not immediately preceding $e$ in the series $b, c, e, \text{&c.}$ and not used. But $10b^2$ gives

$$10b^2c^3 + 3b^2c^4 + 10bc^5.$$ 

Next term ($b^6x^6/4 + b^5b^2c^3 + b^4b^2c^3/2$).

In the next derivation $b^6c^3$ must be neglected entirely, because $f$ is the last letter, and $b$ is not the one immediately preceding it. Also $30b^5c^2$ and $b^5b^2c^3$ or $10b^2c^3$; while $10b^2$ gives $30b^5c^2$ and $2b^6b^2c^3/2$ or $5b^6c^3$. The whole value of $b^6c^3 + b^5b^2c^3 + b^4b^2c^3$ is as follows, and a little practice would enable any one to write it down at once, without any intermediate operations:

$$b^6b^2c^3 + (5b^5c^2 + 10b^4b^2c^3/2) + (20b^3b^2c^3 + 30b^2b^6c^3/2 + 5b^6c^3) + (10b^5b^2c^3 + 20b^4b^2c^3/2 + 10b^3b^6c^3/2 + 30b^2b^6c^3/2) + (6b^6b^2c^3 + 20b^5b^2c^3/2 + 10b^4b^6c^3/2 + 30b^3b^6c^3/2 + 5b^7c^3).$$

This process, so simple as compared with the actual performance of the four multiplications, has hitherto had in work on the higher parts of the differential calculus: it in time it should take its place in every sphere of algebra which contains the binomial theorem, of which it is the legitimate extension.

TAYLOR, JOHN, LL.D., was born about the year 1703, at Shrewsbury, where his father, according to certain accounts, wrote a Play with a prologue in verse and a prologue to the shoemakers, and a parody on Dr. J. S. barber. He received his early education at the grammar school of his native place; and afterwards went to Cambridge, where he entered St. John's College, of which he became a fellow in 1730. The great reputation which he soon acquired as one of the best Greek scholars in the University, procured him the office of librarian of the University library, which however he afterwards exchanged for that of registrar of the University. His first work is important as a pioneer in editing his edition of the same from the use of students, with short notes and a useful index of the language. The study of the Attic orators led him
to the study of the Attic law, of which he probably possessed a better knowledge than any man of his age. He was also fond of the study of the Roman and English law, and he resolved to devote himself to the legal profession. In 1741 he was admitted an advocate in Doctors' Commons, and the year after he was called to the bar. On this occasion he published a Latin dissertation, "Commentarius ad Legem Decemviralem de Inope Debitore in partes dissecedato," which is a very unsatisfactory essay, and the notes which had been brought to light by his efforts. He published an edition of two Greek orations, "Orationes duse, una Demosthenis contra Mithridat, altera Lycurgi contra Leocratem, Graeco et Latine," with notes and emendations, Cambridge, 1743, 8vo., and in the same year he published his "History of the North Carolina." This latter work was comprehensive, and a history which he wrote of the revolution of St. Paul's. In 1755 he published at London, in 4to., his 'Elements of Civil Law,' a second edition of which appeared in 1769. Dr. Taylor undertook this work at the suggestion of Lord Carteret, who had intrusted him with it. In his profession he had been instructed to be instructed in the principles and history of the civil law. The work displays great learning and knowledge of the subject, but it is not well adapted for the use of beginners; an abridgment of it appeared in 1773, in London, and extended his knowledge, and he was brought to the last period of his life. Dr. Taylor had made extensive preparations for a new edition of the Greek orators. One volume (which is the third) appeared in 1748 at Cambridge; this was the very edition which the author himself had been the author himself from completing the work, though all the materials were ready for press. The second volume appeared after his death, in 1757. The work bears the title, 'Demosthenis, Aeschines, Dinarchi, et Demadis Orations: Graeco et Latine,' and a note ed. J. Taylor. The notes, which were published at a later time, are incorporated in Reiske's 'Apparatus Criticus' to Demosthenes. In a critical point of view the edition of Taylor is not of any great worth, and its chief value consists in its notes which are very extensive in the main term of years. Dr. Taylor said to be having a most amiable and interested man: he had considerable taste for poetry, and some specimens of his muse are printed in the 'Gentleman's Magazine,' and in Nicholls's 'Select Collection of Poems.' (Aikins and Johnston's General Biography, vol. ix., p. 337, &c.; Reiske, Praefatio ad Demosthenem, p. 42, &c.)

TAYLOR, SIR ROBERT, born in 1714, was the son of a London stone-mason, who was more prosperous than prudent, for he affected a style of living very unusual at that period among persons engaged in business: he kept his carriage, and also his country-house in Essex. Towards his son, on the contrary, he appears to have been as far from liberal, as he bestowed on him only a common school education, and then placed him under Sir Henry Cheere, a sculptor, whose chief work of note is the statue of Col. Codrington, in the library of All Souls, Oxford. On this work he was suffered by his father, they not having just sufficient money to proceed to Rome, where he was obliged to live with the utmost frugality. His studies in Italy were however of no long continuance, for he was soon summoned home by his father's greatness of his fortune, being dangerous ill, in which he hurried back to England with as much expedition as the state of the Continent would then permit, and was obliged to disguise himself as a Franciscan friar. On reaching home, he found that his father was governed by two principles, economy and lack of attachment to his country, which were difficult to reconcile. Thus this entire upon his own resources and ability, all that remained for him was to set up business as a mason, and he first brought himself into notice by Cornhill's monument. His principal other work was the capture of the Grecian monument, near the north door of Westminster Abbey, the figure of Britannia at the Bank of England, and the bas-relief in the pediment of the Mansion-house, London. After this he abandoned sculpture for architecture, and one of his earliest productions in his new profession was the mansion erected by him for Mr. Gower, near the South Sea House. In 1758-59 he was employed in the alterations of old London Bridge in conjunction with Dance, and the design of buildings both public and private; yet very few among which display such architectural taste, and less of all any of that richness in decoration and detail which might have been expected from one engaged in the study of sculpture. The wings added by him to the Bank of England (afterwards swept away by his successor Soane) were at the time termed 'magnificent;' but then it could only be by comparison with the older building by Sampson, to which they were contiguous. The M.t was designed by one of Bramante's [Bramante's], and was upon so small a scale as to look insignificant in such a situation. The 'Stone Buildings' at Lincoln's Inn are such a mere architectural blank, that the columns, instead of diminishing the poverty of its character, serve only to render it the more apparent. There is however some architectural character displayed in that which is called the 'Six Clerks' Office,' situated between the other building and Chancery Lane. As for Sir Charles Asgill at Richmond, this is at least unexceptionable in taste. Though it hardly deserves the admiration it has obtained. Among his other works, Lord Grimston's seat at Gorhambury is one of the best. If not very great, he was eminently successful, and obtained great appointments and surveys to the Admiralty, Foundling Hospital, Greenwich Hospital, and the Bank of England, for which he was well qualified, being a man of most business-like habits, and of most extraordinary diligence and industry. He died in his own house in the Spring Gardens, September 27, 1788, and was buried in St. Martin's church. He gave the whole of his property to his only son, the late Michael Angelo Taylor, M.P., with the exception of a sum to the university of Oxford, to accumulate for a similar use. His successor was the Rev. Mr. Worthington, minister of the 'Gentlemen's Magazine; Cressy's Militia; Dallaway's Arts in England; Companion to Almoner, 1842.)

TAYLOR, THOMAS, was born in London on the 15th May, 1758: his parents were respectable in their calling, but not wealthy. At a very early age he was sent to St. Paul's school, and after remaining there about three years was placed under the care of a relation who held a situation in the dockyard at Sheerness, with whom he resided several years. During this time he applied himself assiduously to the study of mathematics, and also obtained the knowledge of Latin and Greek. From this, at the age of 18, he received his education at the University of Edinburgh, and entered upon his career in the ministry. He was ordained by the Rev. Mr. Worthington, a dissenting minister who possessed considerable classical acquirements, ultimately intending to complete his studies at Aberdeen with a view to the ministry. But a premature marriage and pecuniary difficulties compelled him to relinquish this plan, and to accept a junior clerkship in Messrs. Lubbock's banking-house. While in this employment he devoted his spare hours to the study of Plato and Aristotle and their commentators. At this time, and to the end of his life, Mr. Taylor always devoted himself to the study of the English language, and was the first to draw up a plan for the improvement of it, and to promote the study of the English tongue. He was the first to call public notice by an attempt to discover the secret of the perpetual lamp, upon which he gave a lecture and exhibited his experiments at the Freemasons'
TAY

Tavern. Though it was a failure, it was marked by some ingenuity and great and curious research; it made him some valuable acquaintances, who encouraged him in another undertaking, which was to deliver a course of lectures on the Platonic philosophy by Mr. Taylor. Introducing himself by such means, he was enabled to procure pupils, to whom he taught the languages and mathematics, having also been appointed to the office of assistant-secretary to the Society for the Encouragement of Arts, Manufactures, and Commerce, which he held for several years: he of course gave up and was glad to be emancipated from the less interesting labours of the banking-house. It was in this situation that he made a more extensive acquaintance among men of various ranks who are promoters of arts and sciences, than usually falls to the lot of an obscure individual; but he made something more than mere acquaintance; he acquired many friends who were able and willing to assist him in all his undertakings, and with whose help he finally accomplished all that he had in view, which was to translate the works of all the untranslated antient Greek philosophers. It was an arduous task for one man, and an absolutely hopeless one, seeing that Sydenham, with the advantage of a more regular education, being a graduate of Oxford, and a known and acknowledged scholar, had not only failed in his desire to impart knowledge to his less learned countrymen by means of the press, but had been unable to procure him an attempt for want of patronage; to the 'sorrow and shame (as his biographer says) of every friend of literature.' Yet Sydenham was a good man, highly respected, and had many friends, or believed he had: he must have been a re- ceived gentleman, being a scholar and a gentleman. He had not read, and he could always amuse or instruct if required. 'Being gifted with a very extraordinary memory, he not only retained the immense store of knowledge he had amassed, but he could bring it all into use at his will:' he was deeply read in things that many like to hear of, though they are no longer studied, sorcery, witchcraft, alchemy, &c., and his fondness of anecdote was quite inexcusable, at all this, he seemed simple and unassuming manners, and impracticable conduct, made him not only an agreeable companion to many, but to some he became almost a necessary one. Men whose occupations had prevented their reading, though they were desirous of learning, we delighted with the company of Mr. Taylor, and such were his great supporters. It was by making friends chiefly that Mr. Taylor, who was as poor as Sydenham, contrived to print works that must have cost him 10,000/. to acquire, and, if not of the saleable description, and that upon the whole produced no pecuniary profit. The duke of Norfolk printed Plato; and some unaccountable whim locked up nearly the whole edition in his house, where it remained till long after his decease, but he was attached to Mr. Taylor, and frequently made him his companion at Arundel. Mr. Meredith, a wealthy tradesman retired from business, was a man possessed of sound mental faculties, with no aversion to exercise. Having read the works of Mr. Taylor in an English translation, and Mr. Taylor was ready to help him to it upon no other condition than his undertaking to print it, which he did; and though he made a liberal speculation of it, by printing too few copies, he was so well satisfied with Mr. Taylor's exertions, that he not only assisted him in bringing out some of his minor publications, but settled a pension of 100/. a year upon him, which he enjoyed till his death: such munificence and friendship in a man who had earned his money, and knew how to spend it, is truly extraordinary; though not versed in the ancient languages, obtained a great knowledge of antient literature; he was a man who thought for himself, and came to just conclusions upon most subjects. Among Mr. Taylor's minor works some were dedicated to persons who printed them. They bore similar terms, and in a few cases gave him the benefit of the whole edition. He never exacted payment for his labour, except in one or two cases with the book-sellers.
the true arithmetick of infinites, both of which had appeared in a separate form; 25, *The Six Books of Proclus on the Theory of Plato,* 2 vols. 4to., 1816; 26, *Theoric Arithmetick,* 4to. 1750, translated from the Latin by J. H. Mead, for the benefit of private individuals, was the subject of a learned dissertation by Mr. Whiston, in a paper read before the Royal Society.


33. *Select Works of Porphyry,* Svo., 1823; 34, *The原理 and Examinations of the Princely* and other periodicals, amongst which may be specified a complete and valuable collection of the Chaldaean oracles, renewed by Mr. Cory.

35. Theophilus, M. [Taylor, Brook.]

TAYWAN. [Tai-wan.]

THAD. LAKE. [Sodan, p. 249.]

THERNOGOV. [Uzernogov.]

TEA. [Thea.]

The Paraguay, or MATE, is the produce of a plant belonging to the family Aquifoliaceae. It was formerly supposed to be the produce of the Ilex vomitoria, which is found in North America, in the Carolinas, and Florida, but from specimens sent from Brazil to Mr. Lambert, a ±green leaves, and not the leaves of the Ilex vomitoria, and was named Ilex paraguensis. It is a shrub attaining the size of the orange-tree; it is quite smooth, with bluntish wedge-shaped remotely serrated leaves, with unbellifolous flowers issued in the axis of the leaves. It is the Ilex Mact of the Tlalante, and grows wild in Paraguay and Brazil, and is called by the Spaniards Yerba Mate. The leaves of this shrub are great among the inhabitants of both America, and are used in infusion in a similar manner to the tea, and as a stimulant in all diseases. The leaves of this tree are annually collected in Paraguay, and are sent to Chili and the viceregalty of Buenos Ayres. It is not cultivated, and planters carry various articles of use into the interior, which they give the natives for their benefit, and thereby obtain their annual supply of the leaves. After the branches are cut away, the ground is heaped by means of a fire, and the branches, being laid upon the heated ground, are dried, and afterwards they are beaten and pressed into bags, in which state it comes into the market. There are three kinds known in the market: the Ca-a-geus, which is the best of the leaf; the Caa-mini, the leaf torn from its midrib and veins without roasting; and the Gu-gwala, or Terra de Polas of the Spaniards, the whole leaf with the petioles and veins. The leaves of this tree are three lines thick, thin, and steep well, and is seldom seen. The plant when used is steeped in boiling water, to which a little sugar and sometimes lemon-juice is added. It is drunk out of a vessel called mati, which has a spout perforated with holes for the passage of the liquid, and the Preventing of cutting out the fluid. The Creoles are passionately fond of this infussion, and never partake of a meal without it. The properties of this plant are sedative and stimulant.

One species of Ilex, the *Gongora,* found in Brazil, is applicable to the same purposes as the last; and although inferior in quality, was used extensively as a substitute for the true Paraguay tea, when the export of the latter from Paraguay was forbidden by the dictator Françia. The Paraguay, or Mate, is a large mass of decayed leaves, and is commonly called by the inhabitants of Florida and the Carolinas, which is used for the purpose of correcting the flavour of water.

TEA. [Tectona.]

TEAL. [Quercus ilex crecca, Steph.; Anus crecca, Linn.]

one of the smallest of the Anatidæ, and most beautiful of the Ducks, in which article will be found Mr. Swainson's observations on the subgenus denominated Teals, together with a description of the species of the genus.

Description of the Common Teal.—Adult Male.—Top of the head, cheeks, and neck of a deep chestnut; throat black; a broad band of fine glossy green passing from the eyes to the back of the neck, bordered by a pale margin in the hind part of the neck, and of the head and cheeks a black band; the scapulars, and flanks zigzagged with irregular alternate lines of black and white; breast and under parts yellowish-white, but the breast is spotted with blackish; wings—coverts brown; beauty-spot (speculum) rich glossy green, deepened into a velvety black; quills brownish-black; underside tawny—buff, with a longitudinal black band; bill black; iris brown; legs blackish-brown.

This is the nuptial dress; but, in July and August, this brilliant livery is exchanged for the more sombre hue of the Female.—Top of the head Sienna yellow, with dashes of deep brown; throat and cheeks dusky white, sprinkled with brown spots; plumage above tarnished or dull brown, each feather with a margin of a lighter colour; under parts yellowish-white; beak—yellow spot.

This is the *Sirecille, Petit Sirecille, Cerelle, Cerereille, Alebran, Garoute, and Hulébran of the French; Cercedula, Cercevolo, Sereu, Sortella, Antirella, and Anitra of the Italians; Spiegel-Entlein and Kercelit of the Germans; Wintul of the Dutch; Arca and Kraeche of the Swedes; Kestelo-and of the Norwegians; Kirkh-and of the Danes; Cor Hoyd and Broch Hoyd of the antient British."

Habitat, Geographical Distribution, &c.—Mr. Yarrell, in his 'British Birds,' now nearly complete, and forming a most valuable addition to British ornithology, thus sums up the information extant relative to the habits and locality of this pretty species, which he notices as an early and constant winter visitor, more especially to the marshes of September, sometimes sooner than that, and remaining with us till spring has made considerable progress; their numbers are constantly recruited through the winter months by additional arrivals from the northern parts of Europe, and our markets in consequence obtain a regular supply from the various decoys and other modes of capture. Although numbers in spring return again to more northern localities to breed, many remain in this country and pass the summer near fresh-water lakes. That some of them breed here also, in suitable localities, is proved by the fact that, in the summer of 1817, Mr. Youell of Yarmouth found four young birds of the Teal brought to him, which were hatched at Reedham in Norfolk. The authors of the Catalogue of Norfolk and Suffolk birds say all their young ones have been obtained in company with their parents upon Ranworth Broad, by Mr. Kerrison of that place; and that they breed also on Sc Outon Mere. The Rev. Richard Lubbock of Norfolk, in his note on this species, says, 'the Teal must, in their breeding season, that is, after the brood. The food of the Teal consists of seeds, grasses, water-plants, and insects in their various stages. In confinement they require grain. Some Teal breed about the lakes of Wales, and a few in Romney Marsh. Mr. Selby, who has paid attention to the habits of this species in Northumberland, says, 'our indigenous broods, I am inclined to think, seldom quit the immediate neighbourhood of the place in which they were bred, as I have repeatedly observed them to have hatched upon the bank by the side of their hatchings, till they separated and paired on the approach of the following spring. The Teal breeds in the long rusty herbage about the edges of lakes, in the bogy parts of the upland moors. Its nest is a bulky, untidy structure, with a lining of dry leaves and feathers, upon which eight or ten eggs rest. Dr. Heysham, in his catalogue of Cumberland animals, says that a few Teal certainly breed in the mosses of that county every year.'
White, in a letter to the Hon. Daines Barrington, dated Selborne, July 8, 1773, says, 'Some young men went down lately to a pond on the verge of Walmer Forest to hunt flappers, or young wild ducks, many of which they caught, and, among the rest, some very minute, yet well-fledged wild fowls alive, which, upon examination, I found to be teal. I did not know till then that teals ever bred in the south of England, and was much pleased with the discovery: this I look upon as a great stroke in natural history.'

But to return to Mr. Yarrell, who thus proceeds: 'In Ireland the Teal is found in great numbers throughout the winter, and a few are resident there all the year. Sir Robert Sibbald, and other authorities since his time, notice the teal as inhabiting the edges of the Scottish lakes; Mr. Dunn however says that it is not numerous either in Orkney or Shetland, although the most so in winter; but that a few pairs occasionally remain during summer and breed. They prefer the inland lakes to the sea-shore. Richard Dunn, Esq. sent me word that this beautiful little duck is widely and numerously dispersed over the whole of Norway and Sweden, but is most plentiful in the north during the breeding season. It breeds all over Lapland, both western and eastern, and is very abundant in the Dofre Fiell, within the range of the birch-trees. The eggs vary in number from ten to fifteen. It breeds also in the cultivated districts in all the mosses and bogs. Mr. Proctor says the Teal is pretty common in Iceland. Eastward of Scandinavia it is found in Russia, and is abundant in Germany, Holland, France, Spain, and Italy; visits North Africa in winter, and has been noticed at Smyrna and Trebizond. The Teal was found in the vicinity of the Caucasian range, by Russian naturalists, and is included in catalogues of the birds of various parts of India, China, and Japan. The Teal of North America is distinct from the Teal of Europe and Asia.' (British Birds.)

Mr. Gould, in his great work, 'The Birds of Europe,' remarks that M. Temminck names Northern America as among the native localities of the Teal; but Mr. Gould says that he is inclined to dissent from this opinion, for the American examples may always be distinguished by a white crescent-shaped band on each side of the chest near the shoulders. This, together with the absence of the white tertial feather, will constitute, he thinks, fair grounds for a genuine specific distinction.

M. Temminck, in the fourth volume of his 'Manuel,' has himself corrected this error, acknowledging the difference, and referring to Dr. Richardson, 'Fauna Boreali-Americana,' vol. ii., p. 443.

The teal flies vigorously. Drayton, in the 'five and twentieth song' of his 'Polyolbion,' alludes to this power. After celebrating the Duck and Mallard, he continues:—

* * * and serve to show ye see the lesser dibbling Teale, In love with the earth that fly from mere to mere, As they above the rest were lords of earth and air.

Common Teal, Querquedula crecca.

Utility to Man.—This species is one of the most delicate of the ducks. Willoughby remarks, that for the taste of its flesh, and the wholesome nourishment it affords the

bo'y, it 'd doth deservefully challenge the first place among those of its kind.'

In the 'Portraits d'Oiseaux' (1587), the following quatrain celebrates its excellence and alludes to its habits:—

Hue pieu nourrir au plaisir la gourmet
Et puis dire aux malets, dans l'air, d'une lettre
Est délicat, arrivez belle chen
Ambass' de quelque oiseau, et de quelque olon'

Accordingly we see it holding a high place in sporty feasts. We find it among the 'goodly provisons' at the banquet given at the enthroning of George Nevell, the bishop of York, in the reign of Edward IV.; 'Malories and Teales, 4000.' The price, in the Northumberland Household Book, is 'Teyllis, and Teale 1s.'

In the provision for the marriage of Roger Rockey to Elizabeth Nevile, 14th January, 17th Henry VIII., it appears among the dishes for the first course at dinner, 'Teals, 7 of a dish;' and in the account of the expense of the week for flesh, fish for the mallards and Teals, 30 dozen, are charged '£3 11s. 6d.' As in the charge of Sir John Nevile of Chete, the father of the bride above mentioned, at Lammas assizes, in the 29th Henry VIII., he then being sheriff of Yorkshire, was 42 shillings charged for 'Mallards, Teal, and other fowl.'

TEAM. Nothing is of greater importance in the management of a farm than the cattle which perform the necessary work in ploughing and other operations on the soil, in drawing manure to the land and carrying the produce to market. It is evident that the smaller the expense of the team which does the requisite work in proper time, the less the profit of the farmer, and every year which can be saved in the expense of cultivation is a gain to the clear gain. Wherever the land is only partly cultivated, and a portion of it remains in coarse pasture, which costs little or nothing to the occupier, or where a smallish common affords cheap food for oxen, the last are nearly complete teams. A farmer who can do only the work of two horses, they are maintained at a much smaller expense, and, after working for two or three years, their value is increased for the purpose of fancy farming. The necessary gear is much less expen- sive, especially where the old yoke is still in use, while across the neck or the horns. In fact for a poor man it has only a few acres of land, and who is situated near waste or common, oxen, and even cows and heifers by far the most economical teams employed on the farm culture, who in general have more theoretical than practical knowledge of husbandry, have maintained the real superiority of an ox team over that composed of horses, and have given calculations which appear clearly to bring their point. But, on the other side, it may be observed, that wherever arable land is the chief object of the farmer's attention, and the tillage of the soil is brought to any degree of perfection, there oxen are everywhere used, but have been invariably superseded by horses.

It has been urged that at Windsor Park, where it is supposed that the farms in which George III. took much interest were conducted by the most experienced agriculturists, a considerable team of oxen was kept for the most part of the work, even the carrying on the road. This is a confirmation of what we have observed before. The oxen feed on the grass of an extensive park, the use of which is not brought to account. They are very well worked, and fatten well after two or three years, but if a rent had to be paid for their pasture, or if it were calculated how many young oxen and heifers or steers could have been kept on the pasture consumed by oxen, and the profit of those were set against the work done, it would probably appear that there was a great economy in the ox-team compared with the horses. In Switzerland, which is tolerably advanced in its agriculture, oxen are very generally used for the work of the farm, but there the system of stall-feeding is universal, and having a considerable portion of grass-land, which can be irrigated by the streams from the mountains, is cut the coarse grass produced there for their food, and oxen; and this food is more congenial to these horses, which do not thrive on coarse grass, and require hay and corn nearly all the year round. Where there is less grass-land and more artificial grass as lucerne, maize, and clover, which is the case in all

* The word in Falconry for a company of Teals.
Tea

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The choice of the horses for a farm is of great importance; it may be very satisfactory to a rich farmer to see fine large well-fed horses driven and mixed with cut chalk; but with the exception of a moderate grade of eye, barley, and oats, and slightly leavened, which is perhaps the best food which can be given to slow-working horses, there is nothing so congenial to the healthy stomach of a horse as good hay and dry oats, or beans bruised in a mill and mixed with cut chalk. They require no looking to be fully digested, and the digestive power of the horse will extract all the nourishment which they contain. But there are cheaper fodders than hay and corn, especially in winter, when they can be given fresh and green. Tares, clover, lucern, and sainfoin, cut as they are wanted, will keep a horse in health and working condition with little or no corn, and at a comparatively trifling expense; carrots are peculiarly relished by horses, and are very wholesome; and Swedish turnips, or ruta baga, given in moderate quantities make their skins shine, and thus prove that they tend to keep them in condition. Every prudent farmer takes care to have a sufficient supply of these cheaper substitutes for hay and corn, keeping these last as a reserve and auxiliary to the former. In a prize essay of the Highland and Agricultural Society on the comparative advantages of raw and boiled grain as food for farm-horses, the author adds some experiments, from which it appears that there is no advantage in boiling grain, but rather the contrary. The cost of keep of a horse per day on different food has been given as follows:

- 10 lbs. of straw cut into chaff
- 10 lbs. of oats, at 3s. per bushel
- 10 lbs. of turnips, at 10s. per ton
- Expense of cutting

or—16 lbs. of hay, at 3s. 6d. per cwt.
- 5 lbs. of oats, at 3s. per bushel
- 16 lbs. of turnips, at 10s. per ton
- Expense of steaming

or—26 lbs. of steamed turnips
- 7 lbs. of coals, at 1s. per bushel
- 16 lbs. of straw, at 1½ per ton

This last appears the most economical food, but steamed turnips and straw only would probably not keep a horse in good working condition, and it is not said how long the experiment was continued, nor whether the horses thus fed lost weight. The food is also valued at a low rate.

It is evident that, if horses are kept in condition for 6d. a day, which is not 4s., a week, while on hay and oats, in the common mode of feeding, they will cost more than double that sum, the saving in a year would amount to nearly 10l. on each horse; and as every twenty-five acres of a farm of moderately light land will require one horse for its cultivation, there will be a saving of 8s. per acre, probably half the rent, and more than half the profit. However this may be, there is no doubt that it is of great importance to ascertain what is, on the whole, the best and cheapest mode of feeding farm-horses; and when entering into minute calculations, it will be found that various artificial grasses may be made to succeed each other, by successive sowings, so regularly, that the horses shall be kept for six months of the year entirely on succulent green food, which will enable them to do all the necessary work, and keep them in good health and condition. Thus with the help of carrots, potatoes, and ruta baga, a great saving of hay and oats may be effected in winter, these will take the place of hay for their production than hay and oats, and exhaust the soil less; if we except potatoes, which are more profitably used as human food or to fattening pigs.

The example of tradesmen and manufacturers who keep horses, and cut all the hay which they use into chaff, mixing it with oats, may be good for a farmer to follow, where hay is scarce and beans a good price: but otherwise it is fully as economical to give the hay in racks, provided no more be given at once than a horse will eat up entirely.

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and a certain ration be allowed for each horse, which experience has shown to be sufficient. In the cavalry, where great attention is paid to economy, the horses have their rations weighed and shaved according to the exercise they take, or the fatigue they are exposed to: so likewise it should be with a farmer's team. In the old mode of feeding horses with as much hay as they would eat, and two bushels of oats or two of the same per week, too long in many cases, for nine months in the year, and giving them tares or artificial grasses between spring sowing and harvest, when there was less to be done, the expense of a horse was much greater than most farmers could now afford; and many would have obliged the work of the team than was necessary. The following is the calculation of the cost of the keep of a horse in this way:

<table>
<thead>
<tr>
<th>Duration</th>
<th>bushels of oats per week</th>
<th>bushels of hay per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 weeks</td>
<td>20</td>
<td>32</td>
</tr>
<tr>
<td>6 weeks</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>20 weeks</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>3 weeks</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

Total £29 6

The hay and oats are at high prices, but at all events a horse cannot be kept in this way under 10s. per week. They are worked in an excellent condition, and should work ten hours per day in summer and eight in winter.

On poor land, where gorse or furze grow readily, a very cheap food is obtained by bruising or crushing the young shoots of the gorse to destroy the sharp spines which injure the cattle. Horses reared in large commons are often seen beating the gorse with their feet, and then eating it greedily: instinct here teaches them to prepare their own food; and, if they have a sufficient quantity of it, they get fat and in good condition.

It is a question if it is worth the expense to hire a farm to know exactly what number of horses will be required for its proper cultivation, and this depends upon many circumstances which must all be taken into consideration, and which will make a very material difference, often as much as half the rest of the land. He is to consider the situation of the farm-buildings, especially the stables and cattle-yards, where the manure is to be made, with respect to their distance from the fields; the state of the roads and the access to the fields; the distance of a good market-town, and whether the fields lie in a ring-fence or are scattered. A farm of good light loam will require one horse for every twenty-five acres for its cultivation, with an additional one for every 200 acres; that is, from one to two. Manure. The additional horse should be lighter and more active than the rest, for the farmer to ride on and to drive in a light cart; yet it should be capable of supplying the place of any of the others in case of illness or accident, or when extra work is required, as in harvest or seed-time. The larger the farm, or rather the fields, the fewer horses are required in proportion to its size, because much time is lost in turning the plough where the furrow is short; and ploughing is always the principal work of the team. If more than two horses are required to plough the ground, the soil must be very compact and heavy, and if this is not compensated by greater fertility, the expense of the horses will much reduce the profit of the farmer. It is the custom in some farms for each ploughman to have the charge of his own oxen; but it far better to make the feeding and cleaning of horses the business of regular servants, who should sleep in or near the stables, and rise very early, so that the horses may be fed and ready to go to work at the same hour the ploughman comes. When a man has been eight or ten hours holding a plough, he is not so capable of cleaning and rubbing the horses as one who has only had light work in the day. The horse-keepers can prepare manure, make composts, cut hay and straw into the right form, to suit the horses, and water other green food or hoe the crops in the season while the horses are at work, and the last thing before they lie down at night should be to give the horses their proper ration of hay and see that their beds are comfortable and everything in proper order in the stables: good grooming is of as great use to a horse as good feeding, and without it they will not be in perfect working condition. The harness should always be kept clean, and when they have no work to do, a place, not as is too commonly done, hung up behind the horses in the stables. There should be no unnecessary ornaments, but strength and simplicity should be studied. The weight and size of the colts is in many places about the same: the time in summer should be eight hours; but in winter may be reduced to seven. In a well-grown horse, 18 h.e. may be required, but in a small horse, 12 h.e. is as much as it can do, for it is seldom necessary to keep a man with a plough in the field when the day's work is done.

The heavier and lighter kind of work should be so managed that when horses have worked hard for a day or two, they may have one or two days of lighter work, which makes the pasture of the horses, and their daily work so much less than in Scotland: two horses should plough an acre a day or more, on an average, but few farms can get much more accomplished than three-quarter of an acre. To lay the land of Flanders, Hertfordshire, or Essex, it is necessary that the ploughman should bring two horses only; and the work is well done. There is yet more room for improvement in the use and management of the team on most farms in England.

TEANO. [Lat., Terra del]

TENELLA. [Vindobonae, p. 142.]

TEAZLE (Dipsacus Fullonum) is a plant which grows wild in the hedges, but an improved variety is cultivated in those districts of England where cloth is manufactured. It is used for the purpose of forming a species of brush with which the finer hairs of the woollen fabric are drawn to the surface, where they produce a napping effect. It is usually called the nap of the cloth. The textile worker's hand is lined with a fine, soft, smooth skin, which readily insinuates itself among the thin hairs of the cloth, and makes them stand out, the fibres of the wool; these are afterwards shrunk smooth, and leave the cloth with the fine, velvet-like nap which is peculiar appearance. A further account of the processes of the napping, in the woollen manufacture, is given in 

The growing of teazle in any soil; but they grow stronger and best in a stiff loam. They require the soil to be good, and are supposed to exhaust it much; but a great portion of manure is required to produce a good crop. Like all the tribe of thistles, they grow best on ground newly turned up from grass which has lain some time, and the same ground will not again produce them of so good a quality till after a considerable interval. The whole teazle which grows in hedges appears at first sight to be the same as the cultivated variety; but it is of no use: the cloth-worker from the weakness of the awn, which breaks off, instead of drawing the wool out of the surface of the web.

The growing of teazle is a peculiar trade, and a kind of speculation. The teazle-grower hires a piece of ground suited to his purpose from the farmer for two years, and pays a considerable rent. If the ground is broken by tilling it, as the ploughmen do, the permit is valid for two years only, and he has to pay his rent for the whole time. The ground then becomes the property of the farmer, and the grower has to take it up at his own expense, and to pay his rent for the two years. When the ground is broken by tilling, the ploughman is paid a certain sum, and the land is thus treated, and the intervals carefully hoed and weeded. During the summer, the ground is several times dug or sowed, as it is called, to a considerable depth, with very small and long spades; this greatly invigorates the plants. In November, some plants may be transplanted from these
they stand too thick, to the places where they have failed. They should stand about a foot apart in the rows. During the ensuing spring, the cultivation is repeated, and earth is drawn up to the plants, but without burying the heart. The shoots begin to push up their stems, and are let to be cut in July, just when the blackens so be to. As they do not come to proper maturity at the same time, several successive gatherings are made. They are cut with a sharp knife about nine inches below the head, and tied in small bundles or handfuls: thick gloves are very necessary for the hands of Telbadeo, which sometimes over before night, as the rains or heavy dew would injure them. When the sun shines, they are exposed to dry in the same manner as is done with onion seed, and they are never packed close until they are perfectly dry. When drying, they become somewhat concave, and it is necessary to revolve them to keep them from sticking to one another and to break the bundles. The bundles are afterwards opened, and the teazles sorted into kings, middlings and scrubs, according to their size; 5000 kings or 300 middles make a pack. The scrubs or refuse are of little value: sometimes the grower places a certain number in a flat bundle by means of a cleff stick, in which the stems are held and the heads spread out like a fan. In this state they are not only more easily packed, but more readily fixed to the handle, on which they form a continuous card, which brushes the cloth as it is drawn along while the drum revolves.

Teazles are a very precarious crop; sometimes they produce a very great profit, and at other times a serious loss. They are not particularly suitable to an arable soil. The cultivation of teazles is carried on in the plains and under the mountains, and in the district of Modena, where the marked fields are greatest. It was soon found that the wire tore the fine fibres of the wool, especially where there were knots in the thread, whereas the hooks of the teazles gave way, and either bent or broke off before the fibre of the wool was injured. The wool in the teasles was found to revolve to the artificial substitutes, and for a time the price of teasles rose to an extravagant height from their scarcity, while some time before they were quite unassailable. A quantity of teasles which was sold at one time in Berghof for 5s., being thought to be imperfect, was taken to Gloucester, where there sold by the several buyers for what they would fetch. This was exactly at a time when the price of teasles was high, and the crop was large. A good crop of teasles is about 10 or 12 packs on an acre: this is sometimes exceeded, but more often it fails by one-half, and a total failure is not uncommon. The price, however, are great, and taking all the chances, it is a crop which, except in very particular situations and circumstances, is not suited to the regular farmer, who should never speculate to any extent.

Although teazles are not to exhaust the ground much, yet from the continual stirring of the soil they render it very fit to grow other crops, provided a proper quantity of manure is used: thus very good crops of wheat have been grown on the teasles.

Every piece of fine broad-cloth requires from 1500 to 2000 teazles to bring out the proper nap, after which they are useless, the hooks being mostly broken off or decayed. This causes a considerable demand for them in the neighborhood of cloth manufactories, as in Wiltshire, Gloucestershire, and Somersetshire. In the new tariff the duty is 3s. per thousand, whether from foreign countries or British possessions.

**Baleoco or Telbadeo, Antonio**, born at Ferrara in 1430, studied medicine, and afterwards devoted himself chiefly to literature and poetical composition, both Italian and Latin. The first edition of his Italian poems appeared at Modena in 1498, by his cousin Jacopo Baleoco, apparently unknown to the author, who was named at it as having written the poem. It required some final touch: "Sonetti, Capitoli, e Rime, chiamate Opera d’Amore," 4to, Modena, 1498, afterwards reprinted several times at Milan, Venice, and other places. In 1519 appeared at Milan another small poem of Telbadeo, with the title, "Stanzne nuove ad un Vecchio che non amando in gioventa fu costretto ad amore in vecchiezza." A correct edition of Telbadeo's works is however still wanted. A selection from his pastoral poems has been inserted in the collection entitled "Poesie Pastorali e Rustiche, raccolte ed illustrate con note dal Dottore Giulio Ferrario," Milan, 1808. Bembo and Giraldo, contemporaries of Telbadeo, were of Italian poems with praise, but they regret that they were too hastily published. Telbadeo afterwards applied himself to Latin poetry, in which he acquired great reputation. He was for a time at the court of Mantua, and afterwards settled at Rome, where he became acquainted with Papal Court. He was highly of him in some of his epistles, and is said to have made him very liberal presents. After Leo's death Telbadeo fell into distress, and was obliged to borrow money of Bembo and others. He died at Rome in 1537. A few of his Latin epigrams and other small poems are in several collections.

(Tiraboschi, Storia della Letteratura Italiana; Zeno, Nota alla Biblioteca dell' Eloquenza Italiana del Fontana.)

**Tectibranchna**, Cuvier's name for his fourth order of Gastropods, described by him having the branchia attached along the right side, or on the back, in form of leaves (foliules) more or less divided, but non-branched and symmetrical. The price of the cultivation of teasles fluctuated so much that it is an uncertain speculation, resembling in this respect the cultivation of hops. Hence it is undertaken by men who are prepared to make the profits of one year pay the loss of the other.

Several attempts have been made to substitute artificial teazles, formed of hooks of very fine and elastic steel wire; and at one time there was so much appearance of success, that the branchia of cloth manufactures were to be neglected; but it was soon found that the wire tore the fine fibres of the wool, especially where there were knots in the thread, whereas the hooks of the teazles gave way, and either bent or broke off before the fibre of the wool was injured. The results were found to revolve to the artificial substitutes, and for a time the price of teazles rose to an extravagant height from their scarcity, while some time before they were quite unassailable. A quantity of teasles which was sold at one time in Berghof for 5s., being thought to be imperfect, was taken to Gloucester, where there sold by the several buyers for what they would fetch. This was exactly at a time when the price of teasles was high, and the crop was large. A good crop of teasles is about 10 or 12 packs on an acre: this is sometimes exceeded, but more often it fails by one-half, and a total failure is not uncommon. The price, however, are great, and taking all the chances, it is a crop which, except in very particular situations and circumstances, is not suited to the regular farmer, who should never speculate to any extent.

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from the vulva to the extremity of the penis, conducts the semen at the time of coition. An enormous membranous crop leads to a muscular gizzard, armed within with cartilaginous and pyramidal corpuscles, which accompany a third stomach beset with pointed hooks, and a fourth in form of a cæcum. The intestine is voluminous. These animals feed on sea-weed (fucus). A particular gland, pour by an orifice situated near to the vulva a limpid humour, which is said to be very acrid in certain species; and from the borders of the mantle there oozes abundantly a deep purple liquor, with which the animal colours the sea for a considerable distance around when it perceives any danger. The eggs are disposed in long interlaced glossy filaments, delicate as packthread.

Cuvier instances as examples from the European seas, *Aplysia fasciata, punctata,* and *deplana.* The organs cited above probably gave rise to the accounts of the poison of the Lepus marinus (an *Aplysia, and most probably* Aplysia *deplana*) among the antients. See, for example, Pliny, Nat. Hist., lib. xx., c. xxi.; lib. xxiii. c. vi., &c.

In the museum of the Royal College of Surgeons in London, No. 625 of the *Physiological Series,* is an *Aplysia alba,* in which the mantle has been laid open on the left side, and the peritoneal membrane dissected away, to show the intestinal canal winding among the lobes of the liver: the tunica serosa being transparent, the peritoneum being placed upon and transparent; permit the contents of the canal to be distinctly seen; these consist of particles of sand with comminuted fragments of zoophytes and shells: so that it appears that their diet is not at all marvellous, as Cuvier seems to have thought. Bristles are inserted at the mouth and anus; the latter orifice is situated in the branchial cavity, below the gills. No. 628 is the intestinal canal of a larger species of *Aplysia,* distended with similar particles of earthy matter; and the author of the Catalogue remarks that this preparation affords a striking example of the powers of living organized matter, and cannot be contemplated without surprise, when we consider the force that must be exerted to propel a column of such heavy and rude materials along a tortuous canal provided with particles apparently so inadequate to sustain the necessary pressure. No. 1011 is a small *Aplysia alba,* Cuv., with a portion of the mantle dissected away to expose the branchiae of an arborecent structure, but more complex and better defended than in the latter, viz., the branchial cavity being shielded by a thin horny plate or rudimentary shell. No. 1012 is a larger specimen of the same species of *Aplysia,* further dissected, so as to show, in addition to the branchiae, the heart and pericardial shell; and it is ascertained that the stomach, nervous ganglia, and the penis on the right side of the neck. A portion of the shell is left to show how loosely it is lodged between the layers of membrane forming the roof of the branchial chamber; and No. 1013 exhibits another species (*Apllyise, Plectbranchia,* Cuv.), showing the branchiae in their natural position, without dissection, by merely separating the dorsal lobes of the mantle and elevating the roof of the branchial chamber. (Cat., vols. i. ii.)

M. de Blainville divides the genus *Aplysia* into the following sections:

A. Species whose lateral appendages are very wide, divided behind, and depressed.

Example. *Aplysia depiana.*

B. Species whose narrower appendages are united and elevated behind.

Example. *Aplysia vulgaris.*

C. Species whose appendages are very wide, and which have only two tentacles, behind which are the eyes. (Genus *Aequor, Oken."

Example. *Aplysia viridis.*

D. Elongated species with a subulate tail; the four tentacles long and slender; the branchial cavity subdorsal, without operculum or shell.

Example. *Aplysia Bronnierti.*

The other genera arranged by De Blainville under the *Aplysias* are *Dolabella, Burstulesa, Notarachus,* and *East.*

M. Rang divides *Aplysia* into two subgenera:

I. The *Aplysia,* properly so called (*Lepysia, Linn.; Dolabella, Lam.; and Aequor, Oken."

This subgenus is thus characterized by M. Rang:

Animal furnished with a dorsal slit, always median and longitudinal; foot large, branchiae enclosed in the border of a cavity, whence their length does not permit them to be protruded, and gill close above by an operculum. *Shell rudimentary, calcareous, membranous, hidden in the thickness of the operculum.*

1st Group.

Body convex behind, an oblique posterior disk, borders of the mantle closed on the back, and improper for swimming. *Shell triangular and very calcareous.* This group comprises the genus *Dolabella* of Lamarck.

Example. *Aplysia Rumphii,* &c.

2nd Group.

Body narrowed at the two extremities, no disk, borders of the mantle very small and improper for swimming. *Shell subquadrandral and calcareous.* This group, M. Rang observes, is composed of new species, with the exception of one, which was erroneously arranged among the *Dolabellae.*

Example. *Aplysia doholiefera.*

3rd Group.

Body narrowed at the two extremities; borders of the mantle dilated and proper for swimming. *Shell subrounded, membranous, and solidified by a calcareous reticule.*

M. Rang remarks that this group has for its type the genus *Lepysia* of Linnaeus, and he divides it into two sections:

A. A tube at the membrane of the operculum.

Example, *Aplysia fasciata.*

B. An aperture at the membrane of the operculum.

II. Subgenus: *Notarachus,* Cuv.

The other genera arranged by M. Rang under the *Aplysias* are *Burstulesa* and *Actaeon.* (Manuel.)

Mr. J. E. Gray makes the *Aplysiade,* the 2nd family of his 3rd order (*Pleurobranchiata*), consist of the genera *Aplysia, Dolabella,* and *Notarachus.* The family is placed between the *Bulidæ* and the *Umbrellidæ.*

As an illustration of the genus *Aplysia,* we take *Aplysia depiana.*

*Aplysia depiana.*

Dolabella.

Cuvier observes that this form only differs from the *Aplysia* in having the branchiae and that which surrounds them at the posterior extremity of the body, which resembles a truncated cone. Their lateral crest, he says, does not close on the branchial apparatus, leaving a narrow furrow, and their shell is calcareous.

Locality and Habits.—European seas, where it adheres to rocks.
Natural History of the Aplysians, have, he remarks, added many important observations on the animals of this group. M. Rang, in his work, having especially studied the Aplysians, has, as we have above seen, proposed to admit into this family three genera only, Aplysia, Buratella, and Acteon, and he divides the great genus Aplysia into subgenera, among which is found the genus Dolabella, Lam. There too is to be found the genus Notarchus, Cuv. This last, observes M. Deshayes, has in fact much analogy with the Aplysians, but it preserves some peculiar characters capable of easy distinction; and he thinks that the great genus Aplysia, as considered by M. Rang, ought to be adopted. Lamarck established his genus Dolabella, and separated it from Aplysia because the shell is calcareous and not entirely conchoid, as in that genus. Lamarck, without doubt, continues M. Deshayes, would have received the little value of this character if he had been able to examine as many species as did M. Rang: he then would have seen the establishment by insensible gradations of a passage between Dolabella and Aplysia, not only with reference to the form of their shells, but with regard to their consistence also. With regard to the posterior transeunt of the animal of Dolabella, that is may be seen to disappear insensibly, so that there exist Dolabelle with a calcaceous shell, having entirely the external form of Aplysia. If, on the one hand, we see the Aplysia with calcaceous shells (Dolabelle) pass into those with conchoidal shells, we perceive on the other hand Aplysia pass to shells which have no trace of such protecting body. These remarkable species have the lobes of the mantle less slit, more closed upon the back, and nevertheless preserving the principal characters of the true Aplysia. M. Rang has established on these species his subgenus Aplysia for the singular tentacular appendages on the bodies of the species which form it. Next to Aplysia M. Rang places Notarchus, and the Notarchi are Aplysia which have only two tentacles, and whose mantle is more closed on the back than it is in the preceding genus; the foot is extremely narrow, it is terminated anteriorly by a double lip, and resembles rather the foot of the Scyllaena and other mollusks which creep on the stems of sea-weeds, than that of the Aplysia. It is to be wished, adds M. Deshayes, that the Notarchi be found in sufficient numbers for dissection, by which means all doubt with regard to them would vanish. After the genus Aplysia, M. Rang places Buratella; and M. Deshayes remarks that this genus has so great an analogy with Notarchus, that a new anatomy of the former is much to be desired. The animal seen by M. de Blainville was much contracted in the spirit, and its body was beset with a small number of tentacular appendages, which approximate it to the subgenus Acteon, whilst in form it approaches to come nearer to Notarchus. The last genus, says M. Deshayes in conclusion, placed in the family of Aplysians by M. Rang, is the Acteon of Oken, which is not sufficiently known to be definitively admitted into the system; so that the family of Aplysians may be rigorously reduced to the genus Aplysia, as considered by M. Rang.

Notarchus.

Animal furnished with a very small dorso-lateral slit, which is sometimes oblique; foot elongated, and rather narrow; branchial often very long, and capable of being protruded out of the cavity; operculum rudimentary or null. Shell null.

TECUT. (Conchology.) [Trochide.]

TECUTONIA, a genus of the natural family of Verbenaceae, so named by Linnaeus from the Indian name (Trekha) of the famous Teak-tree (called also Sugoon), which is a native of different parts of India, as well as of Burma, chiefly along the banks of the Irrawady, and of the islands from Ceylon to the Moluccas. The genus is characterised by having a 5-grooved calyx, which becomes inflated over the growing pericarp. Corol 1-petalled, 5-6-cleft. Stamens 5, but often 6. Germ superior, 4-celled, cells 1-seeded, attachment central. Drupe oblong 4-sided, woolly, apony, dry, hid in the calyx. Nut hard, 4-celled. Seed solitary. Embryo erect, without perisperm.

The tear-tree grows to an immense size, and is remarkable for its very large leaves, which are from 12 to 34 inches long and from 8 to 16 broad, and are compared by Oriental writers to the ears of the elephant. The petals, as well as the young branches and flower-stalks, are all 4-sided and the sides channelled. The inflorescence is in very large terminal panicles, of which the divisions are first cross-armed and finally dichotomous, with a sessile fertile flower in each cleft, the whole covered with a hairy farinaceous substance. The flowers are small, white, and very numerous. As tear timber is so highly valued both for domestic purposes and for ship-building, it is desirable to notice its distribution. A little more to be in detail. The best timber for ship-building was supplied to Bombay from the mountains of the Malabar Ghauts, where the tree is found rather in detached clumps, of some extent however, than in extended forests. It is also found on the mountainous parts of the Coromandel Coast, along the banks of the Godavery up to Poloonas. It proceeds far into the interior of India, and may be seen in the mountains of Bundelcund, in the form however of only a moderate-sized shrub. Dr. Roxburgh introduced the tree into the low grounds of the Cuttack Presidency, and Lord Cornwallis and Colonel Kyd planted it in Bengal about the same time. The Calcutta Botanic Garden contains a number of these trees. From the Saharanpore Botanic Garden, in 30° 9' N. Lat. (where, its buds being covered with scales, it is enabled to remain green in the winter), Dr. A. Benth., has sent to the gardens of the Calcutta Botanic Garden, a few pieces of the tree. It has been spread along the Doab Canal; the whole of the intermediate country is suited to its cultivation, and the East India Company have recently ordered the Malabar forests to be preserved. The most extensive forests are however those extending along the banks of the Irrawady, especially in Pegu. A considerable timber-trade has been established at Moulmein, whence Calcutta is supplied with some of the finest tear timber. So much straight timber is taken and the crooked left, that thousand of pieces called 'shin-logs,' and admirably adapted for ship-timbers, are left. The tree grows quickly, straight, and lofty, but requires from 60 to 80 years to attain the proper size and maturity for ship-building.

From extensive experience tear timber has been found the most valuable timber for ship-building, and has been called the oak of the East. The wood is light, brownish-coloured, easily worked, but at the same time strong and durable. It is soon seasoned, and, from containing a resinous oil, resists the action of water, as well as insects of all kinds. It does not injure iron, and shrinks but little in width. Some of the old trees have been found by Dr. Horvitz to have large and beautiful burrs like the Kias- bouca wood of commerce. No other part of the tree is known to be converted to much use; but the leaves are said to dye cotton and silk of a purplish colour. They have lately been imported into the London docks carefully rolled up, but for what purpose is not known.

TEES. [DURHAM.]
TEETH. Since the article Dentition was written, the teeth have been subjected to the most careful microscopic examination, and the result has been the acquisition of a great amount of knowledge in regard to both their structure and their mode of growth. Indeed there is no part of physiology in which more remarkable and important progress has been made during the last ten years than in this, to which the name of Odontology has been given. The chief discoveries were made coincidentally by Professor Parkin of Breslaw and Professor Reitz of Stockholm. The former published his observations in 1835, in the inaugural dissertation of Dr. Fraenkel (De dentitioni Dentium Structure), and in that of Dr. Raschow (Messentmata circa Dentium Evolutionem); and the latter communicated his descriptions to the Royal Academy of Sciences at Stockholm, in whose Transactions they were published in 1836. In 1839 Dr. Schwann published, in his "Mikroskopische Untersuchungen," an account of the modes in which the several constituent tissues of the teeth are developed; and in the same year Mr. Goodair (Edinburgh Medical and Surgical Journal, vol. ii.), carrying out the view before suggested by Professor Arnold, described that method of their early growth which is now generally received as the truth. Mr. Owen also, in his "Odontology," and in various papers, at the same time that he has confirmed and greatly added to the facts described by those already mentioned, has proved, by his investigations into their comparative anatomy, that the minute structure of the teeth may be taken as one of the most certain characters for the discrimination of the genera, and even of the species, of both existing and extinct animals; and he has already applied his knowledge of them to the determination of some of the most difficult questions of palaeontology.

In the following account scarcely any of the discoveries will be detailed except such as relate to the structure and physiology of the human teeth; for, various as the structures are in the different classes of animals, yet there is so much analogy among them, that the description of the tooth of one will, in great measure, explain the general plan of structure in the rest. Besides, the lately published articles on comparative anatomy contain nearly all the important facts regarding the structure of the teeth in the animals of which they treat.

The best method of preparing teeth for microscopic examination is to immerse them in dilute hydrochloric acid, till their earthy matter is so far dissolved that thin transparent slices may be cut from them with a knife; or, without softening them in acid, to make thin sections, in the vertical and other directions, with a fine saw, and to reduce these to the necessary thinness and transparency by filing them, and polishing them on a hard and smooth wheeestone. For general examination, lenses magnifying about 50 diameters are sufficient.

In such a vertical section of a tooth three distinct substances are seen; namely, the dentine or ivory (Fig. 1. a.), which forms the greater mass, and, as it were, the core of the tooth, and which contains the pulp cavity (b.); the enamel (c.), by which the crown or exposed part of the tooth is covered; and the bone, cement, or crista penna (d.), which forms a thin layer over the former. These layers of the tooth consist of more thickly than in the intermediate spaces, and when examined by transmitted light they appear black and dark grey. The cavities, or bone-corporcles, in man are rect. or oval, and flattened; most of them are between 60 and 70 μ in length, about one-third as much in breadth, and one-sixth as much in thickness. They have some jagged edges, from all parts of which there proceed the fine branching canals, to which the name of tubercle has been given, and which traverse the homogeneous basis of the bone, and communicate irregularly with another. The diameter of these canals, at their large parts, is not more than 10 μ of an inch; that of the smaller branches is between 5 and 8 μ. Their principal direction is towards the axis of the tooth, around which the corporcles are arranged in concentric circles.

**Fig. 2.**

Microscopic view of bone-corporcles and cancellous canals. The enamel is composed of solid prisms, or fibres (Fig. 1. a.), about 50 μ thick, set side by side and upright upon the ivory of the crown of the tooth (b.). The end of each prism is fixed in a little depression, through the outer surface of the ivory; the other, which is somewhat larger, is turned towards the masticating surface of the tooth in the direction in which the external pressure is to be resisted. The course of the prism is more or less wavy, their curves being, for the most part, parallel (Fig. 4.), but sometimes opposed. Most of them extend from the ivory to the surface of the tooth; where they do not, small complemental prisms fill the vacant spaces.

**Fig. 3.**

View of the arrangement of the enamel-fibres on the crown of an incisor tooth.

In the perfect state the enamel contains such a quantity of animal matter, that it cannot be distinguished to the sight, and the prisms are inseparably consolidated; but in young teeth it is soft, and may be broken up.
of a membranous animal substance, consisting of the cells in which each of its prisms was formed; for, as will be presently shown, the earthy matter is deposited in what might be called a set of moulds formed by the primary cells of the enamel membrane, and, as it accumulates, the membrane of the cell is so nearly removed, that in the perfect tooth no portion of it can be discerned. Its former existence however seems to be indicated by the fine close-set transverse striæ upon each prism of the enamel.

The dentine, or ivory, is composed of a hard fibrous basis of cartilage and earthly substance, traversed by very fine, branching, cylindrical tubules, which run in an undulating course from the pulp-cavity, on whose internal surface they open (see Fig. 1, 6) towards the adjacent part of the exterior of the tooth. Each tubule in its course outward makes two or three chief curves (primary curvatures). Owen, and is besides bent at every part in minute and very close undulations, or secondary curvatures; but the course of those tubules, which are adjacent to each other, is very nearly parallel. It is from the parallelism of these secondary curvatures of the tubules, that the appearance arises, as if the ivory were composed of concentric lamellæ arranged round the pulp-cavity. The chief branchings of the tubules of the dentine are divided, and close-set together (Fig. 1); but they also frequently give off minute branches, which again send off smaller ones, fill up the spaces between the trunks (Fig. 6). At the trunk each tubule has an average diameter of about \( \frac{1}{10} \) of an inch, and the distance between each two tubules is nearly equal to the width of three of them. Both the walls and the cavities of the tubules, as well as the substance between them, are filled by the earthy constituent of the ivory, which is deposited in fine granules. The basis of the intertubular substance seems to be composed of bundles of flat, pale, granular fibres, whose course is parallel to that of the tubules.

The dentine is composed of non-vascular substance, but the pulp within the pulp-cavity, and it is doubtful whether, in the human subject, fresh material is ever formed from this after the tooth has once attained its complete development. The first appearance of the pulp of each tooth is in the form of a minute process or papilla, rising from the bottom of a groove in the mucous membrane of the mouth behind the edge of the jaw. In course of time, as the borders of the groove grow around it, the papilla seems to sink into the mucous membrane; and it now appears as if rising from the base of a follicle, or of a flask-like depression, in the edge of the jaw. And lastly, processes of membrane, or opercula, grow from the sides of the mouth of the follicle, and as they approach each other and adhere by their mutually opposed edges, they gradually close it, and convert it into a capsule or sac, to the base of which the first-formed papilla is affixed. In the first-appearance tooth, the papillary state may be seen in the human embryo an inch in length; the capsular stage is completed at about the fifteenth week of embryonic life.

These three stages of the formative organs of the tooth, namely, the papillary, the follicular, and the capsular, being completed, the substances of the tooth itself begin to be produced. The dentine is developed from the papilla, which gradually assumes the form and relations of the proper tooth, and serves as the proper tooth, and is a portion of the enamel, from a special organ developed at that part of the capsule which is opposed to the papilla; and the bone probably from the interior of the capsule itself.

The papilla and the sac both gradually increase in size, but the growth of the latter is at first more rapid than that of the former, and the space between them is thus enlarged. Within this space there is deposited from the wall of the sac a soft, granular, non-vascular substance, the enamel-organ, or, as Mr. Hunter (Natural History of the Tooth) termed it, the intertubular. And at the same time as this is being produced from the interior of the sac, there is formed on the surface of the papilla a peculiar structureless membrane, which has been called the \textit{pre-formative membrane}, and which, when the papilla begins to ossify, presents numerous little elevations and depressions, on which the enamel fibres are afterwards fixed; for as the papilla enlarges, the pre-formative membrane comes in contact with the enamel-organ, and they are exactly moulded to the one upon the other.

Both the papilla, or as it may now be called, the pulp, and the enamel, are composed of primary cells (\textit{Nutrition}), and it is by the transformation of these that the tubules of the dentine and the fibres or prisms of the enamel are several. The enamel is composed of fine, parallel, and nearly parallel fibres, whose diameter is not yet known. All that can be seen is that the superficial cells of the pulp, which are at first round or oval, and nucleated, assume the same diameter and direction as the trunks of the dentine tubules, and their early nuclei remain there around them. And these changes go on gradually from without inwards, as fast as the elongated and branching cells of one layer are ossified, those of the layer beneath them become elongated, and the change; and so on, till a great part of the pulp is hardened. It is due to this gradual ossification of the pulp from without inwards, that in growing animals, to whom madder is alternately given and omitted in their food, the dentine is round to consist of alternate rings of red and white ivory; for while madder is being taken, all the earthy matter that is deposited in the most superficial layer of the unossified pulp-cells is dyed by its colouring principle, and when it is discontinued this same material is deposited uncoloured in the layer of cells which is adjacent to that already ossified and reddened. When nearly the whole of that part of the pulp which was formed in the original papilla is thus hardened by the deposition of earthy matter, its base begins to grow in one or more conical processes, and by a hardening of these processes, through the pulp, which has been described, the fangs are formed, and the tooth rises to the surface of the gum.

In the formation of the enamel, the primary nucleated cells on the inner surface of the enamel-organ become elongated and cylindrical, or prismatic; they assume a direction which is perpendicular to the surface of the hardening pulp; and then, their nuclei disappearing, they also are hardened by the deposition of earthy matter within them, which is continued till they are inseparably compacted, and their original membranous wall is not discernible. These changes also, like the preceding, make progress in layers; but the progress is here from within outwards, and it goes on till nothing is left but a thin external enamel-membrane, which forms the outer covering of the tooth. As the enamel organ and the papilla, both growing and hardening, approach more nearly to each other, the pre-formative membrane also disappears. By the transformation of this enamel-membrane, or of the superficial part of the capsule itself, that part of the bone is produced which envelops the enamel; and by similar changes in that part of the capsule which has grown in company with the fung-processes of the pulp, that part of the capsule which forms the bone itself is produced. The changes in this part of the process are probably exactly similar to those through which new bone is produced between a periosteam and the old bone which it surrounds.

**TEETH OF WHEELS.** [Wheels.]

**TEPLIS.** [Tylus.]

**TEPZA.** [Marocco.]

**TEGEA.** [Arcadia.]

**TEGERNSEE, THl.** is a lake in the circle of the Isar
in the kingdom of Bavaria, about thirty miles from Munich, at the foot of the Bavarian Alps. It is about four miles long, one mile and a quarter broad, and 300 feet deep. This lake gave its name to a Benedectine abbey, which was founded by the Agilolfingers, in the time of King Pepin, was destroyed by the Hungarians, restored in 1797, and not abolished till some years after the beginning of this century. The abbots were princes, and had four hours in their house, to which were held by noblemen. The late king of Bavaria, Maximilian Joseph, had the abbey converted into a fine palace, which he presented to his consort the late Queen Caroline, with the lordship depending on it, which is about 63 square miles in extent, including the village of Tegernsee, with 300 inhabitants. This palace is situated in a beautiful country surrounded with lofty mountains, among which the Waldberg and the Setzberg are sometimes illuminated when there are royal visitors at the palace. The grounds are laid out with great taste, and the village church is very handsome, and contains some fine paintings. In the vicinity there are quarries of fine marble of various colours, and the mineral springs of Kreuth and Schwaighof. Kreuth is in a very romantic situation, at the foot of high mountains, and is much frequented for its sulphureous waters. Near Tegernsee naphtha is found, which is here called St. Quirinus oil, because it was formerly pretended that it issued from the corpse of St. Quirinus, to whom a chapel in the vicinity is dedicated. (Hausel, Geographie; Stein, Geographisches Lexicon; Cannabich, Lehrbuch der Geographie; Hübner, Zeitungs-Lexicon.)

TEIERNAN, or TEHRAN. [Persia.]
TEHUACAN. [Mexican States.]
TEHUANTEPEC. [Mexican States.]
TEIGNMOUTH. [Devonshire.]
TEIGNMOUTH, JOHN SHORE, LORD, was the eldest son of Thomas Shore, Esq., sometime of Melton in Suffolk, and of his wife Dorothy (other authorities say Deborah) Shepherd. The family was originally of Derbyshire, Lord Teignmouth's great-grandfather having been a son of John, the first of that name, who was knighted on 8th of July, 1667. Lord Teignmouth but was born, it is believed, in Devonshire, October 8, 1751: his father died in 1759, his mother in 1783, and his only brother, the Rev. Thomas William Shore, who was vicar of Sandal in Yorkshire, and of Otterton in Devonshire, in 1822.

Lord Teignmouth went to Bengal in 1789, as a cadet in the Company's civil service, and was first stationed at Moorshedabad as an assistant under the council of revenue. In 1773 his knowledge of that language procured him the appointment of Persian translator to the Provincial Council of Moorshedabad; and this was followed the next year by a seat at the Calcutta revenue board, which he retained till the dissolution of the board in 1791, when he was appointed second member of the general council of revenue, which was established by the new charter granted that year. While holding this situation, Mr. Shore lived in terms of intimacy with Warren Hastings, the governor-general; and when Hastings came home in 1783 he accompanied his friend to England. During this visit to his native country he married Charlotte, only daughter of James Cornish, Esq., a medical practitioner at Teignmouth; and a few weeks after, in April, 1796, he set out again for Calcutta, having been appointed temporary secretary to the council of revenue under the new governor-general Lord Cornwallis. To his activity and ascendency in the council is mainly attributed the adoption of Cornwallis's great measure, the new settlement, in 1793, of landed property in the presidency of Bengal, by which the zemindars, hitherto only the revenue agents or tax-gatherers of the government, were made the hereditary proprietors of the estates which they farmed, and the ryotas, or peasants, who had till now a large share of the burden of taxation, were declared the tenants of the zemindars, and made removable at the will of their landlords. The new judicial system which was introduced towards the close of Lord Cornwallis's government in 1793, also owed its establishment to the governor-general's desire of converting the ryotas, who had been made a baronet the preceding year. On the retirement of Cornwallis, in August, 1793, Sir John Shore was appointed to succeed him as governor-general; and he held that high office till the close of the year 1797, when he resigned it to the earl of Mornington, and was created an Irish baronet by the title of Baron Teignmouth.

Upon the death of Sir William Jones, in April, 1794, Sir John Shore was elected president of the Asiatic Society; and taking his seat in that capacity on the 23rd of May, he delivered a discourse on the merits of the late president, which is printed in the fourth volume of the Society's Transactions. After his return home Lord Teignmouth was appointed one of the members of the Committee of the Asiatic Society to make a report on a memorial of the Life, Writings, and Correspondence of Sir William Jones; and in 1807 he produced an edition, in 4 vols. 8vo, of Jones's Works, with this Life prefixed. Lord Teignmouth had been succeeded as president of the Asiatic Society by Charles D'Aguesseau, in 1804, on the formation of the British and Foreign Bible Society, Lord Teignmouth was elected its first president and this situation he retained till his death, though for some years before that event he was obliged to devolve some of his duties upon his successor, Lord Bexley. In the prospect of the Society he at all times took the liveliest interest.

On the 4th of April, 1807, Lord Teignmouth was appointed one of the commissioners for the affairs of India, and on the 6th, the board of control sat on the 8th of the same month he was sworn of the Privy Council. He retained his seat at the Board of Control for some years; and his death took place on the 14th of February, 1835.

Books and publications already mentioned, Lord Teignmouth is the author of 'A Letter to the Reverend Dr. Wordworth, D.D., on the subject of the English Society,' 8vo, London, 1810; and 'Considerations on the unity of the inhabi- tants of India the mass of the Christians,' 8vo, London, 1811. ('Memphis,' p. i., p. 532.)

TIÉSSIER, ANTOINE, was born at Montpellier, 26th January, 1632. His family, which was originally from Nimes, was of the French race, his father wasriding in general of the province of Languedoc; but he resigned of that appointment, and also of whatever else he possessed, a few months after the birth of his son, for having joined the revolt of Henri, Duc de Montmorenci, was least given up to him the public money which was in his hands. Montmorenci was taken prisoner at the battle of Castelnaudari, on the 1st of September, 1622: his father was executed, and on the 30th of October he was beheaded. After the ruin of his family he was appointed auditor of the clear revenue for the province of Languedoc, 1632, and 1636, and was appointed for the ministry of the Protestant churches; and with that view he studied theology for some time in the Protestant seminaries of Nimes, Montauban, Sertan, and in the end he made up his mind to adopt the profession of Calvinism, which it was impossible for him to do, as he was condemned by the state. His bodily strength however proved to be no more sufficient for the bar than it had been thought to be for a pulpit; and after some time he gave up his profession, and took to literature as a means of subsistence.

TIÉSSIER was a tertian refugee in Switzerland, having, according to the 'Bibliothèque Universelle,' although in extreme distress, declined very tempting proposals which were made to him by the chancellor D'Aguinse, to induce him to return to France. But it would not do to doubt the tradition that he should abjure Protestantism. He supported himself chiefly at first by publishing a French newspaper at Brest, then by giving a course of public law (droit public), which he paid their schoolmaster also brought him something. At length, in 1625, he was invited by Frederic III., elector of Brandenburg (afterwards king Frederic I. of Prussia) to come to Berlin and there he resided till his death, on the 7th of September, 1686. In 1654 he had been elected a councillor of state, and appointed to the office of historiographer; and part of his time was also occupied for some years in superintending or directing the education of the hereditary prince, afterwards Frederic William
I. A complete list of Teissier's numerous publications is given in the Bibliographie Universelle. The most celebrated among them is his Eloge des Hommes Savans, livres de l'Histoire de M. de Thou,' first published at Lyon and at Geneva, in a 12mo. volume, in 1683; then at Utrecht, in 2 vols., in 1686; and again at Leyden, in 4 vols., in 1692. In the two latter editions the text of De Thou is accompanied by numerous annotations, which display much curious research. Teissier was an accurate inquirer; but there is no artistic quality or vital power in any of his books, and all of them, even including his 'Eloge des Hommes Savans,' were succeeded and nearly forgotten. One of the most creditable is a Catalogue, in Latin, of the authors who have written catalogues, indexes, &c., in two parts, 4to., Geneva, 1685 and 1705; some other relates to parts of the history of Prussia; and a few are tracts or treatises, which have the character of being generally faithful enough, but of little elegance or spirit, from St. Clement, St. Chrysostom, Calvin, Slein, and other Greek and Latin writers, the latter mostly, if not exclusively, moderns.

TEIXEIRA. [Teixeira.]

TEJEN. [Presia.]

TEJUCO. [Brazil. p. 368.]

TEJUS. [Sauvegarde.]

TELE. [Savasande.]

TELEGRAPH (from τάγμα, 'distant,' and ἡγομία, 'write'), a machine or contrivance for communicating intelligence to a distance, usually by means of preconcerted signals, to which some conventional meaning is attached. On account of their simplicity, these means of telegraphic communications may be better for their impenetrable secrecy as for their rapidity. The name semaphore (from σήμα, 'a sign,' and μήδα, 'bear'), is commonly applied to some of the machines which are adopted for this communication; which, in an extended sense, may be considered to embrace every means of conveying intelligence by gestures and visible signals, as flags, lanterns, rockets, blue-lights, beacon-areas, &c., or by audible signals, as the firing of guns, bells, trumpets, the beating out of drums or gongs, &c., as well as by the machines called telegraphs or semaphores.

Although telegraphic communication, as a means of conveying any required intelligence, is an invention of remote date, the use of signals for the speedy transmission of such brief messages as might be previously arranged between persons, is a practice derived from the most remote antiquity. The use of beacon-fires, for example, as a means of giving speedy warning of the approach of an enemy, is alluded to by the prophet Jeremiah, who wrote about six centuries before the Christian era, and who warns the Benjaminites to 'set up a sign of fire in Beth-haccerem; for evil,' he adds, 'appeareth out of the north, and great destruction is going by.' (Jeremiah, x.) The fine description given by Strabo, in his 'Agamemnon,' of the application of a line of fire-signals to communicate the intelligence of the fall of Troy, is often referred to as an early instance of this kind of telegraphic dispatch; but if it is meant for a writer, and not of the event, referred to, the passage above quoted affords an earlier illustration. This simple means of spreading an alarm, or communicating intelligence in time of war, is practised by many nations; and, to come nearer home, we may refer to the graphic stanzas of the 'Lay of the Last Minstrel' (canto iii., st. xx.-xxix.), descriptive of the rapid communication of the approach of the English forces from the border stations; along 'height, and hill, and cliff,'—

'Till high Dunediel the blazes wave,

From Erskine to Dundrennan, Law I.

And Lusithan heard the Regent's order,

That all should be ready for the borders.'

In a note illustrative of this description, Scott refers to an Act of the Scottish parliament in 1450, c. 48, which directs that one bale or faggot shall be warning of the approach of the English in any manner; two bales, that they are coming indeed; and four bales blazing beside each other, that the enemy is in great force. Such signals, though best adapted to give information by night, were also available in the daytime, when they appeared as columns of dense smoke. Torches held in the hand and moved in any particular manner, or alternately displayed and hidden behind a screen, were also used in ancient times as signals, as we learn from several early writers on military subjects; but as they were merely arbitrary signals, which admitted of very little variation, such devices could only be rendered available by previous consent.

That some attempts were made by the antients to improve upon such simple signals is evident from the tenth book of Polybius, in which allusion is made to a device of Xenias (Tacit. ii.), who proposed to write several sentences, such as it might be desirable to communicate, upon two oblong boards, each of which was kept by each of the parties. These boards were to be affixed to cork floats capable of rising and falling in cylindrical vessels, each one of which was placed at each station. Matters being thus prepared, and the vessels filled with water, the person desiring to send intelligence allowed the water to escape from his vessel by a small opening until the suitable sentence on the inscribed board had sunk, and then to float the torch signals to indicate the moment of allowing the water to run out, and that at which the board sank to its proper level. The person at the distant station regulated the egress of water from his vessel by the torch signals, and was thus enabled to ascertain which of the sentences written on the board conveyed the required intelligence. Complicated as was this arrangement, it afforded very little more scope than the use of simple torches or fires. Polybius however describes a much more perfect method of telegraphic communication, which, he says, was invented either by Cleoxenus or Democritus, but improved or perfected by himself. This method is capable of communicating any required intelligence with the greatest precision; the signals being made to represent the letters of the alphabet, and the message being displayed letter by letter. Instead of quoting the description of Polybius himself, which refers to the use of the Greek alphabet, we shall adopt that of Bishop Wilkins, who describes the plan as applied to the English alphabet. The alphabet must be divided for this purpose into five portions of five letters each (excepting the last, which has but four), and r and f being omitted as unnecessary, and inscribed upon tablets, as in the following diagram:

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<table>
<thead>
<tr>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>a</td>
<td>f</td>
<td>q</td>
<td>t</td>
</tr>
<tr>
<td>2</td>
<td>b</td>
<td>g</td>
<td>m</td>
<td>r</td>
</tr>
<tr>
<td>3</td>
<td>c</td>
<td>h</td>
<td>n</td>
<td>s</td>
</tr>
<tr>
<td>4</td>
<td>d</td>
<td>i</td>
<td>o</td>
<td>t</td>
</tr>
<tr>
<td>5</td>
<td>e</td>
<td>p</td>
<td>u</td>
<td></td>
</tr>
</tbody>
</table>
```

This being done, each of the corresponding parties is to provide with a copy of the tablets, and also with ten torches, five of them on the right hand and five on the left. Any letter may then be expressed by first lifting up on the right hand so many torches as may indicate the number of the letter in which it is contained, as i., ii., iii., &c., and then so many on the left as may show the number of the particular letter in the tablet, as 1, 2, 3, &c. Thus the word husten would be expressed by displaying the torches six times, in the following order—

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I. s
II. t
III. n
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Polybius observes that dioptrical instruments, framed with two hollow tubes, afford an observer to distinguish accurately the right and left hand lights; and that solid fences should be erected upon each side, behind which the torches might be concealed when out of use. Bishop Wilkins, in his curious work entitled 'Physico-Medicinal History,' and adopted after describing this telegraph of Polybius, mentions another which requires only three lights or torches. The twenty-I
four necessary letters of the alphabet are, according to
to this plan, by which it gives on the authority of Joachimus
Fortius, to be divided into three classes of eight letters
each. The first class is represented by one torch, the
second by two, and the third by three; and the number of
the letter by the number of times of which the torches
were elevated or discovered. Thus one torch raised once
would represent a, or raised eight times, A; two torches raised
once would indicate b, raised twice, k; or eight times, q;
and three torches raised from once to eight times would
place the remaining letters, from r to z. Similar to this,
but still easier of application, is the night-telegion con-
trived by the Rev. James Bremner, of the Shetland
Islands, and rewarded by the Society of Arts in 1810. A
single light constitutes the whole alphabet of this plan, and
is raised or lowered in its alternate exhibition and
recessions. The alphabet is divided into four classes
or divisions, of six letters each; and the number of
obscuration is to indicate, first, the number of the division,
and secondly, the number of the letter in that division; a
pause being made between the obscurations which indicate
the number of the division and those which show the
number of the letter in that division; and a longer pause
between the double set of movements thus required for
every letter, one throughout the whole of which the letter,
and the other the number of the letter, might in some
cases be used; but Mr. Bremner conceives that, especially
in long distances, one is preferable, as affording less risk of
error. His method had been found serviceable for distances
of three miles and upwards, and had been successfully
put in operation between the lighthouse on Copeland
Island and Port Patrick on the opposite side of the Irish
Channel. Further particulars respecting this, and a de-
scription of another telegraphic system, twice, by the same
author, are given in the thirty-fourth volume of the
society's 'Transactions,' pp. 213-227. Tidious as Mr. Brem-
ner's method may appear, it is stated that, supposing the
whole alphabet to be used, sixty letters might easily
be given, whereas while the telegraph might be
affected more rapidly, if, as in some telegraphic systems,
only sixteen letters were used. In addition to the al-
phabetic systems which depend merely upon the number or
alteration of dots and commas of lights, Bishop
Pecher describes one which depends upon the relative posi-
tions of two lights attached to long poles, and which, he
says, 'for its quickness and speed is much to be preferred
before any of the rest. It will thus be perceived that
that ingenious writer came very near to the principle upon
which many of the modern telegraphic systems depend.
In suggesting the use of extended lines of telegraphic
communication, he further hints at the application of the
teleoscope (or, as he styles it, 'Galileus his perspective'),
to the deepening of distant signals.

Among the scientific writers who seem to have had
some notion of the modern telegraph are Kircher, Schottus,
and Kessler; the latter of whom proposed to cut out such
characters as it was desired to show in the ends of a case,
which was to be elevated with a light enclosed in it. The
Marquis of Worcester also, in his 'Century of Inventions,'
1683, announces, 'How at a window, as far as the eye can
discover black from white, a man may hold discourse with
his correspondent, without noise made or notice taken,'
&c.; and again, 'A way to do it by night as well as by
day, though as dark as pitch is black.' The earliest well-
designed plan of telegraphic communication appears how-
ever to have been described in a publication addressed to
the Royal Society in 1684, by Dr. Robert Hooke, and
published in 1726 in Dr. Hooke's collection of his 'Philosophical
Experiments and Observations,' pp. 142-150, 'showing a
way how to communicate one's mind at great distances.'
Hooke states that he had observed, in the sun's disc, years
before, but that the then recent siege of Vienna by
the Turks had revived the matter in his mind. His scheme
will be readily understood by the annexed cut, Fig. 1,
which represents an instrument supporting a paper or screen, a, behind which were to be suspended a number
of symbols or devices, formed of deal planks, of the
various shapes represented by the small black figures.
The first twenty-four of these, which consist entirely of
dots and commas, are used for the characters of the alphabet; the six devices consisting of curved lines were to be used
as arbitrary signals. Whenever it was desired to display
any of these characters, they were to be drawn from be-

![Fig. 1](image-url)

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stations, so chosen that, if possible, there might be no
interference of atmosphere to impede vision, and so that
there was no intervening objects or disturbed background
might interfere with the clearness of the prospect; and
telescopes were to be used by the observers. The order
of connection between the signs employed and the letters
of the alphabet might, it is explained, be infinitely varied
for the sake of secrecy; and none of the parties employed
excepting those at the terminal stations, need have any
knowledge of the message communicated. Hooke first
proposed a scheme for night communication by means
of lights disposed in a certain order. About twenty
years after the date of Hooke's paper, Aumont brought to
ward a very similar plan in France, and made public use
of his contrivance before several persons of rank. Some
other individuals subsequently devised similar schemes,
but nothing was effected in the practical application of
telegraphic communication until the war of the French
revolution. Macdonald states that, 'Following the princi-
bles laid down by Dr. Hooke, in 1684, Dupuis, in France,
invented the French telegraph, which Don Guibert, a
monk of the order of Cistercian, also in 1741, modified, and
proposed to Condorcet, Milli, and Dr. Franklin, who rec-
nomended it to the French government.' The telegraph
taken into use in 1793 or 1794, by M. Chappe, was, u
will be seen by fig. 2, a very superior machine to that
of Dr. Hooke.

![Fig. 2](image-url)

Chappe's telegraph, which, from its position when
rest, is sometimes called the T telegraph, consisted of
an upright pole or post, at the top of which was
placed, by its centre, a transverse beam, which, by means
of ropes worked in the chamber below, that served also for an
observer, served to raise or lower the signal lamp or figure
with the post. Each end of this movable beam carried
a short arm, which was capable of assuming any required
angle with it; and these arms also were worked by ropes
which were conducted through the axis of the beam so
that the necessary degree of tension might not be
disturbed by the action of the machine. By this con-
trivance, without the use of any angles of less than 45°
which might be indistinct when viewed from a great
distance, or under the influence of a refractive atmos-
phere, as many as 206 different signals might be made.
A much smaller number was however sufficient, as M. Chappe
communicated his intelligence letter by letter, and sim-
sified the movements by using an alphabet of only six
letters. The small figure in the cut shows some of
the different positions assumed by the beam and arms,
and, as the connection between these and the letters then
were made to represent was quite arbitrary, their signifi-

---

*Fig. 1*

*Fig. 2*
tion might be changed as often as was necessary for the purpose of secrecy; it being only necessary that the key should be known to the parties sending and receiving the message, although it might be transmitted through a great number of intermediate stations. Such telegraphs were first erected on a line commencing at the Louvre, in Paris, and proceeding by Montmartre and other elevated points to Lisle, in order to communicate between the Committee of Public Welfare and the combined armies in the Low Countries. Telescopes were used at each station, and the signals displayed at one station were immediately repeated at the next; four seconds being found sufficient for effecting the required motions, and sixteen seconds the time allowed for observing and noting down each signal, during which the machine remained stationary. Barère, in announcing the invention of the telegraph to the Convention, on the 17th of August, 1794, stated that the news of the recapture of Lisle had, by means of this machine, reached Paris in an hour after the troops of the republic had entered that place. (Annual Register, 1794, p. 51.)

The advantages of such extraordinary celerity of communication were so obvious that, in England and other countries, many plans were immediately brought forward, some of which differed materially from that which had been successfully put into practice in France. Among these was that contrived by Mr. R. L. Edgeworth, who states that he had made experiments as early as 1797, when he proposed to use the sails of a windmill as a means of conveying intelligence by signals. The report of Chappis's telegraph revived the matter with him, and late in 1794 he, with some friends, tried experiments with a numerical telegraph (or a telegraph expressing numbers, which numbers refer to letters, words, or sentences, in a dictionary), on the principle shown in the cut Fig. 3. An index, or pointer, in the form of an isosceles triangle, was so mounted upon a post, or on a portable triangular stand, that it might be turned into any of the eight positions shown in the upper part of the cut; these positions indicating, respectively, 0 and the numerals 1 to 7. Four such pointers, mounted side by side, as in the lower part of the figure, afford power for expressing any number from 1 to 7777, excepting 6, 9, 18, 19, 28, 29, and all others in which the numerals 8 and 9 are required: the first pointer representing thousands, the second hundreds, the third tens, and the fourth units. Thus the four black pointers in the figure, being, respectively, in the positions indicating 2, 7, 7, and 4, express, collectively, the number 2774. The numerical system affords at least equal facilities with the alphabetical or lettering plan for secrecy in the communications, since the connection between the numbers expressed and the sentences which they refer may be changed at pleasure, and none of the persons employed in transmitting the intelligence need to possess the dictionary, the number being all that they require to know. In reference to this distinctive feature of his plan, Edgeworth observes that, while 'telegraph' is a proper name for a machine which describes a distance, telelograph, or, contractedly, telegraph, is a proper name for a machine which describes words at a distance; and therefore he uses the latter term. In his Essay on the Art of Conveying Secret and Swift Intelligence, published in the eighth volume of the Transactions of the Royal Irish Academy, in which the details of his plan are fully given, Edgeworth shows the great advantages derivable from the application of the telegraph to commercial and other general purposes, as, for instance, to the speedy announcement of market-prices at a distance; and even hints at the possibility of a line of telegraphs between Europe and the East Indies. He also published a pamphlet entitled 'A Letter to the Right Honourable the Earl of Charlemont on the Tellograph, and on the Defence of Ireland,' which was reprinted at London in 1797.

Another of the individuals whose attention was directed to this subject by Chappis's telegraph, was the Rev. J. Gamble, then chaplain to the Duke of York. He issued a thin quarto pamphlet, without date, entitled 'Observations on Telegraphic Experiments,' in which, after noticing several suggestions which had been made for effecting rapid communication, he propounds another, of which he believed himself to be the inventor. The apparatus which he proposed consisted of a frame-work containing five boards, or shutters, arranged vertically one above the other, and pivoted in such a way that any or all of them might be closed, so as to present their broad surfaces to the eye, or opened, so as to present merely a thin edge, which would be invisible at a distance. The various signals produced by closing one or more of these shutters may be applied either to a numerical or an alphabetical system. A similar plan submitted to the Admiralty in 1795, by Lord George Murray, was adopted in the first government line of telegraphs established in England, in 1796, between London and Dover. The 'Annual Register' for the year (p. 4 of the 'Chronicle') mentions the erection of the telegraph over the Admiralty on the 28th of January, and states that information had been conveyed from Dover to London in seven minutes. The action of this kind of telegraph, which was continued in use by the Admiralty until the year 1816, is illustrated by Fig. 4, in which A represents a square frame-work with six octagonal shutters, 1, 2, 3, 4, 5, and 6, arranged in two vertical columns, or sets, and turned into a vertical position, so as to display their broad surfaces completely, and B represents the same apparatus with the boards or shutters placed horizontally, or turned one-quarter round upon their respective axes, so as to present nothing but their edges to the eye. The central space between the two columns of shutters serves to render them more distinct at a distance, however, and affords room for the ropes and pulleys by which the telegraph is worked, and which are managed by persons in the observatory below. As shown by the following table, the six-shutter telegraph is capable of expressing sixty-three different signals, by closing one, two, three, or more of the shutters, according to the Arabic numerals in the table, which refer to the numbers inserted in the cut Fig. 4. A. The position of the apparatus shown in Fig. 4, B, is not counted as a signal; it being the position of rest.

<table>
<thead>
<tr>
<th>Signals</th>
<th>Shutter Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>1</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>2</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>4</td>
<td>1 2 3</td>
</tr>
<tr>
<td>5</td>
<td>1 2</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

These signals afford the means of expressing each letter of the alphabet, and each of the Arabic numerals, by a distinct and simple sign, and still leave several signs unappropriated, which may be applied to words or sentences of common use, or to arbitrary signals; and the construc-
to between the signals given in the table and the letters or numerals they represent may be varied almost infinitely; at least, in time of war, that key in a few minutes to fall into the hands of the enemy might be immediately changed.

In a modification of this kind of telegraph, intended for night as well as for day service, which was submitted to the Society of Arts, in 1803, by Mr. Joseph Davis, a seven-shutter apparatus, which consisted of being contrived, so that on an horizontal axis, is made to slide up and down in grooves in the centre of the framework; so that it may either range with the shutters 1 and 2, 3 and 4, or 5 and 6, or, if not required at all, may descend into a space provided for that purpose by the observer; there being a device the power of the machine is quadrupled; it being rendered capable of making the sixty-three signals shown in the table without the sliding-shutter, and the like number with it in each of its three visible positions, or two hundred and fifty-two changes in the whole.

About the same time that shutter-telegraphs were being introduced in England, the Chevalier A. N. Edelcrantz, of Stockholm, was devising similar machinery for use in Sweden. In 1796 he published an account of his experiments and inventions in the Swedish language, which in 1801 was translated into French and published at Paris, and was noticed in Nicholson’s ‘Journal’ in 1803. A few years later Edelcrantz communicated a model of his apparatus to the Royal Society of Arts, in whose ‘Transactions’ for 1808 (vol. xxvi., pp. 184-189), it is minutely described. He commenced his experiments in September, 1794, with a machine resembling that first employed in France, with the exception that he adopted a single shutter-telegraph with ten boards or vanes, arranged in three vertical ranks, of which the centre one has four, and the others three boards each. By this arrangement 1024 changes or signals may be clearly shown; and it would be possible, by observing the order in which the shutters are exhibited, to show 4,037,012 changes. The minute attention required in this case would, however, occasion some uncertainty; and it is not likely that any circumstances could render any changes desirable. Edelcrantz recommends that the vanes or shutters, which are represented as of a square form, should be painted black, and the frames which support them either white or red; and he says that the intervals between the shutters should be greater than their diameters. The apparatus for working the telegraph is ingenious, but too complicated for description here. It is sufficient to state that, when out of use, the shutters are held open by weights, and that the leverage afforded by the apparatus for closing them is such as one man to hold them all, it necessary, against a high wind, which, it is added, could not be done with the English six-shutter telegraph, notwithstanding the smaller number of vanes, without employing eleven men. This innovation was led Mr. William Ward, who had observed the difficulty of working the telegraph at Blandford, in Dorsetshire, to contrive an ingenious apparatus which is described in pages 297-8 of the same volume of the ‘Transactions’ of the Society of Arts as that which contains the communication of the Chevalier Edelcrantz. In this apparatus the grooved wheel or pulley which is fixed upon the axis of the shutter, to receive the rope by which it is turned, has the grooved portion of its rim formed in two segments, which are so attached to the periphery of the wheel by steel springs that they fly off and remain at a little distance from it when there is no strain on the rope; although, so soon as the rope is pulled, its pressure forces the segments into close contact with the solid rim of the wheel. In the segments are formed two notches, which, when the shutter is in either of its required positions, engages with a fixed catch so soon as the strain on the rope is relaxed, and so hold the shutter steady without any aid from the attendant. The pulling of the rope, by drawing the segments close to the wheel, releases the catch, and consequently enables the attendant to return the shutter to its original position. The ten-shutter telegraph of Edelcrantz, the modification of his letter-board machine, has been in constant use for twelve years, on both sides of the Baltic, and in other places in Sweden; chiefly in facilitating the communication of posts between Russia and Finn and the Baltic States—Sweden and Finland—on the other. He states that one person was sufficient for working it and making the observations, especially at the terminal stations; and that six signals were usually given in a minute.

Lieutenant-Colonel Donald, who greatly prefers the numerical to the spelling or lettering system, recommends a shutter-telegraph of still greater power, and consequence of greater complexity, than that of Edelcrantz. His terrestrial telegraph, the advantages of which he has pleaded at length, consists of thirteen shutters, arranged, like those of Edelcrantz, in three vertical sets, which represent, respectively, hundreds, tens, and units. As three boards in each set would only afford seven combinations for each column, he uses for each which give fifteen combinations, ten of which are used to express the numerals from 1 to 9, and the remaining five for abbreviations and arbitrary signs. The twelve ordinary boards are capable of producing 4006 distinct combinations, and the thirteenth, an auxiliary board, which is mounted over the centre of the machine, doubles that number. A flag or vane is added to the hundred side of the apparatus, to distinguish it in whatever direction it may be viewed, and a flag side: upon the staff which supports it. It orders the means of an odd, doubling the number; so that, in the whole, 16380 distinct signs may be made with this machine. Macdonald recommends that the shutters be made about five feet square, so that they may be seen with a moderate telescope, in clear weather, at a distance of ten or twelve miles.

Although the shutter-telegraph was originally considered an improvement upon that of M. Chappe, which was so much employed with abandoned success in France, unless it were worked by a practised person, experience has established the superiority of telegraphy or semaphore with movable arms; and these have been greatly amplified, so as to avoid the objection raised to the old free telegraph. Among the schemes proposed soon after the first practical application of telegraphs, was one which consisted in dividing a large circle into twenty-four parts, in the letters of the alphabet, and employing a traverse radius, or in other words, a point from out, by means being taken by the object-glass of the telescope to enable the distant observer to determine the position of the radius. The plan could only be applied to short distances, because reflection might render it difficult to distinguish between positions so little varying from each other. The radiating principle was, however, adopted in some machines of more practical character; among which was a telegraph contrived by the Rev. J. Gamble (whose original shutter-telegraph has been before mentioned), consisting of five beams or arms pivoted at the top of a post upon one axis, and capable of producing many different combinations without using angles of less than 45°. A similar principle were constructed the French coastal telegraphs adopted in 1841, in which the name of a letter was first applied, and from which it has been given to other telegraphical machines, the action of which depends upon the motion of arms around pivots placed slightly near their extremities. These French semaphore as they were sometimes called, signal-posts, consisted of upright posts with two or three movable arms, turned upon separate pivots, one above the other. Before they were much known in this country, Captain (now Rear-General) Pauley had been led to observe the invention of the common land-telegraph to that used at sea, which consisted of coloured flags, and by which three numbers rather than three numerals combined to form one number, might be readily expressed. To remedy this defect, in 1827 (before he had seen the French semaphore) devised what he termed a polygrammatic telegraph, which he published a description in the twenty-ninth volume of Tillotson’s ‘Philosophical Magazine.’ This machine, which is represented in Fig. 5, consisted of four posts.

Fig. 5.
has three pairs of arms, representing hundreds, tens, and units, pivoted to different parts of the same vertical post. This convenience is adopted by Lieutenant Colonel MacDonald, with very trifling variation, in his "Treatise explanatory of a New System of Naval, Military, and Political Telegraphic Communication," published in 1817. By the addition of a ball and vane at the top of the mast, it becomes a machine of the same power as MacDonald's thirteen-shutter telegraph; as each pair or arm is capable of assuming fifteen distinct positions. Another semaphore on the same principle was submitted to the Society of Arts in 1821, by Lieutenant N. H. Nicolas, and described, together with a method of applying a shifting key to telegraphic communications, for the purpose of insuring their secrecy, in the thirty-ninth volume of the Society's "Transactions"; where, although allusion is made, in a note, to the similar plan published by Colonel MacDonald, nothing is said of the earlier invention of Pasley. The telegraph of Lieutenant Nicolas consists of a lofty pole with four pairs of arms, one above another, the lowest pair representing units. For each of the three lower pairs of arms nine positions are all that are required, if being indicated by both arms being closed into the post, and therefore concealed from sight; but the upper pair are made to represent any number from 1 to 15, so that the total range of the machine is from 1 to 15,009.* This is effected by making the right arm represent 1, 2, or 3, according to its position as inclined upwards, extended horizontally, or inclined downwards; and assigning to the left arm the number 4 if inclined downwards, or 8 if extended horizontally. 5, 6, 7, and 9, are formed, respectively, by the combination of the signs for 1 and 4, 1 and 2, 1 and 3, and 1 and 8 and 1, 12 and 2, and 12 and 3, respectively. The telegraphs upon the commercial line of communication recently established between London and the Downs are constructed upon another modification of the polygrammatic principle; four pairs of arms being employed, but mounted upon two posts instead of one, as in the semaphore last described, or four, as in the original design of Captain Pasley.

In 1816 it was determined to change the Admiralty telegraphs into semaphore constructed on the principle of those used in France, with the improvements suggested by Sir Home Popham, who had previously done much for the improvement of naval signals. The action of Popham's semaphore is explained by Fig. 7, in which dotted lines are added to show the various positions in which the arms may be placed, and numerals to show the numbers forming more than nine figures. Only two arms are employed; but as they are mounted upon separate pivots, each of them can assume six different positions, and the two together are capable of affording forty-eight signals; which number, though less than that given by the six-shutter telegraph, is sufficient to express the letters of the alphabet and the Arabic numerals, and to leave thirteen signals unappropriated, for abbreviations and arbitrary signs. This kind of semaphore is still used at the government stations; and for the following table of its various changes or positions, and of the letters and numbers indicated by them, we are indebted to the article "Telegraph," in the seventh edition of the "Encyclopædia Britannica," by Sir John Barrow, one of the secretaries to the Admiralty.

Table of the separate or distinct Signals given by the Adm irality Telegraph, with their respective Significations.

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Sir Home Popham's telegraph, in addition to its superiority in the important quality of simplicity, was a great improvement upon those which preceded it in the details of mechanical construction and in the mode of effecting the required movements. These are minutely detailed and illustrated with engravings, in the thirty-fourth volume of the "Transactions" of the Society of Arts, in whose museum a model of the telegraph is deposited. The vertical post or beam is not a solid mass of timber, but a hollow hexagonal mast, which, turning on a pivot at its foot, and in a collar where it passes through the roof of the cabin used as an observatory, may be moved so as to display its signals in any direction. The moveable arms are provided with balance weights in the form of masses of metal attached to their shorter ends, very near to the pivots upon which they turn, by which means they are enabled to move in any direction with the exertion of a very small force; and they
re made, when out of use, to fall into grooves or recesses in the post, so as to become wholly invisible. The movements are effected by means of two winch-handles near the base of the mast, within the cabin, one for each arm. The winch-handles turn two small vertical bevel-wheels, which communicate motion by means of two horizontal bevel-wheels to long upright shafts or rods, which pass up the inside of the hollow post of the telegraph. At the upper ends of these rods, which are held steadily by suitable bearings, are endless screws, which work into toothed wheels fixed upon the axes of the arms, and thereby communicate motion to them. In order that the person who works the machine may know precisely when the arms are brought to the required positions, similar endless screws are arranged at the other ends of the vertical rods, to give motion by toothed wheels to indexes, which give a miniature representation of the motion of the arms. Excepting these indexes and the winch-handles, the whole apparatus is enclosed in the vertical shaft of the telegraph, on the outside of which small blocks may be added, to enable a person, with the assistance of a rope from the top of the post, to ascend the machine for the purpose of cleaning and oiling it.

About the same time Sir Home Popham proposed a modification of the semaphore for marine purposes, which, he conceived, would be found very advantageous for the merchant-service, by superseding the necessity for a costly set of expensive rope wear and fear of which formed a serious objection to a system of generic telegraphic communication at sea, excepting in the ships of the East India Company. His proposed sea-telegraph would not, it is stated, cost more than fifty shillings at first, and would in some amount to fixed expenses a year. As the height of an apparatus resembling his land semaphore would be objectionable for marine purposes, Popham proposed to use two posts twelve feet two inches high and six inches thick, each having a single arm six feet four inches long and ten inches broad, pivoted at the top, but not falling into a slot in the post, as in the last-described machine. In a small slot at the top of each post is a grooved pulley or sheave fixed upon the same arm, as this arm; and at a convenient height from the bottom of each post another precisely similar pulley is mounted in like way, its axis passing through the post, and carrying a small wheel with four handles at right angles with each other, by which the machine is worked; the motion of the lower pulley being communicated to the upper one, and consequently to the arm, by an endless rope, which has two or three turns round each of the sheaves, and passes up by the sides of the post. When the telegraph is in use, the post pulleys are attached to the side of the telegraph, by slipping their lower ends into blocks fixed for the purpose, and lashing them to the bulwarks; or they may be mounted upon trucks, so as to be readily moved from one part of the ship to another. The description of this in Sir Home Popham's communication to the Society of Arts mentions but four positions for each arm, and states that when placed in the four positions diagonally to the post, one arm denotes 1, 2, 3, and 4, and the other 5, 6, 7, and 8. This arrangement gives twenty-four distinct signals, and avoids the possibility of mistaking the horizontal for an inclined position of either arm, of which there might, owing to the motion of the ship, be some risk.

Major-General Pasley, in a pamphlet published in 1823, entitled 'Description of the Universal Telegraph for Day and Night Signals,' states that, although he at one time considered Popham's arrangements to be judicious, he now deems the use of two separate pivots in the land semaphore, and of two posts in that for marine use, unnecessary; and that, conceiving simplicity to be of more consequence than the power of making many changes or distinct signals, he has abandoned the polygrammatic principle, and adopted the simple system shown in the next cut, Fig. 8, which represents what he styles 'universal telegraph,' as adapted for day-service. It consists of an upright post with two arms, both attached to one pivot at its upper extremity. Each arm is capable of assuming the several positions at which it is shown in the table, below, each occupying half of the width and half of the length of the arm. The ingenious contrivances which have been suggested for effecting telegraphic communication are so very numerous, that anything like an enumeration of them
impossible in this place. Several depend upon the application of various forms to a semaphoretic telegraph. A two-armed telegraph, of which the two arms are differently shaped, would be capable of making twice as many signals as a two-armed, telegraph with both arms of the same form; but, for ordinary purposes, such an arrangement would be more expensive. A three-armed character, contrived by Mr. Alexander Law, for both land and sea service, is described in the thirty-third volume of the 'Transactions' of the Society of Arts. Another class of telegraphic contrivances depend upon the exhibition, to the eye of the observer, a character, in a manner somewhat resembling the original contrivance of Dr. Hooke. Of this sort Macdonald describes one under the name of the 'symbolic telegraph,' in which symbols resembling those of Hooke, but representing numerals instead of alphabetic characters, are dropped from three boxes or screens into as many open spaces, which have the values of hundreds, tens, and units respectively. An auxiliary shutter, a ball, and a vane or flag, as in his shutter-telegraph, serve to increase the powers of the machine at pleasure. Another contrivance, which, like the last mentioned, is well adapted for a telegraphic telegraph for use in moderate distances, was invented about the year 1817 by Mr. Conolly, and described by him in a pamphlet published in that year, in the 'Transactions of the Society of Arts.' The 'Telegraphic Communication,' and also in the thirty-sixth volume of the 'Transactions' of the Society of Arts. Conolly's 'Portable Telegraph' consists simply of three square boards painted with the alphabet in black and white, as shown in Fig. 9, the colours on one side being the reverse of those upon the other. The six figures in the upper row

![Fig. 9.](image)

were produced upon three boards, and each of these six figures is capable of producing four different signals, by turning each side of the board downwards in succession, as shown in the four devices at the lower part of the cut. Thus the three boards afford twenty-four distinct signals, which are sufficient for alphabetic communication; and one only is sufficient for making numerical communications, with the assistance of a smaller paddle-shaped board, the two miles of which, when it is used separately, denote affirmation or negation. In experiments made at Bath, boards but eighteen inches square were found sufficient for a distance of two miles, with a telescope with a magnifying power of twenty-five; and Mr. Conolly had also, it is stated, exhibited these signals between Gros-nez and Sark, a distance of seventeen miles, with boards twelve feet square. The day-telegraph of the Rev. James Bremner, alluded to in a previous column, consists of a framework with two circular openings, in each of which a semicircular screen or shutter revolving upon an axis in the centre of the circle, is capable of assuming four different positions. This machine expresses an alphabet of sixteen letters, by dividing the letters into four classes or sets of four each, and making one shutter express the class, and a second, the number. In the third figure, Fig. 10, Charles Le Hardy communicated to the Society of Arts, in 1808, a telegraphic scheme of very different character to that which have been proposed. His Telegraph consists of a large framework with nine radiating bars, representing the numerals from 1 to 9, and four sets of other bars inscribing four concentric polygons (the whole apparatus having somewhat the appearance of a spider's web), which polygons express the numerals, tens, hundreds, and thousands, thus better shown by the innermost polygon. Attached to the centre of the machine by pivots are four slender arms, carrying as many square boards of sufficient size to be visible at a distance; the respective lengths of these arms being such that the board of one could not interfere by turning the arm, traverse the polygon which represents thousands, that of another the hundreds polygon, &c. The action of the apparatus is as follows:—If it be desired to express the number 9028, the shortest arm is placed in such a position that its bond may rest upon the radius 9, at the point where it is intersected by the thousands or innermost polygon; the next arm is turned to the radius 2, its board covering the point of intersection between it and the second, or hundreds polygon; the third arm and board is not called into action at all; and the fourth is turned, in the second, turned to the radius 2, the board covering the intersection between it and the outermost or units polygon. Thus the machine can express any number from 1 to 9028; but its power is increased by the addition of two other boards at the upper corners, one of which denotes 10,000, and the other 20,000, or, when displayed together, 30,000; so that the total range of the telegraph is from 1 to 10,999.

Several modes of telegraphic communication without machinery, or with nothing which cannot be conveniently carried by hand, have been devised, especially for the purpose of directing military operations, or of conveying speedy intelligence in time of war, where no line of ordinary telegraphs can be established. In 1808 such a plan, under the name of 'anthropo-telegraph,' was laid before the Society of Arts by Mr. Knight Spencer, whose communication was printed in the twenty-seventh volume of their 'Transactions.' Mr. Spencer had contrived, in the volunteer service, the inconvenience and loss of time occasioned in passing the orders of the commander-in-chief to the officers commanding distant divisions, when a great number of men were manœuvreured together, and this led him to devise the plan alluded to, which he put in practice for the first time in 1805. His apparatus consisted simply of two circular discs of wicker-work, about eighteen inches in diameter, with handles six inches long, painted white, with a black circle or ball in the centre. As these did not weigh more than about a pound each, a man could easily hold them, one in each hand, in any required position. Standing in the position of the first figure in the subjoined cut, Fig. 10, with both discs held down and turned edgewise to the observer, the telegrapher indicated 'attention'; in the second position, he expressed a desire to convey intelligence to the correspondent at a distance; turning

![Fig. 10.](image)
number lists must be readily expressible; and consequently it
might be applied to our numerical dictionary whatever.
Signs might also be made at night, by attaching reflector-
lamps to the discs, in such a manner that they might hang
vertically in every position of the discs, and strapping
another lamp, glazed with green glass, upon the breast of
the man ; and covering the whole. If interchanging letters
must also be lamps upon the back of the man and of the
discs. The difference of colour between the lamps upon
the body of the telegrapher and those attached to the discs
is essential to the distinct perception of certain
letters and numbers, and the difference between a 'letter'
and 'point' or 'period', in nocturnal telegraphing, depends solely upon
it. A letter from Admiral Hunter accompanies the description
; in which, after expressing a very favourable opinion of
the subjects recommended to enlarge the discs to twice
the diameter, and painting one side as above described, and
the other with a white centre and black rim, so that either
might be used, according to the state of the weather.

In the volume from which the above details are taken,
there is also an account of a yet simpler contrivance, inven-
ted by Lieutenant Spratt, for telegraphing by means of
a white handkerchief, held in various positions to express
the numeral characters and a few other convenient signs.
The invention employed this mode of communication
some time before the battle of Trafalgar, as a means of carrying
on conversation with a distant vessel ; and he had used it
successfully to converse between Spithead and the green
ramparts at Portsmouth, &c. With a common telescope it
might be use at a distance of more than a mile. Macclintock
describes some more complicated contrivances of similar
character, by the display of small flags, or of two white
handkerchiefs and a black hat ; by the latter of which plans
between fifty and sixty distinct signals may be made. He
also shows how signals may be made to any required extent
by men changing their positions from sitting to standing,
&c. Twelve men, arranged in three sets of four men each,
may in this way be used instead of his large shutter-tele-
graph.

Some of the earliest methods of telegraphic communica-
tion which have been noticed above were essentially
adapted for nocturnal use; but in modern times the use
of night-signals has not been extensively required, although
provision might have been made for their exhibition in con-
nection with many day-telegraphs. Thus, for instance, it was
proposed to add lamps to the moveable parts of Chappe's
telegraph; and Edelcrantz suggested the application of
lamps to his ten-shutter machine. In Davia's seven-shut-
ter telegraph, previously described as applied to day-ser-
vice, night-signals were to be given by a coloured lamp
mounted in the centre of the seventh or sliding shutter,
and six white lights attached to the outside of the frame,
to indicate the manner of their display or the particular
signals; as, under ordinary circumstances, are given by
the opening and closing of the shutters. These side-
lamps were to be secured to upright pieces of wood, alid-
ing the form of dovetailed grooves in the outside of the
frame-work, so that they might be readily withdrawn
when not in use. Provision is made for the adaptation of
Paley's universal telegraph to nocturnal communication
by adding a central light at the top of the post, a lamp to the
extremity of each arm in additional light as an indicator, suspended from a light derrick or crane project-
ing horizontally beyond the range of the arms, and on a
level with the top of the post. This, the lamps themselves, and the four national counterweights required with which
they should all be removed during the day. How little neces-
sity there is, under ordinary circumstances, for the use of
telegraphs by night, at any rate in connection with the
navy, may be assumed from the statement of Sir John
Barrow, that no attempt was ever made to add lamps to the
six-shutter telegraphs formerly used by the Admiralty,
notwithstanding the ease with which it might have been done.
The semaphore now used by the Admiralty are also con-
structed without any provision for the display of
night-signals. Macdonald's treatise ['1817, p. 218]
contains schemes for night-telegraphs, both for land and sea; one
of which, consisting of three sets of four lights each, with an
additional or director light to each set, has the same effect
as his favourite lamp.

Marine telegraphic communication is an object of even
greater importance than that which has been principally
treated of in this article, since there are many circum-
stances which render personal communication between
vessels at sea impracticable, and therefore the greatest
emergency. But, although naval arms
and of be extensively employed for the pur-
pose of making them, it was not until within a couple
of years that the: idea of employing a perfect telegraphic
system. Sir John Fars
states [Ency Brit., art. 'Navy'; that the idea of
-pering the flags, and of assigning a certain number of
characters or letters to the senders of the signals, and the
numbers, was reduced to something approaching a real
system in the fleet of Lord Howe; and that in the
1796 a new signal-book was issued by the Admir-
ity, which contains the following system of flags and
numerals, to be used in the fleet. The letters 'A' and 'B'
also printed, at Calcutta, a new code of naval signals, which
was subsequently reprinted in England, greatly exten-
sed and adopted for use in the navy. Among the numer-
um improvements introduced by him is a new method of
the letters and numbers, which were issued by the Board of
Arts in 1816, 'the salvages of the bunting are
on the outer edges of the flags, and the goring or
centre, by which means the outer edge is useless and
the going assist in keeping it out; whereas the old flag,
a hem on the outside, which rendered them difficult
moved without a fresh breeze, especially in damp or
rainy weather, as the hem then became very
bent. It was also added, 'it is impossible to
buntings, to sew a straight seam, for the instant it
will become in some degree curved.' (Transactions, xxi., p. 174.)

The only objection urged by him to the code of naval signals now in use is one which
is applicable, more or less, to all that have been subsequently
proposed, namely, the great number of flags, &c., required
for making numerical signals to the extent had ever
in the code in question, amount to nine flags, six
cornettes, five triangles, and five pendents. With this
number, he states, it is next to impossible, in calm
weather, to make out the figure and colour of the flags; and
even when, though supplied with the wind, the observer
is able to present only an eye and a separate glance at
the particular figure, it is hard to believe that the
observer, without the aid of a key, can distinguish the
figures, and that so the basely prepared table of
the navy and the similar one of the admiralty
be applied in like way with advantage.

The principles in the numerical system as applied
flag-telegraphs in the navy is briefly explained by
Mc
ndon. Nine different variegated flags are employed
to express the numerals 1 to 9, another for 0, and
was called a substitute, to repeat any flag under which
it was repeated, in case of the number numeral occurring
to be in the number to be expressed. A pendant is also
used in some cases as a substitute for the uppermost figure
thus, by the use of eleven different flags and a pendent
number from 1 to 999 may be represented
by a complete set of flags which are all displayed in the
same flag, and a pendant at once. In a telegraphic system devised by Mr. in
and fully explained in the 'Transactions' of the Society of Arts for 1817 (vol. xxv., pp. 235-239), flags are used to
express numbers, but not in the same flag, and the
basis of the system is the alphabetical list of the
necessary English words, arranged in a tabular form
the common multiplication tables, columns and horizontal lines being numbered.

The number of squares or divisions is 8901. The number of words is
in this system ever greater, because in some cases, where no number
is likely to be occasioned by it, the redundant word
is placed in a set of square or division of the table. The entire system consists of twelve
flags (ten for the numerals and 0, a substitute, and a
parallel signal), the same number of triangular flags

T E L 132  T E L
tintness of the semaphore at all times, and especially in cloudy weather. In order fully to decide the question, the shutter-telegraph at Nunhead, near New Cross, was left standing for some time on the same hill as the new semaphore; and the result of the trial for a whole winter was, 'that the semaphore was frequently distinctly visible when the boarded telegraph was so concealed in mist and fog that the particular boards shut or thrown open could not be distinguished; and that the number of days in the course of the winter upon which the sema-
phore was visible was equal to the number of days when it could be seen by the same telegraph at the same distance. Between the two shutters of the telegraph there were lamps, so that from the former the semaphore could be seen by one-third. Even in the six-shutter telegraph one shutter was occasionally mistaken for an-}
other, and such accidents would doubtless have been more common had a more complicated shutter-telegraph, like Barrow's, been employed. Admitting, however, that the semaphore was more distinctly visible against the semaphore on the ground of the longer time taken to move the arms, because they describe arcs of larger circles than the boards of a shutter-telegraph, is amply compensated by the greater facility of reading off. The semaphore has also the advantage in the greater sim-
plicity of its machinery, which is much less liable to get out of order than the telegraph. As shown by the tables given in the previous descrip-
tions of the three machines particularly noticed by Barrow, the shutter-telegraph has the power of making a greater number of combinations without the use of the stop-signal (for one word or combination employed) than either of the others, and Paxley's universal telegraph has the least power; but this is of little con-
sequence, if the lowest power prove sufficient. Although the primary signals of the semaphore of Poppam's telegraphic dictionary, which do not exceed 13,000. As this dictionary has never, it is affirmed, been found materially deficient in any of its divisions of subjects, it is evident that even when applied to communication by words and sentences instead of by letters, Paxley's simple telegraph affords sufficient power for all useful purposes; and further, that those who have extended their telegraphic dictionaries to very high numbers (Paxley mentions one extensive to 140,000), have impaired their usefulness, owing to the difficulty of finding the required sentence among so many. 'We have actually seen in one telegraphic dictionary,' observes Sir John Barrow, '120 pages, of three columns in each page, and sixty sentences in each column, containing over 20,000 sentences (about one-third of the number of words in Johnson's dictionary), and each of these senti-
ences beginning with the personal pronoun ''He'.' 20 pages with 'It,' &c. Compared with the use of such a dictionary, he proceeds to say, 'spelling the sentences is infinitely preferable as to certainty, and in many cases as to celerity. Indeed we should say that the abbreviated nature of communications made by telegraphs renders spelling by far the most expeditious. In clear weather the rapidity of working single signals, the short compass within which any message may be condensed, the impos-
sibility of committing any mistake that cannot be imme-
diately rectified, more than compensate for the difference in the use of sentences. 

In cloudy or foggy weather, the latter method will always be liable to mistake. If experience may be as-
sumed as a guide, the practice at the Admiralty of spell-
ing all sentences, and the thirty years, may decide in fa-
favour of that system. ' In making electric telegraphs, her-
metically, much time may be saved by omitting non-
essential words and letters, especially vowels. For example, the meaning of the sentence ' Order the Agamenon out of harbour, and direct the message to be so expressed by ' Agamenn. to Sphed.' It is also im-
portant to condense the substance of the communica-
tion as much as possible into the former part of the 
message, so that no serious mistake may arise if the com-
}
the non-observance of this principle: a despatch from Plymouth to convey intelligence of a British victory having been commenced by the words 'Wellington defeated,' and then broken off by fog, which prevented the whole meaning, 'Wellington defeated the French at &c.' from being transmitted. Had the message run thus, 'French defeated at, &c.,' the interruption of the despatch would have been of far less consequence.

Any means of telegraphic communication which depends upon the carelessness of such an inhibition at a distant station is necessarily dependent upon contingencies of weather; but many plans have been contrived for effecting the object in such a manner as to be independent both of light and of the state of the atmosphere. For commercial purposes the different letters or numbers of a household object may be effected by a mechanical connection, by chains or wires, between two dials with revolving indexes or pointers, in such a way that when one pointer is directed to a particular letter or word inscribed upon the dial to which it is attached, the other may exhibit a similar movement. The attention of the servant is engaged previously by ringing a bell; and when the required signal has been made, a spring returns both indexes to their original position. Such a plan, that very useful for domestic purposes, is not adapted for distant communication. Speaking-pipes, or tubes to convey the voice from one place to another, are also available for short distances, but the cost limited for communication on an extended scale. One of the early schemes of this character depends upon the principle of water always finding its level; but, independent of the difficulty which might arise from the friction of water in a very long pipe of small diameter, such as would be required to connect the vertical tubes in which the observations would be made, such a plan involves the necessity of having all the communicating stations at or near the same level. Other hydraulic telegraphs depend upon the incompressibility of water or other liquids; it being proposed to lay down small pipes of any required length, and to indicate different signals by pressing more or less upon the surface of the fluid contained in them, which would, it is supposed, transmit the motion to the opposite end of the pipe, where it might be pointed out upon a dial, or in any other convenient manner. Mr. Vallance described such a method of telegraphic communication in a pamphlet, published in 1825, of which Heribert gives some account (Engineer's and Mechanic's Encyclopedia, vol. ii., pp. 747-81); and some similar schemes have been more recently proposed. Air confined in small pipes has also been tried to a limited extent as a pneumatic telegraph; but in this, as well as in the hydraulic system, the risk of leakage is a serious disadvantage. The application of electricity to telegraphic communication is attended with fewer difficulties, and has recently been carried into effect on an important scale by Messrs. Wheatstone and Cooke. The possibility of so applying it was suggested by several persons long before it was attempted on a practical scale. Arthur Young, who visited France in 1797, 1788, and 1789, mentions, in his travels, the experiments of M. Lomond, who was able by means of electricity to convey messages from one room to another; and the Rev. Mr. Gamble, in his description of his original shutter-telegraph, alludes to the project of electrical communication. Mr. Francis Ronalds, in a pamphlet on this subject, published in 1823, states that Cavallaro proposed to convey intelligence by passing given numbers of sparks through an insulated wire; and that, in 1816, he had himself tried experiments upon this principle, which he deemed more promising than the application of galvanic or voltaic electricity, which had been projected by some Germans and Americans. He succeeded perfectly in transmitting signals through a length of eight miles of insulated wire, and he describes minutely the contrivances necessary for adapting the principle to telegraphic communication.

It is related to the laudable labour of Messrs. W. F. Cooke and Professor Wheatstone that electric telegraphs over their practical application; and in a statement of the facts respecting their relative positions in connection with the invention at their respective stations by Sir M. F. Bennett and Professor Danell, it is observed that 'Mr. Cooke is entitled to stand alone, as the gentleman to whom this country is indebted for having practically introduced and carried out the electric telegraph as a useful undertaking, promising to be a work of national importance; and Professor Wheatstone is acknowledged as the scion of whose profound and successful researches had already prepared the public to receive it as a project capable of practical application.' Their telegraph, which was patented in 1837, acts upon principles founded on Oersted's celebrated discovery, that a magnetic or compass needle not through the agency of a voltaic current, be invested with an artificial polarity. [Electro-Magnetism, vol. ii., p. 242.] 'Thus,' explains Mr. Cooke (Telegraphic Railways, p. 14), 'as a natural stream of electricity passing round the circumference of the earth causes magnetic needles in general to be deflected at right angles to its course, or towards the north and south poles, so an artificial stream of electricity of adequate strength will cause magnetic needles placed within its influence to be similarly deflected at right angles to its course, whatever the may be. If then a magnetic needle were placed near to any part of a conducting wire, which was supposed to be laid down between London and Edinburgh, the transmission of an electric current from a voltaic battery would cause the needle to change its position, so as to stand during the continuance of the current at right angles to the wire, being turned in one direction or other according to the course of the current. If this deflexion of the needle were limited by two fixed magnets placed respectively at the two sides of one of its poles, the motion of that pole to one stop might evidently convert one signal into another, and the second wire would pass into the third; which would complete the circuit between the poles of the second magnet, and carry the current through the opposite wire, which would be converted into a new signal, the second being deflected at right angles to the second wire. Such an apparatus is shown in Fig. 11, the dial upon which the signals are represented being removed. In this case

may be supposed to represent the battery, and b the conducting wire, which is formed behind the dial into a circle; d is the magnet, which is carried passing through the coil, and carrying upon its extremity, which comes through the dial, an index or pointer, e, of arrows indicate the direction of the current required to effect the magnet to the position indicated by the direction of the opposite direction would produce deflexion towards the opposite side. While current passes through the wire, the magnet and pointer remain vertical. The next cut (Fig. 12) represents three such instruments complete, and connected together by wires closed in tubes, which may be of any required length. One of these may be supposed to be at the Minories, next at an intermediate station, and the third at Blackwall; and as each is provided with a battery, a magnet of the same magnitude and current, which is mounted upon an arm, and engaged by ringing a bell, placed above the dial, by an ingenious application of the voltaic current. By this beautiful simple apparatus the peculiar method of working the trains upon the Blackwall railway (Nan wounded, and

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The telegraph wires, as they are sometimes called, are made of a finer and stronger material than the ordinary wires used in telegraphy. They are constructed of a number of fine, closely woven threads, and are usually insulated with a thin layer of rubber. The insulation serves to prevent the wires from short-circuiting, and also to protect them from the effects of weather and other external influences.

Fig. 13.

Telemachus, the son of Odysseus (Ulysses) and Penelope. When his father joined the Greeks in their expedition against Troy, Telemachus was only a child, but during his father's absence he grew up to manhood. When the expedition was at an end, Telemachus should return home from the island of Ogygia, Athens (Minerva), assuming the appearance of Mentor, king of the Taphians, appeared to Telemachus, and advised him to get rid of the suitors, who, if Penelope should wish to marry again, to send her to her father's house, that she might celebrate her nuptials there. She also advised him to sail to Pylos and Sparta, to see whether he could learn anything concerning his father, who, as she said, was probably still living in some island where he was forcibly detained; but if he should be freed, she enjoined Telemachus to raise a monument to his memory, and to make himself the suitor of his mother either by stratagem or by force. Telemachus obeyed the commands of the goddess, and visited Nestor at Pylos and Menealus at Sparta. Both of them received him hospitably, and Menelaus communicated to him the prophecy of Proteus concerning his return. In the meantime Telemachus arrived at Ithaca, and lodged with Eumaeus, the second son, and the disguise of a beggar. In this condition he was found by Telemachus, who, by the advice of Athena, had also returned to Ithaca. The father made himself known to his son, and the two devised a plan for getting rid of the suitors. They went to the town, and Odysseus was admitted as a beggar to a feast of Telemachus and the suitors. When the suitors began to insult the poor man, a fight ensued, in which Odysseus and Telemachus killed all the suitors. Telemachus accompanied Odysseus in the aged Laertius. Thus far the story is described in the Odyssey. Later writers mention other incidents connected with the story of Telemachus, especially relating to his marriage, which is mentioned in the account. According to one tradition, he married Circe or her daughter Cassiphone, and he had a daughter Roma, whom he gave in marriage to Aeneas. Servius (ad Aeneid, x. 167) calls him the founder of the town of Clusium in Etruria.

In modern times the name of Telemachus has acquired celebrity from the moral romance of Fénélon, which is based upon the story in the Odyssey. [FENKLON.]

TELEMANN, GEORG PHILIPP, a name of no mean rank in musical history, therefore entitled to some notice here, was son of the Lancoriner of the Lutheran church at Magdeburg, and there had his birth, in 1681. Though educated with other views, his predilection for music was too strong to be combated, and it became his profession. He successively lived with a number of the principal composers of his time, and at last flourished in the chief of which was that of composer to the Lyric theatre at Hamburg, for which he produced no less than thirty-five operas. But these were only a small part of his labours: he is said to have exceeded the prolific Alessandro Scarlatti in the number of his works for the church and the chamber; and, in 1740, his overtures on the model of Lulli amounted, Doctor Burney tells us, to six hundred! Strange however as it may appear, yet it is most true that of this almost incredible number of compositions, only two are figured in his works, one at least in England, and these only to a very few organists of patient and deep research.

Telemann was a fellow student of Handel, and attained considerable longevity, having died in 1746, at the age of 80. He was twice married, and each time had ten children; and it is remarkable that not one of them manifested the slightest inclination for the art to which their father owed his fortune and reputation.

The TELESAURUS, or Crocodilus, or Stenoseauri, was written by Professor Owen, who has published his valuable Report on British Fossil Reptiles, in which he notices, among others, a family of extinct crocodilians characterized by a combination of a bi-concave structure of the vertebral column and long, narrow, pointed, and equal teeth, adapted, like those of the existing Gavials, for the seizure and destruction of fishes. Professor Owen makes this family consist of two genera, whose characters mainly rest on the difference of position in the external nostril. In the first of these, Teleosaurs, the external nostril is terminal and placed at the extremity of the upper jaw; in the other, Stenoseauri, this aperture is a little behind and above the termination of the upper jaw.

Geographical Distribution and Habits of the Family.—The Teleosaurs and Stenoseauri are confined to the continental division of the secondary rocks. At this period there were scarcely any mammals, but fishes were abundant, and Professor Owen notes that the Jurassic rocks of Dr. Buckland in his Bridgewater Treatise, that it might, a priori, have been expected that if any crocodilian forms had then existed, they would most nearly have resembled the modern Gavial. Professor Owen has planned for numerous modifications in the structure of the vertebral column, and the complete mail of imbricated bony scutes, characteristic of the species, indicate that the habits of the ancient Teleosaurs and Stenoseauri were more strictly marine than those of the modern Gavial, adapted for swimming, of pursuing and overtaking their aquatic prey, were greater.

After noticing the papers of Mesmer, Woolner and Chapman, in two separate communications in Phil. Trans., vol. 60, 1780, and the figures of an incomplete skeleton...
there given, as one of the earliest evidences of ancient reptiles recorded in a scientific publication, and observing that, notwithstanding the remark of Captain Chapman, that 'it seems to have been an alligator,' and of Mr. Wooler, that it 'resembles in every respect the Gangetic Gavial,' Camper pronounced it to be a whale, meaning perhaps a dolphin; an opinion, however, Mr. Wooler went a step further, and referred it to the genus *Physotherium*.

Professor Owen points out Cuvier's refutation of Faujas in the first edition of the *Ossements Fossiles*, and his declaration in the same work that it was in truth a crocodile. The Professor adds, that Cuvier's subsequent analysis led him (in 1812) to the conclusion that it belonged to the genus of Crocodiles, and was most probably identical in species with the crocodile of Honfleur.

Mr. Wooler's and Chapman's opinion of Mr. Wooler and Chapman came much nearer to the truth than those of Camper and Faujas, they were still distant from it; and Professor Owen proceeds to show that the fossil really differs more from the Gavial than the Gavial does from any other existing Crocodilian.

Pursuing his inquiry, Professor Owen remarks, that in 1836, when so many new and singular genera, allied to the Crocodilian family, had been added to the catalogues of palontology, by the labours of English and European geologists; naturally, Cuvier expressed his opinion with more caution. Cuvier then says, 'It now remains to be known whether it is a crocodile, or one of those new genera discovered in the same beds. The bones of the external part, however, imperfect as they are, presented with sufficient details, to decide the question; but the vertebrae appear to me to be longer, in relation to their diameter, than in the new genera, and, in this character, more like those of Crocodiles. Those alone who shall rediscove the original, if it exists, will be able to inform us whether the other characters respond to those referred to.'

Professor Owen inquired at the British Museum, to know whether formerly belonging to the Zoological Society of London were transferred, but he states that no specimen corresponding with the account and figures given by Messrs. Wooler and Chapman exists in that museum.

But a second specimen of a Crocodilian with a long and slender nose was procured from the lakes near Whitby (between Staitha and Runswick) in 1791, and a more perfect skeleton was obtained from the alum-shale of Saltwick, near Whitby, in 1834. Professor Owen has figured these specimens as closely resembling the older fossil in all the points in which a comparison can be established, as to dissipate the remaining doubts as to the nature and affinities of the specimen from the same locality by Professor Owen. He then refers to the figures of the skeleton discovered in 1834, in Young and Bird's Geological Survey of the Yorkshire Coast, and in Mr. Buckland's *Bridgewater Treatise* [Crocodile, vol. viii., p. 109, observing that it is now preserved in the museum at Whitby, where he closely examined it.] In this specimen,' says the Professor, 'are preserved the cranium, wanting the snout, the whole vertebral column, the ribs, and the principal parts of the four extremities, together with the dorsal and part of the ventral series of dermal bones. The entire length of the skeleton, following the curvature of the spine, is thirty feet five inches, to which may be added two feet six inches for the lost snout. The cranium posteriorly is broad, depressed, and somewhat elbowed in front, the occipital bone, as is the case in the crocodile, is elongated in the focal, and occupies four-fifths of the temporal fossæ; the anterior part of this fossa being narrow and acute. The cranium, or ocipital of the ear, is vertical, and much larger in proportion than in any existing crocodile or other reptile.'

'Cuvier calculates the number of teeth in the *Ctenosaurus Cadomensis* to be 180, viz. 45 + 45; the *Teleosaurus Champomii* has at least 140 teeth. The Gavial, 29-25. The teeth of the Whitby Teleosaur are slender and sharp-pointed, but not so compressed as the Gavial; they correspond with those of the Ctenosaurus, and equally illustrate the dental characters usually attributed to the present extinct genus.'

Professor Owen then shows that the Whitby Teleosaur differs from the Ctenosaurus as does the Monheim Teleosaur (*Crocodylus pisciosus, Soemmering*), having in the upper temporal fossæ a longer in proportion to their breadth and that it also differs from the Teleosaur of both the Monheim and Monheim in the more equal size of the teeth from that of Monheim in the greater number of teeth.'

The *Teleosaurus pisciosus* having at most 27-27 20-10. But points out other differences.

In treating of the vertebral column, the author says that the number of vertebrae in the crocodile of present period rarely exceeds sixty, the number as by Elchan to the crocodile of the Nile. Cuvier, observes, generally found 7 cervical, 12 dorsal, 5 lumbar, 2 sacral, and 34 caudal vertebrae. In the *Crocodylus pisciosus* the number and proportions of ribs is occasionally developed, and, according to Plinius, the last mentioned species has two additional caudal vertebrae; the *Alligator lucius* [Crocodile, vol. viii., p. 103] has the additional ones being in the caudal region. Gavial has 67 vertebrae, viz. 7 cervical, 13 dorsal, 13 lumbar, 2 sacral, and 41 caudal.

'The very perfect specimen in the Whitby Museum says Professor Owen, 'displays the number of three thousand, and is much larger and more perfect than any other. Another difference between the Teleosaur and the Gavial is, the former having a number of vertebrae intermediate between the Crocodiles and Gavials, viz. 64, with a peculiarity in the excess of costal vertebrae, as the number of posterior vertebrae is greater than the number of ribs. The vertebrae of the atlas and two sacral vertebrae of the Gavial had the opportunity of seeing only the annular (neuropophyses) of the cervical vertebrae of the Ctenosaurus.
Teleosaurus, regrets his inability to state whether either of the articular extremities of the centrum were convex, or which of them. The Whithby Teleosaurus decides this question, and shows that both articular extremities of the vertebrae are slightly concave in the cervical as in the rest of the vertebral series. The atlas in the Teleosaurus corresponds essentially with that of the crocodiles, as is shown by the three main component parts of this bone, from a Whithby Teleosaurus in Lord Emmi Ultris's collection. The body or centrum is a transverse quadrilateral piece, smooth and contains an investment of an inflated wedge above, with articular facets, viz.: a concavity in front for the occipital condyle; a flat rougher surface on each side of the upper part for the attachment of the neuropophyses of the atlas; on the anterior part of the detached odontoid element of the axis; and a small circular face on each lateral posterior and inferior angle, for the alatal ribs. The neuropophyses are pyramidal processes, with their spines curved towards each other; they are relatively small in proportion to the centrum than in the crocodile. The general anterior concavity for the reception of the occipital tuberle is formed at its circumference by the centrum and neuropophyses of the atlas, and at its middle by the anterior detached odontoid epiphysis. The axis is a long piece, in every part of the so-called atlas in the Ichthyosaurus, the true body of the atlas in the Teleosaurus representing the first inserted wedge-shaped bone in the Ichthyosaurus. The spine of the atlas is a large oblong piece articulated with the neuropophyses of the atlas, and partly overlapping those of the axis.

The Professor then describes in detail the cervical vertebrae, from which it appears that the same mechanism for fixing and strengthening the neck, as is found in existing species, exists in the ancient marine crocodiles; the vertebrae of the dorsal region, with 16 pairs of ribs, a greater number than occurs in any existing Crocodilian; a posterior dorsal or lumbar vertebra, which faintly indicates one of the many known elements of the vertebrae of Sauria; and the caudal vertebra, which progressively diminish in every diameter, save length, from the middle to near the end of the tail, the terminal vertebra being shorter than the rest. The sternum and interclavicle, the sternal parts, closely agree with an ordinary Crocodilian type. He had not seen a specimen of the abdominal sternum ribs.

Professor Owen then notices the structure of the Pectoral and Pelvic Extremities, as compared with those of existing Crocodiles, and the Dermal armour, the bony dermal scutes of which are regularly disposed in the Teleosaurus, as in them; but the scutes of Teleosaurus Chapmanni, he observes, differ as much from those of the existing Crocodiles and Crocodiles, as those of Teleosaurus Cadomensis do. The following are the species recorded by the Professor:—Teleosaurus Chapmanni; Teleosaurus Cadomensis; Teleosaurus Cadomensis, var; and Teleosaurus Henodierus, Owen. [STENOSAURUS; CROCODILE, vol. viii., p. 168.]

TELESCOPE (from the Greek telescopos, translated, 'far-seeing'), an optical instrument consisting of a tube which contains a system of glass lenses having all their centres in one common axis, or a tube containing a metallic speculum in combination with such lenses: by either kind of instrument distant objects are caused to appear magnified, and more distinct than when viewed by the naked eye. Those which are constructed with glass lenses are called catoptric, or reflecting telescopes. In the former kind the rays in the pencils of light which come from every part of the object viewed are, by the first lens on which they are incident, made to converge so as to form an image at the focus of the lens; the pencils of rays on the second lens being intercepted by a second lens, and, by its refractive power, are made to enter the eye in parallel directions: in other cases, the rays, after having crossed each other in the first lens, the image being formed, fall in a divergent state upon a second lens, and by it are refracted so as to emerge from it in parallel directions. Frequently however the parallelism of the rays is effected by two or more lenses in addition to that, called the object-glass, by which the image of the object is formed, fall in a divergent state upon a second lens, and by it are refracted so as to emerge from it in parallel directions. Frequently however the parallelism of the rays is effected by two or more lenses in addition to that, called the object-glass, by which the image of the object is formed, fall in a divergent state upon a second lens, and by it are refracted so as to emerge from it in parallel directions.

In exhibiting the principles on which a telescope is constructed, it will be proper to commence with an explanation of the means by which the image of an object is formed at the focus of a lens or of a reflecting mirror. With respect to a lens, if it be of the kind called convex [Leys], the rays in the pencils of light which proceed from every part of the object as if passing through the lens, suppose the latter to have a proper degree of curvature, are made to converge by the refracting power of the glass at points, as a, b, and b, and the assemblage of such points constitutes an image of the object; if a screen were placed at F perpendicularly to the axis PF, the object would be represented on it, in an inverted position.

If the lens were of a concave form, the rays in the several pencils, after passing through it, would be made to diverge from one another, and consequently no image could be formed: yet if the directions of the rays, after refraction, were produced backwards, they would unite between the lens and the object, in points corresponding to those which constitute the image formed by the convex lens.

If the rays in the pencils of light proceeding from different points, A, P, B, in an object are reflected from the surface of a concave mirror, suppose the latter to have a certain degree of curvature, those rays will unite in as many points, a, F, and B, and form an image of the object. If a screen were placed at F the object would be represented on it, in an inverted position. The rays in each pencil reflected from the surface of a convex mirror are made to diverge from each other; and in that case no image is called formed. Now, if the object AB be so remote that, in each pencil, the rays incident upon a lens may be considered as parallel to one another, the point F is called the principal focus; and it is evident from the article Leys (p. 421, col. 2) there will be found a collection of some cases for the reciprocals of the focal lengths of lenses of all the different kinds; it being understood that the diameter of the lens is small, which is generally the case with telescopes, and that the light is homogeneous. But, since all light is not of one kind, a lens acts like a prism in causing, in each pencil, the rays of the differently coloured light to diverge from one another: it follows that each of the coloured lights will form its own image at its proper focus; and the image formed by light of one kind being seen by the eye along with the images formed by light of the other kinds, the representation of an object when formed by a single lens
appears to be indistinct and surrounded by a coloured fringe. (ACHROMATIC; DISPERSION.) It may be observed that the principal focus of any lens, with respect to each colour, may be obtained from the formula in OBJEKTION in the volume of Ρ (the index of refraction) for the given kind of light.

Thus, in an optical instrument, in addition to the distortion of the image arising from the sphericity of the lens, there is an indistinctness caused by the dispersion of the different colour-making rays; and, in a good telescope, it is requisite that both of these imperfections should as far as possible be removed. The chromatic aberration, as the dispersion of the colour is called, constitutes, by far the greatest evil of the two, for Newton has shown that it exceeds the former nearly in the ratio of 5419 to 1; but fortunately it is that which, to an extent sufficient for practical purposes, admits of being easily corrected.

Since different kinds of glasses have different degrees of dispersive power, it is evident that the chromatic aberration may be diminished, if not wholly removed, by causing the light to pass through two lenses of different kinds of glass, and of such forms that they may refract the rays in each pencil in opposite directions. The object-glass of a telescope when so formed is said to be achromatic and the manner in which the effect is produced may be understood from the following description. Let PQ be the direction of a pencil of compound light incident on the first surface of the convex lens AB, in a direction parallel to the common axis, XY, of the two lenses. By the refractive power of this lens (crown glass) the red rays in the pencil would, if no object were interposed, proceed in the direction QA, meeting XY in r, and the violet ray in the pencil would proceed in the direction QC, meeting the axis in v. But the refractive power of the concave lens CD (flint glass) acts, from its form, in a direction contrary to that of the convex lens, causing the rays either to diverge from the axis XY, or to meet it in points beyond r and v, towards Y: suppose the curvature of this lens to be such that the red rays in the pencil PQ would, after refraction in both lenses, meet the axis in F (the ray QR taking the direction DF); then the dispersive power of this kind of glass exceeding that of the other kind, the violet rays in the refracted pencil will tend farther away from the axis than the red rays do, and thus will tend towards the latter; the ray Qr, for example, the direction of the object-glass is receivable, therefore, that the curvatures of the surfaces of the lenses may be such that in each incident pencil, the red and violet rays (the extreme rays of the spectrum) shall after refraction unite at the place of the image; and thus the fringe due to these two colours may be destroyed.

If the two kinds of glass dispersed the different colour-making rays in the same proportions, their contrary refractions would cause all the colours to be united on the image formed at F: no two kinds of glass have been as yet discovered which possess this property; and therefore the red and violet images only are united: fortunately in uniting the extreme rays of the spectrum, the others are brought so near together, that for ordinary purposes the image is as free from colour as can be desired.

From the above description it will be evident that the place F, of an image in which the dispersion of the red and violet rays is corrected, may be determined on the following common theories of optics, algebraic expressions, the focal lengths of the compound lens for each of those kinds of light, and making the expressions equal to one another. Thus, supposing R and S to be the radii of the curve surfaces of a double convex lens of crown glass, and μ the index of refraction for light of one kind (red, for example); it is known that the rays in the pencils of incident light are parallel to one another and pass through the lens very near the axis: then, by a fundamental theorem in optics we have, F being the distance from the focus to the lens, which is moreover without thickness,

$$F = \frac{R S}{R + S;} \mu = 1;$$

but since, in the present case, the lens may be supposed to be isosceles (R=5), we have

$$F = \frac{R}{R};$$

In like manner the focal length F', of a double concave lens of flint glass, R' being the radius of each such and μ', the index of refraction for red rays, is equal

$$F' = \frac{R' \mu'}{R' \mu' - 1};$$

the rays being incident near the axis.

Hence, by a fundamental theorem in optics,

$$\frac{R'}{R'} + \frac{R'}{R'} = \frac{R}{R} + \frac{R}{R};$$

and this last term is the focal length of the compound lens for red rays. Its reciprocal is equal to

$$\frac{2}{R} - \frac{2}{R} R';$$

which, in the algebraic sense, is the sum of the reciprocals of the focal lengths of the separate lenses.

On writing μ + μ' and μ'-μ' in place of μ and μ', the last expression, we have for the reciprocal of the focal length of the compound lens for violet rays,

$$\frac{2}{R} \mu - \mu' \cdot \mu' \cdot \mu';$$

in an achromatic telescope the focal length of the compound lens for red and violet rays are to be equal to one another; and it is evident that this condition will be fulfilled when μ' = μ. From this equation we have

$$R : R' : \frac{R'}{R'} = \frac{R'}{R'};$$

dividing the antecedents by μ, and the consequents by μ'-1, we have [DISPERSION] the ratio of the focal lengths of the two lenses equal to the dispersive powers of the two kinds of glass; and hence the focal length of the compound lens being assumed, the pleasure, those of the separate lenses consequently to radii of their surfaces, may be obtained.

In order to diminish the spherical aberration, the object glasses of achromatic telescopes frequently consist of two lenses, of which the first and third are of the kind called double convex, and are formed of crown glass, while the second is double concave, and made of flint glass. In this case, since the index of refraction is the same for the two lenses for the first, if the radius of each surface of the flint lens be R, the reciprocal of the principal focal length of the separate lenses for red rays will be

$$\frac{2}{R} \mu - \mu' \cdot \mu' \cdot \mu';$$

these being added together, their sum will be the reciprocal of the focal length of the compound lens for red of kind of light. On substituting in the above terms for μ, μ', μ'+μ' in order to obtain the reciprocal of the focal length for violet rays, we shall have, with chromatic aberration being corrected,

$$\frac{R}{R'} = \frac{R}{R'};$$

But $\mu' = \mu$ is known from tables of the refractive indices for different kinds of glass: therefore if any convenient relation between the radii of two of the lenses be assumed, the values of all the radii, and consequently the focal lengths of the several lenses, may be found.

The investigation of formulas for the correction of the spherical aberration is a process of some labour, and a scarcely a fit subject except for a mathematical work, as is treated with great perspicuity in Robison's 'Mechanical Philosophy,' vol. III, from which the subject of the present theorem is borrowed, the notation only being changed as that which has been adopted above; and also in the articles LENS and SCULPTURE. If a compound object-glass consists of one or two double convex lenses of crown glass and a double concave lens of flint glass, the ray might be incident upon the anterior surface of the former in a direction parallel to the axis, at a distance from those, when
is expressed by $e$; the distance from the lens, of the point at which the ray after refraction will meet the axis, is $r + y$ (or $r'$), where $r$ is the focus for parallel rays infinitely near the axis, and may be found as above, and $r + y$ is the aberration. Here, neglecting the thickness of the lenses and the interval between them,

$$ q = \frac{\mu - 1}{\mu} \left( \frac{\mu^2 - 2\mu + \mu^2 + 2\mu + 2}{n''^2 - n''^2} + \frac{A + 2\mu^2}{n''^2} + \frac{4(\mu' + 1)}{F', R''n''} \right) \cdot n = \frac{RS}{R + S};$$

where $F$ is the principal focus of the convex lens, and $u' = \frac{-R'S'}{R' + S'}$ ($R'$ and $S'$ being the radii of the surfaces of the concave lens.)

It is evident that, in order to correct the spherical aberration, the values of the radii of the surfaces must be determined from the equation $q + q' = 0$. This equation is however indeterminate, because it contains several unknown quantities; but it may be made subject to certain conditions by which there will remain only one for example, the different radii of the lenses may be made to have any given relation to one another, so that the values of all, in terms of any one, may be substituted for them. In the values of $q$ and $q'$ the terms represented by $a$ and $n''$ are respectively equal to half the radii of equivalent isosceles lenses; and it has been shown, in the investigation concerning the chromatic aberration, that these are to one another as $\delta a$ to $\delta n''$; consequently $n'' = \frac{\delta a}{\delta n''}$ and therefore $a''$ is known in terms of $n$. If again it is supposed that $R'' = S''$, or that the nearest surfaces of the convex and concave lenses have equal curvatures, the value of $R$ may be found from the equation $q + q' = 0$, in terms of $n$, by a quadratic equation.

Sir John Herschel, in a paper on the determination of the aberration of compound lenses and object-glasses (Phil. Trans., 1821), has also introduced a formula for the values of the chromatic and spherical aberrations; and M. Littrow, of Vienna, setting out with Euler's formula for spherical aberration ($Dissertatio, tom. iii., 1769$), and introducing in it the values of the focal lengths of two lenses so that the former aberration may be corrected, has obtained two equations from which the radii of the four surfaces may be determined by such conditions as may be thought convenient. (Memoirs of the Astron. Soc., vol. iii., part 2.) In solving the problem relating to the determination of the four radii, Professor Littrow uses a method which possesses facilities for computation, and on that account it has been adopted in the following process.

The radii of the surfaces of the first lens may be determined on the supposition that the whole refraction of light in passing through the lens is a minimum; that is, that the incident and emergent rays make equal angles with the surfaces, or with those radii. Thus the ray $PQ$ be incident on the first surface in a direction parallel to the axis $XY$ of the lens, and infinitely near it; and $RQT$ being the radius ($= R$) produced, of that surface let the angle $PQT$ of incidence be represented by $a$; then $\mu : 1 = \frac{a}{a'}$ ($= RQF$, the angle of refraction at that surface). But if $RQT$ be the radius ($= S$) produced, of the second surface; then, in the triangle $RQK$, neglecting the thickness of the lens and substituting areas for their sines, $S = \frac{R}{a}; S = a + u. a_{\mu}$ ($= TQF$) is the angle of incidence on the second surface, and, by optics, $1$ is to $a_{\mu}$ as this last angle is to $\frac{a_{\mu} R}{S} + a_{\mu} - 1$, the angle of refraction ($= TQF'$) at the second surface. But by hypothesis, this angle is to be equal to $a$; therefore $\frac{R}{S} = 2 - a_{\mu}$. Again, by optics $\frac{R}{2 - a_{\mu}} = 1 - \frac{1}{\mu}$ is equal to the focal length of the lens; and supposing this to be equal to unity, we obtain $\frac{R}{S} = \frac{2 - a_{\mu}}{\mu - 1}$; equating this last term with $2 - a_{\mu}$, we get $R = 2. a_{\mu} - 1$; whence $S = 2(\mu - 1)$. Therefore the two radii are found on the supposition that the focal distance of the lens is unity.

Now $PQT$ being the angle of incidence as above, and $QF$ the direction of the ray after one refraction, we have by optics, $\sin. RQF = \sin. RQF'$, and by trigonometry, in the triangle $RQF$,

$$ RF = R \sin. RQF \sin. PQF;$$

and $MF = R \left( \sin. RQF \sin. PQF + 1 \right)$; also, representing the thickness $MN$ of the lens by $t$,

$$ R'F = R \left( \sin. RQF \sin. PQF + 1 \right) + 8 - t.$$}

Then, by trigonometry, in the triangle $R'QF$,

$$ SF + S - t = S. \sin. PQF = \sin. TQF';$$

by consequently, $\frac{SF + S - t}{S} \sin. PQF = \sin. TQF$; or the sine of the angle of refraction at the second surface.

Now $TQF'$, $TQF'$, $PQF' = P'Q'F'$, or the angle which the second refracted ray makes with the axis of the lens; but by trigonometry, in the triangle $RQF'$, we have

$$ PF = S \sin. TQF \sin. PQF;$$

whence $NF = S \sin. TQF \sin. PQF - 1$.

Suppose next a double concave lens, the centres of whose surfaces are at $R''$ and $S''$, and whose radii are $R'$ and $S'$, to be applied to the convex lens on the side $S$; then, neglecting the thickness of the concave lens and the distance between the two, and supposing $Q''P''$, $P''Q''$ to be the directions of the ray of light after the third and fourth refractions respectively, we have in the triangle $R'QF'$, by trigonometry,

$$ R'^{2} = R^{2} + S^{2};$$

and $\sin. P'Q'' = \sin. TQF'',$

or the sine of incidence on the first surface of the second lens; and by optics,

$$ \frac{R'^{2} + S^{2}}{R'^{2}} \sin. P'Q'' = \sin. TQF''.$$

But $P'Q'' - (TQF' - TQF'') = P'Q'F''$; and in the triangle $R'QF''$, by trigonometry, we have

$$ R'F'' = R \sin. TQF'' \sin. PQF'';$$

wherefore $NF' = R \left( \sin. TQF'' \sin. PQF'' - 1 \right)$; and considering $R''F' = \sin. TQF''$ $\sin. PQF''$, $R''F' = \sin. TQF''$ $\sin. PQF''$;

and $\sin. R''QF'' = \sin. Q''P'Q''$ $\sin. Q''P'F''$ $\sin. Q''P'P''$; for the sine of incidence on the fourth surface; therefore, by optics,

$$ \frac{NF' - S'}{S'} \mu' \sin. Q''P'Q'' = \sin. R''QF'';$$

the sine of refraction at the fourth surface; then

$$ Q''F' = \left( TQF'' - TQF'' \right) = P'Q'' \sin. Q''P''$$;
and by trigonometry, in the triangle $Q^2F^2$, we have

$$R'F' = \sin \frac{R}{q}Q^2F^2,$$

and $NP' = \sin \frac{Q}{q}N^2F^2$, and

$$S' = \frac{\sin \frac{R}{q}Q^2F^2}{\sin \frac{Q}{q}N^2F^2} + 1,$$

the focal distance of the compound lens.

These values being reduced to what they become when the incident ray $PQ$ is infinitely near the axis of the lens; that is, when the angles are substituted for their sines, there may be obtained

$$R = \mu - 1 \quad S = \mu S,$$

and

$$R' = \mu' - 1 \quad S' = \mu' S',$$

$$R + S = \mu + S' = \mu + S' = \mu + 1.$$

By means of these equations, eliminating the quantities $MF$, $NF$, and $NP$, and neglecting powers of $t$ above the first, there may be obtained a value of $\frac{1}{NP'}$: then differentiating this value with respect to $\mu$, $\mu'$, and $NP'$, and making the resulting value of the differential of $NP'$ equal to zero (which is a condition necessary in order that the chromatic dispersion may be corrected for rays near the axis), there may be obtained a value of $\frac{1}{R} + \frac{1}{S}$. Again on substituting $\frac{2(\mu - 1)}{\mu}$ for $R$, and $\frac{2(\mu' - 1)}{\mu'}$ for $S$, as above found, there will result

$$\frac{1}{NP'} = 1 - \frac{1}{\mu' - 1} \left(1 + \frac{1}{\mu + 1} + 2\right) \mu + 2\mu,$$

and

$$1 = \mu + S' = \mu + S' = \mu + 1.$$

Now the value of $NP'$ may be directly computed from the formula first investigated; afterwards assuming different values of $R'$, and substituting them in the last equation, let the corresponding values of $S'$ be found. With these values of $S'$ find corresponding values of $S'$, and proceeding according to the usual methods of trial and error, there will at length be found a value of $NP'$ agreeing with that which was computed by the direct process: the four radii will then, consequently, be determined.

Investigations relating to the dispersion of light, and rules for computing the radii of curvature for achromatic object-glasses, will also be found in an essay by Mr. P. Barlow of Woolwich, printed in the 'Philosophical Transactions' for 1827.

Though on this uniting the red and violet light by lenses, a single flat glass the chromatic dispersion is in a great measure corrected, yet when the image is examined, it is found to be surrounded by a green-coloured fringe. The difficulty of procuring flat glass of sufficient purity is also a serious impediment to the perfection of achromatic lenses for telescopes; and though great rewards have been offered for glass which shall be free from defects, the exertions of artists have hitherto been almost without success. Occasionally however flat glass is obtained nearly homogeneous, and the opticians of Germany appear, in this respect, to have been more fortunate than those of England.

The late Dr. Ritchie obtained a piece of flat glass which was, by Mr. Dollond, formed into an object-glass nearly 7 inches in diameter. It was applied to a telescope 12 feet long, and bore a magnifying power equal to 700 times: it is said to have had scarcely any spherical aberration, and to have been very free from colour. (Mem. Astr. N. C., 1840.)

In the 'Transactions' of the Royal Society of Edinburgh, 1731, there is given an account of some experiments made by Dr. Blair, from which he was led to the discovery of a fluid medium, which, being applied between lenses of crown glass, renders the compound lens completely achromatic. By adding liquid muricate acid to chloride of antimony, or sal ammoniac to chloride of mercury, he succeeded in obtaining a spectrum in which the coloured rays in each pencil followed the same law of dispersion as takes place in crown glass. Therefore, confining a small quantity of either of these liquids between the convex surfaces of two plano-convex lenses, or between those of a plano and the flat meniscus lenses, Blair obtained an object-glass in which the chromatic aberration was entirely destroyed; and he is said to have thus constructed one of 9 inches focal length, and as much as 3 inches in diameter or aperture. Object-glasses so made were for some years on sale in London; but either from the crystallization of the fluids, or the negligence of the artists in compounding them, the telescopes became imperfect, and gradually fell into disuse.

Dr. (Sir David) Brewster, in his 'Transactions on New Philosophical Instruments,' recommends the employment of sulphuric and oil of cassis for the composition of fluid lenses, by which the secondary spectrum may be destroyed; the acid being, of all known substances, that which exerts the greatest, and the oil that has the least action on the green coloured rays. The correction of the chromatic dispersion by means of fluids has also recently been attempted by Mr. Barlow, who, in combination with a convex lens of crown glass, used a concave lens, consisting of sulphurated carbon between two glasses (like that of a watch), of each of which the two faces were of equal curvature: this fluid has nearly the same refractive index as flint glass, and its dispersive power is only twice that of the latter material. The crown glass lens and the Barlow lens, instead of being close glasses, were placed at a considerable distance from one another, by which disposition an increased magnifying power may have been obtained without increasing the length of the telescope. Probably from imperfections in the form of the glass, the images of objects were found to be not well defined; and the construction, in consequence, has not been adopted.

The image formed by the great speculum of a reflector telescope is free from the inconveniences attending the chromatic aberration of light; for the angles of incidence being equal to that of reflection, in any pencil coming from a point in an object, all the rays will converge to one point at the place where the image is formed. If the surface of the speculum which is so placed that its revolution of a parabola about its axis, then all the rays in any pencil proceeding from a very remote object, as one of the celestial bodies, and being incident on the speculum in a direction parallel to the axis, would, by the nature of the parabola, converge to the focus of the curve; and on this account, an effort is always made to give to the reflecting surface of the speculum a paraboloidal figure. The advantage does not however hold good with the great majority of the surfaces of the parabola, or with the convex surfaces of the concave lenses, because the rays that fall on the mirror with a very small obliquity to its axis.

The telescope invented by Galileo consisted of one convex lens AB, and of a concave lens CD; the distance between them being equal to the difference between the focal lengths of the two lenses. In this instrument, if the object OP were so remote that the rays in each pencil of light might be considered as parallel to one another, they would be formed at its principal focus an inverted image of, that object by the union of the rays in each pencil; and if the concave lens CD were removed, the nature of the object the rays would fall on the mirror with a very small obliquity to its axis.

The line OX is the axis of the pencil of light from O; and, as this passes through the centre X of the lens AB without refraction, the angle ZO is equal to half the angle under which OP would be observed by an eye at X.
When no telescope is interposed, while one parallel to Yo being the direction of a ray in that axis after refraction in CD X Yo is half the angle under which OP is seen in the telescope; the ratio between these angles is therefore the measure of the magnifying power of the telescope; and since the angles are to one another as YZ is to XZ, nearly, it follows that YZ nearly expresses the magnifying power.

This is the construction of what is called an opera glass; and the Galilean telescope is now used chiefly for viewing objects within a theatre, or an apartment, since if considerable magnifying power were given to it the extent of the field of view would be very small.

A simple telescope may also be constructed by means of two convex lenses, which are placed at a distance from one another equal to the sum of their focal lengths. For the image being formed at the focus Z of the lens AB, which is nearest to the object, as in the Galilean telescope, and being supposed to be a plane surface, the light also being supposed to be homogenous; the rays of each pencil, after crossing at the focus and proceeding from thence in a divergent state, on being allowed to fall upon the surface of the second lens, CD may be refracted in the latter le so as to pass out from thence in parallel directions; and consequently nothing but the object may be obtained by an eye situated so as to receive the pencils.

If Xo be the direction of the axis of a pencil of light coming from O, one extremity of the object OP, which is supposed to be so remote that all the rays in each pencil may be considered as parallel to one another; then the angle ZXo is half the angle under which the object OP would be seen by an eye at X without a telescope, while the rays of that pencil entering the eye at E in the direction EY, which is parallel to OY, the angle ZYo is half the angle under which the same object is seen when viewed through the telescope. Now these angles are to one another nearly as ZY to ZX; therefore ZY will express nearly the magnifying power of the instrument. As the pencils of light from O and P cross the axis of the eye before they are united on the retina, the image of the object OP is formed in the eye in a position contrary to that which is formed when the object is viewed without the telescope; therefore, on looking through the latter, the object appears inverted.

But the image formed at OP, instead of being a plane, is nearly on a portion of a spherical surface whose centre is at X; and, on the other hand, in order that the rays in each pencil may after refraction in CD be parallel to one another, they ought to diverge from a point nearly in the surface of a sphere whose centre is at Y, the two spherical surfaces being in contact at Z: consequently when the distance between the lenses is such that the crossing of the rays in a pencil parallel to the axis takes place at a point between the foci, the rays of the diverging pencils will be at a certain distance from the point Z, at which it ought to be to permit the rays in it to go out of CD parallel to one another; the rays of the pencils which proceed from the margin of the object will not then emerge parallel to one another, and consequently that margin will not be distinctly seen. Moreover, from the unequal refrangibility of the different kinds of light, the rays in each pencil will be decomposed in passing through the lens CD, so that though the image formed in the eye may be exactly as corrected in the image at po, it would exist in the image which is formed in the eye by the rays emerging from CD.

The spherical aberration can only be diminished by diminishing the inclination at which the rays in the marginal pencils fall upon the surface of the lens, the angle of which is increased at the focus of the object-glass; that is, by using a lens of less convexity or of greater focal length; adding a second eye-glass in order finally to render the rays in each pencil parallel to one another. Thus, if it be required to preserve the same magnifying power and field of view as might be obtained with any single eye-glass; let, as before, X be the place of the object-glass, op the image formed by it, and let CD be the place of the single eye-glass; then draw a line oQ so as to bisect the angle DOY, which may be considered as the whole refraction produced by the lens CD; let G, on the right of oQ, be the assumed place of what is called the first field-glass, and draw GH perpendicular to XY, the axis of the telescope, meeting XD in H; also through H draw MK parallel to oQ, cutting Go, or Go produced, in M: again draw MN perpendicular to oQ so as to bisect the angle oQMK. Let HN meet the parallel to oQ from Y at Y; also draw RS perpendicular to the axis. Lastly, draw GU parallel to oQ to meet Xo in U, and UV perpendicular to the axis. Then, from the principles of optics, if a lens be placed at G, having its focal length noted to GV, and another at R, with the focal length is RN; the ray XoH will by refraction in the first lens take the direction RS, and by refraction in the second lens it will take the direction ST parallel to oY or DE; thus the present visual angle STR will be equal to DEY, which was obtained with the single eye-glass.

This is called the Huygenian eye-piece, and it is that which is generally used for astronomical telescopes; the object seen through it is inverted, as in the last-mentioned telescope.

If the places G and R of the two eye-glasses are given (GH being very near op; its focal length being also known), and it be required to find the focal length of RS so that the red and violet rays in each pencil may emerge from it parallel to one another, that length might be obtained in the following manner. In the pencil of rays crossing each other at H, let Ho be the direction of a mean ray, and Hr, Hr those of a red and a violet ray; these last will make with one another an angle equal to about 4 of the angle DHm, which may be supposed to be known. Now, by optical principles, if these rays are to emerge from RS in directions parallel to one another, the focal lengths of the lens for red and violet rays, viz. RF and RH must be to one another as 28 to 27, and the focci F and f must be in places determined by perpendiculars RN to the axis from points G and R, and RH supposed to be drawn parallel to FR or Fr, meets HR and Hr; that is, by finding the position of a line to be drawn from R to cut the given lines Hr, HR, so that RW may be to RW as 28 to 27. For this purpose, having drawn the straight line HR, the angles RHm, RHm, RHm can be known; let them be represented by a and b; also let the angle HRW be represented by e; then by trigonometry we shall have, after a few reductions, 27 cotan. a = 28 cotan. b = cotan. e.

In order to afford a view of objects in the same position as they appear to have when seen by the naked eye, a telescope may be formed with three lenses besides the object-glass. In the construction of this instrument, if attention is paid only to the rays which suffer a mean refraction, the first eye-glass, or that which is nearest to the object-end of the telescope, may be placed between the image formed by the object lens and the eye, with the focus of the two lenses in coincidence; by this means the rays in each pencil will emerge from the directions parallel to one another, those of the pencils which are oblique to the axis of the telescope crossing each other at some point in the latter axis. A second eye-glass is then placed at any convenient distance from the former, beyond the place where the oblique parallels cross each other; and by this lens a second image is

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formed in a position contrary to that which is formed by the object lens. Lastly, the third lens being placed between this image and the objective, the distance from the former to the focal length, the rays in the several pencils will emerge parallel to one another, and an erect image of the object will thus be formed in the eye.

The ratio between the angles under which an object would be seen by the naked eye, and that by which it is seen in the telescope, is compounded of the ratios of the focal lengths of the several lenses: thus, if \( F \) be the focal length of the objective, \( F' \), \( F'' \), \( F''' \) those of the eyepieces, reckoned in order towards the eye, the expression \( \frac{F}{F'} \) will denote the magnifying power.

But both the spherical aberration and the chromatic dispersion in such a telescope are very considerable, and before the invention of the achromatic object-glass, Mr. Dollond endeavoured to diminish the former by an eye-tube consisting of five lenses disposed so as to divide the bends of the pencils nearly equally between them. Such telescopes are not used, and Mr. Dollond needed at length in constructing telescopes with four eyepieces, from which both distortion and colour are removed as much perhaps as a removal is possible.

This is accomplished by placing the first eye-glass before the objective, the second behind it, and at a distance from it less than the focal length of that eye-glass; by this disposition the rays of mean refrangibility in each pencil which diverges from the image are not, after refraction, parallel to one another, but go on with diminishing distance from each other, and after passing through the field-lens they will form a real image, which, being re-formed near the eye: the use of these two lenses, therefore, is to cause the second image to be formed by a gradual convergence of the rays in each pencil. But the several pencils of rays are intercepted by the eye-piece, and the eye-piece of the field-glass, and the second image is thereby formed rather nearer to the eye than it would be without such field-lens: from this image the rays in each pencil diverge, and by the refractive power of the fourth eye-glass they are made to enter the eye in parallel directions. Thus an image of the external object is obtained. The field-glass might have been placed between the eye and the second image, as in the Huygenian eye-piece before described; but the aberration arising from the spherical form of the glasses is a serious objection just mentioned.

Now, in each pencil, the red and violet rays which had been united at the image formed by the objective-glass, and which there crossed each other, go on from thence diverging from each other till, on the opposite side of the axis, where they fall upon the surface of the second eye-glass: after passing through this lens, the violet ray, which is always more refracted than the red ray, gradually converges towards the latter, and at length meets it in some place short of that at which the rays of mean refraction unite to form the second image. The practice is to fix the third or field-glass exactly or nearly at the place where the red and violet rays so unite in all the pencils; for the different coloured rays crossing each other, as they are finally united by the refractive power of the fourth eye-glass, are made to enter the eye in parallel directions, and thus afford a view of the object nearly or wholly free from colour.

In forming the eye-glasses of telescopes it may be observed that there might be such as will allow the incident and emergent pencils of rays to be nearly equally inclined to their surfaces: on this account the first and fourth eye-glasses are of the plano-convex form; the flat side of that which is nearest the object being towards the latter, and that of the other eye-reflecting surfaces of the tube serves the purpose of the object-glass in refracting telescopes by forming an image at its focus: and the manner in which, in the former instance, the image is transmitted to the eye remains to be explained.

The following diagram represents a longitudinal section through the axis XY of the instrument, which is supposed to be of the Gregorian kind. AB is the tube which contains the specula, and is open at the end CB; and the extreme rays from the object are led into the tube X Y containing two lenses. MN is the anterior surface of the great speculum, which has a circular perforation, \( \text{dk} \) at its centre: G is a small speculum, capable like the former, its surface being either spherical or parabolical. It is connected with the side of the tube, and is capable of being moved in the direction of the rays XY by means of the rod PS: the latter passes through a knob Q, which is fixed to the side of the tube, and works in the knob R, which passes through an oblong perforation in the side of the tube, and is attached to the part V of the arm HK. This movement is given to the small mirror in order that its focus may be made to coincide with the place of the image formed by the great speculum; the image of a different distance from the latter according to the distance of the object from the observer.

Let O be the upper part of an object, and let ON be the direction of the rays in a pencil of light diverging from O: the rays of this pencil will, after being reflected at N, emerge parallel to one another, and will be the rays of the image. From O the rays in the pencil diverge, and having fallen upon the small mirror at \( a \), they are reflected towards the eye-piece EP; having passed through the orifice \( mh \), they fall on the lens at F, by which they are made to unite at \( p \), where the rays are formed. From \( p \) the rays in the same pencil diverge, and, falling on the lens at E, they are made to emerge in parallel directions, so that the eye is enabled to obtain distinct vision of the object in the same plane as if the convex reflecting telescopes had been used. The rays, after being reflected at \( n \) with a due concavity of the smaller mirror have united, as at \( p' \), in front of the great mirror, and the second image might have been formed at \( p'' \); in such case the rays of another, would have fallen in a different state on the lens at F, and then, by the refractive power of both lenses, would have entered the eye in parallel directions as before. The positions of the lenses at \( F \) and \( G \), and the movement of the mirror \( V \) according to the method of Huygens: and the construction differs in no respect from that which has been described as speaking of the eye-pieces of dioptric telescopes.

The magnifying power of a reflecting telescope of this kind is expressed by the formula \( \frac{VZ - Gy}{Xp - Gz} \) in which \( V \) is the focal length of the great speculum, \( Gy \) the distance of the small speculum from the image \( p \), \( Xp \) the focal length of the second eye-glass, and \( Gz \) the focal length of the small speculum for parallel rays.

In the Cassegrainian telescope the small mirror \( G \) is made convex, and it is so as to intercept the rays of the great speculum \( MN \), before the image of the object is formed; the rays of each consequentially fall at a convergent state on the small mirror, and, after reflection from thence, unite to form the image either at \( p' \) or after refraction in the first eye-glass \( F \). It is obvious that these telescopes are equal magnifiers; further, will be shorter than the Gregorian telescopes by more than twice the focal length of the small speculum; and it may add this, in some degree, the spherical aberration is corrected by the contrary curvatures of the two mirrors.

The Newtonian telescope, if we have one convex speculum at the bottom of the tube, and, in each pencil of light, the rays reflected from it fall in a convergent state upon a small plane mirror placed so as to make an angle of \( 90^\circ \) with the axis, the image \( XY \) of the telescope is formed by the second reflection the image \( Gz \) which is viewed through a Huygenian eye-piece fixed in the side of the tube \( AB \), opposite the plane mirror; that is near the open end of the tube.
The great telescope constructed by Herschel differs from the Newtonian telescope only in having no small mirror. The surface of the great speculum, which is 4 feet in diameter, has a small obliquity to the axis XY, so that the image formed by reflection from it falls near the lower side of the tube. This property of light, therefore, is a sliding apparatus which carries a tube containing the eye-glasses. The observer, in viewing, is situated at the open end of the tube, with his back to the object, and he looks directly towards the centre of the speculum, the magnifying power of which he receives through his head, in coming from the object, in no sensible degree diminish the brightness of the image.

Formerly the great speculum of a reflecting telescope was pressed into its cell by large springs attached to the interior side of the brass plate at A; but the vibrations of the springs were found to cause tremulous motions in the image at the focus of the mirror; and this effect was so great as to render reflecting telescopes inferior to those of the dioptric kind. The Reverend Mr. Edwards, who detected the cause of the tremors, at once removed it by taking away the springs (Naut. Alm., 1787); and the same gentleman further improved the distinctness of the image by enlarging the aperture to which the eye is adapted. Thus only that part of the great speculum is nearly in a vertical position, and consequently rests on its lower extremity, its weight bends it, and thus causes a change in the figure of its polished surface; on this account it is recommended that the speculum be made to rest on its side, with its concave side towards the light, and a plane or plane convex mirror, as was done in the case of the whole of the seven of its length were made divergent in passing along the intervals between the particles of vapour.

Omitting then all notice of this, and of the ill understood passages in Aristarchus (‘Clouds’) and Pliny (lib. xxxvi., o. 67) concerning the hypothesis of an eye adapted to concentrating the rays of light, it must be acknowledged that before the end of the sixteenth century lenses of glass were in constant use for the purpose of assisting the vision of men; and in the first part of the eighteenth century, of Poland, in that century, gave some obscure indications of the apparent magnitudes of objects when viewed through a segment of a sphere of glass; and Roger Bacon, in his ‘Opus Majus,’ both mentions the like fact, and expresses a purpose to investigate it, and to introduce it into his spectroscopy (he died in 1292) spectacles were already in use. He may not have actually made combinations of lenses in one instrument, but there is no doubt of his being aware of the fact that lenses might be arranged so that objects seen through them would appear to be magnified. (Bacon, Roger; SPECTACLE.)

The idea being known to the learned, it is scarcely possible to doubt that the combination of two lenses, or of a concave or convex mirror and a lens, must have been often attempted in the more curious and philosophical experiments of the time of Bacon and that which is generally considered as the epoch of the invention of telescopes. Dr. Dee, in his preface to Euclid’s ‘Elements’ (1570), having mentioned the use of the quadrant, as being calculated to increase the visual strength of an enemy’s force when at a distance, observes that the captain, or whoever is careful to come near the truth herein, besides the judgment of his eye, the help of his geometrical instrument, ring, or stave astronomical (probably for determining the measure of distances), may wonderfully help himself by perspective glasses; these last can only signify some kind of telescope, which must therefore have been then in general use. And in the ‘Panometria’ of Digges (1571) it is stated that by concave and convex mirrors of circular (spherical) and parabolic forms, or by frames of them placed at due angles, and using the aid of transparent glasses which may break, or unite, the images produced by the reflectors, the views of the microminters may be enlarged to a larger region: also any part of it may be augmented, so that a small object may be discerned as plainly as if it were close to the observer, though it may be as far distant as the eye candesc. In the preface to the second edition (1861) the editor, who with great confidence attributes to Bacon what the proportional mirrors placed at convenient angles, his father could discover things far off, that he could know or that the man at the distance of three miles, and could read the smallest inscriptions, etc., it is said that

There is probably some exaggeration in this account, but it is sufficiently manifest from it that reflecting telescopes, or optical instruments containing combinations of mirrors and lenses, were known in England before the end of the sixteenth century. The claim of Baptista Porta (between 1546 and 1615) to the invention of the telescope appears to have no other foundation than the circumstance that
ne perceived a small object to be magnified when viewed through a convex lens. It is highly probable that the telescope had been invented long before the value of such an instrument was duly appreciated; and it may have been owing to the very nature of the instrument which impressed about the mind of the inventor sunk into oblivion: about the middle of the seventeenth century, however, an effort was made to discover the traces of the invention, and Peter Borellus, in his work entitled "De vero Telescopii Inventore," which was published at Leyden in 1610, set forth that the first inventors of telescopes were two persons, the first of these was Zachariah Jans, or Jansen, and the other, Hans Lapprey, or Lippershein, both of whom are said to have been opticians, or at least mechanics, residing at Middelburg: in a letter written by a son of Jans, it is stated that the epoch of the discovery is the year 1590; but by another account, the year 1610. The same author has also given a letter from M. William Boreel (envoy from the States of Holland to the British Court) which seems to throw some light on the facts. The writer of the letter asserts that he was acquainted with the younger Zachariah Jans, when both of them were children, and had often heard that the elder was the inventor of the microscope: he adds that, about the year 1610, Jans and Lapprey first constructed telescopes, and that they presented one to Prince Maurice of Nassau, who desired that the invention might be kept secret as (the United Provinces being then at war with France) to obtain in this way, by means of the instrument, some advantages over the enemy. The writer further states that the invention became known, and that soon afterwards Adrian Metius and Cornelius Drebbel went to Middelburg and purchased telescopes at 20 florins each. This account differs from the one given by Descartes ("Dioptrics," cap. 1), who, writing in Holland, states that about thirty years previously, Metius (who was, he observes, a native of Alckmaer), having always taken pleasure in forming burning-magnifying glasses and objects at a distance, when he arrived at the extremities of a tube two lenses, one thicker in the middle, and the other thinner, than about the edge (convex and concave); and thus, he adds, was formed the instrument which is called a telescope. The "Dioptrics" was published at Leyden in 1637, and therefore the time of the supposed invention by Metius is nearly coincident with that at which, according to Borellus, it was made by Jans. From the papers of Harriot, it appears that this mathematician observed spots on the sun, in 1610, when he says to his countrymen, "telescopes magnifying from 10 to 30 times; but it is uncertain whether he got them from Holland, or whether they were made in this country; and the only conclusions at which it is possible now to arrive, are, that telescopes were discovered before and during the end of the sixteenth century, and that in both countries they were then in a form which rendered them practically useful. The two Jansens, father and son, appear to have used their telescopes in observing the heavens; and the latter is said to have remarked four small stars near Jupiter: it has been concluded from thence, that he was the first discoverer of the satellites of that planet; but though this may be, he probably did not continue his observations long enough to enable him to determine their distances from it, or the times of their revolutions. The use of the telescope, and, probably, even the knowledge of the fact that it had been invented, must have been for many years confined to the north of Europe; for it is the affection of the north that the telescope did not till the middle of the eighteenth century, when it had been invented, and then it was not till M. Huyghens, who then happened to be at Venice, heard from a German a rumour of the discovery which was said to have been made in Holland. The Italian philosopher states, in the "Sidereus Nuncius," that he had then no knowledge of the invention, and, on the return of his journey, took a friend at Paris to send him some information concerning it. On being informed, merely, that it was a tube containing glass lenses, his acquaintance with the nature of the phenomenon enabled him to enable him, he determined that one of the lenses must have been convex and the other concave, and also to determine the distance at which they should be placed from one another in order that the objects seen through them might appear magnified and distinct. Without however supposing that Galileo was here guided by theoretical considerations merely, it is easy to conceive that, as lenses of different forms were then in use for spectacles, he might have obtained from an optician some which were of different degrees of convexity and concavity; and after a few trials he must have found such as would constitute an instrument possessing magnifying power. The telescope which Galileo first used consisted of one convex object-glass and one concave eye-glass, which were placed at the extremities of a leaden tube; and the first of them magnified the heights and breadths of objects three times only. Soon afterwards he made a telescope of a more powerful kind, in which he succeeded in forming a telescope with a magnifying power which caused objects to appear about thirty times as great as they are to the unassisted eye. Galileo, who had acquired the value of the heavens received many important descensions from the discoveries which Galileo was enabled to make by means of the telescope. Except the sun and moon, not one of the celestial bodies had hitherto been observed to have any visible form or magnitude, and it was to the eye of Galileo alone that those appeared to be anything but plane surfaces: the fixed stars and the planets were alike known only as luminous and ill-defined points; but when seen through a telescope, the planets were found to have certain definite forms and markings, and by means of the instrument, some advantages over the enemy. The writer further states that the invention became known, and that soon afterwards Adrian Metius and Cornelius Drebbel went to Middelburg and purchased telescopes at 20 florins each. 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The magnifying power of a dioptric object, would appear with the ratio which the focal length of the object-glass was to that of the eye-glass, and since, by increasing the focal length of the former without increasing its diameter, the coloured border round the image is diminished, he continued two telescopes, the means of the seventeenth century were induced to form, of object-glasses, lenses which were segments of very flat spheres, that is, lenses of great focal lengths. Campani at Bologna, by order of Louis XIV., made telescopes which he termed anisopters, because he was of a foot long, and with such, Cassini, in 1671, discovered the satellites of Saturn. [Campani] M. Auzout is said to have made a lens of 600 feet focal length, but it does appear that he was able to use it as a telescope.

Huygens, who was an ingenious mechanic as well as a great philosopher, contrived to use an object-glass of long focus for astronomical purposes without placing the system of lenses in a tube. On the top of a long pole which was bent, and which formed the second image near the convex object-glass, having fixed it in a frame with joints so that its axis could be moved in any direction by means of a string which was held in the hand of the observer; and the axis being in a line passing through the celestial body, a sector was placed over the string so that it might touch the ground with its axis in the same direction. An instrument of this kind having an object-glass of 123 feet focal length, was made by Huygens and presented to the Royal Society of Edinburgh; and it is said that he was able to use it as a telescope.

There is some probability that the elder Digges had contrived an instrument which constituted a species of optics, or rather telescopes, but on account of the obscure manner in which the instrument is described, it will be scarcely necessary to notice further his claim to the honour of the invention. It appears that Père Mercenne, in his correspondence with Descartes, and in his 'Catoptrics' (1637) had suggested the use of a concave mirror to be used, like the principal lens of a dioptric telescope, for forming in its focus an image of an object; and that this image being viewed through a convex eye-glass, the same degree of perfection, could be magnified. Descartes, in his reply to Mercenne, which is said to have been written in 1639, makes several objections to the scheme, and no effort was then made to put it in practice. But the great length of the dioptric telescope is at once deduced, and in using the management of them very inconvenient, ingenious men were induced to attempt a construction in which with equal magnifying power much smaller dimensions might be employed. Mr. James Gregory of Edinburgh, in his 'Optica Promota' (1663) proposed a suggestion for forming a telescope by means of the image at the focus of a concave speculum. The mirror was to be polished metal with a paraboloidal surface, which by the properties of the curve that would be described by the rays parallel to the axis to converge accurately at one point. It is uncertain whether Gregory had any knowledge of Mercenne's treatise, or whether the idea originated with himself; but this is of little consequence, for not being able to find with what he could execute such a speculum, though he came to London for the purpose, the suggestion was abandoned, and men of science continued to direct their inquiries to the means of improving dioptric telescopes.

William III. of England had discovered the unequal refraction of light, and had ascertained that the aberration produced by this cause about the focus of a lens was many hundred times greater than that which was caused by the spherical form of the glass, he gave up the hope of being able to refract telescopes which should be free from this defect, and applied himself to the formation of specula for those of the catoptric kind: the image formed by reflection from a mirror being free from what is called the chromatic aberration, and consequently incomparably more distinct than one which is formed by the refraction of light in a lens of any transparent medium.

In the beginning of 1669, Newton having obtained a composition of metals which appeared likely to serve for a mirror, began with his own hands, to grind its surface to a spherical form; and early in the year 1672 he communicated the construction of the concave speculum to the Royal Society an account which was read in the January of that year. The radius of the concave metal in one of them was 19 inches, and the telescope magnified about 30 times. The rays, which were reflected in the concave speculum, were intercepted by a glass prism, or a plane mirror, and the image formed after this second reflection was viewed by a convex eye-glass which was fixed for the purpose in the side of the tube. In the telescope proposed by Gregory, the rays in each pencil of light, after crossing at the focus of the great speculum, were to fall upon the surface of a small concave mirror; and by this being again reflected, they were to form a magnified image upon the sky. In the telescope of Mr. Gregory, both the concave speculum and the convex eye-glass, were concave, and formed an image near the anterior surface of the great speculum; this image was to be viewed through a convex lens behind an aperture in the latter speculum, as in the telescope of Gregory. It does not appear that any of the telescopes which were constructed by Mr. Gregory may have been observed that the image formed after reflection from the convex speculum would be more free from the aberration caused by the surfaces of the mirrors, and would also be rather greater, than that which is obtained from the concave speculum of Gregory or the plane which was used by Newton.

The first reflecting telescope, in which the great speculum was perforated so that objects could be viewed by looking directly through it, was executed before the Royal Society in February, 1674. But the difficulty of obtaining metal proper for the purpose, and of giving it a perfectly spherical form, for a long time prevented reflecting telescopes from attaining the desired perfection. In 1728 Mr. Hadley succeeded in executing two telescopes, each about five feet long, which were considered good; and he gave, in the 'Philosophical Transactions' (1729), a description of the methods employed in their construction. By his advice Dr. Bradley, who was then professor of astronomy at Oxford, in conjunction with Mr. Molyneux at Kew, applied themselves to the construction of these instruments: having executed one which was satisfactory, they in 1738 instructed Scarlet and Heine, two London opticians, in the processes which they used, and these artists presently succeeded in making good reflecting telescopes for general sale. Mr. James Short, of Edinburgh, also soon afterwards distinguished himself by his skill in forming such telescopes: he attempted to execute his at first to the order of the universal, but finding that this material had not sufficient steadiness to preserve the form of its surface, he devoted himself to the improvement of metallic specula, and succeeded in giving them, it is supposed, a correct parabolic figure, by this means submitted of larger apertures than any that had before been made.

The processes adopted by Mr. Mudge in grinding and polishing the mirrors for reflecting telescopes, and in serving them the parabolic figure, are described in the 'Philosophical Transactions' for 1777. See also SPECULUM METAL.

But the reflecting telescope was destined to receive the highest power of which perhaps it is susceptible from the hands of Dr. (afterwards Sir William) Herschel: this distinguished astronomer, while residing at Bath, employed his leisure hours in grinding and polishing specula, with
which he formed telescopes, both of the Newtonian and Gregorian kinds; and about the end of 1783, that is, subsequently to the discovery of the planet which is called by his name, being aided by the liberality of the king (George III.), he began the formation of a spectrum four feet in diameter and thirty feet in length: the telescope to which it appertained is of the Newtonian kind, the observer being placed in a seat near the open end of the tube, and viewing the image through a system of eye- glasses. With this telescope, which was completed in 1785, and magnified about forty times; and on the second night after it was finished, Dr. Herschel discovered the sixth satellite of Saturn. An attempt is even now being made to form a reflecting telescope possessing a higher degree of perfection than that of Herschel; but though the great magnifying power of this instrument must always be inconvenient in the management; and, from the expense of their construction, they will ever be confined to a few persons. It is right to observe moreover that the greatest discoveries of which astronomy can boast have been accomplished with the logarithmic telescopes whose magnifying power did not exceed seven times.

While the improvement of reflecting telescopes was in progress, the efforts to combine glass lenses in order to diminish the coloured fringes by which the images of dioptric objects were surrounded proved not entirely successful; and as early as 1729, a private gentleman, Mr. Chester More Hall, of Essex, succeeded, by an opinion that the humours of the eye are combined so as to correct the defect of vision which each of the different kinds of light, contrived to combine two lenses of different kinds of glass in such a way as to form an image which was free from colours: it is added that telescopes with such object-glasses were in the possession of early workers many years ago. Dr. Euler, in 1747, guided also by the constitution of the eye, conceived the possibility of forming a lens compound of two hollow spherical segments of glass, inclined to their common axis and free from the chromatical and spherical aberrations; and in investigating the curvatures he assumed that the logarithms of the terms expressing the ratio of the refraction of a mean ray in passing from air into glass, and from air into water, were proportional to the logarithms of the terms expressing the ratio of the refractions of red rays in the same media. He was not able to obtain from any artist a lens of this nature, in which the proposed end was accomplished, and Mr. Dollond, in a short paper which is printed in the 'Philosophical Transactions' (1752), contested the justness of Euler's principle on the ground that it was contrary to one which he conceived to be founded on the experiments of Newton.

Mr. Dollond, a Swedish mathematician, having soon afterwards, in a Mémoire which was sent to the Académie des Sciences, pointed out that the principle which had been adopted by Dollond was not conformable to the acknowledged laws of refraction, the latter determined immediately on having recourse to experiment. Either guided by the object-glasses constructed under the direction of Mr. Hall, or from a series of experiments made by himself on the refraction of light in wedges of crystal and fine glass, he discovered that by employing a convex lens of the former, in combination with a concave lens of the latter kind, the rays of the different colours in each pencil of light, after refraction through both, might be made to unite at the focus, and thus produce an image of the subject free from colour. For this improvement in the discovery Mr. Dollond received from the Royal Society the Copley medal. In 1780 his son, Mr. Peter Dollond, diminished the aberration of light on account of the spherical forms of the lenses by combining together two convex lenses of the first kind with a concave lens in between: this construction is particularly advantageous, by the increased aperture which it allows when the focal length of the compound lens is short.

For several years after the telescopes thus improved by Dollond had been in general use, Euler continued to believe that all kinds of glass differed but little from each other with respect to their dispersive power, and he ascribed the success of the English artist merely to a fortunate determination of the curvatures of his lenses; but having, in the year 1764, received information that, by the addition of lead, glass had been obtained whose dispersive power was four times as great as that of the common kind, he immediately renounced his former opinion; and from that time the merit of the achromatic object-glasses, as they were called, has been firmly established. The invention of the achromatic lens is of the utmost importance, and in this country, have subsequently investigated, in scientific principles, the curvatures which should be given to the surfaces of lenses, so that the focal length of the compound lens being assumed, the chromatical and spherical aberrations might be reduced to the least possible extent.

The arrangement of lenses for the eye-pieces of telescopes is of no less importance than the formation of the object-glass; and Huygens proposed 'Dioptrics, prop. 5', in order to diminish the refraction of light at the surfaces of the object-glass as much as possible. The compound telescope consists of two convex lenses, of such curvature that the whole refraction, or the angle between the incident and emergent ray in the former construction, should be divided between the two lenses.

One method of effecting this purpose is to place the eye-glass, or that which is nearest to the object, so as to intercept the pencils coming from the object-glass, let the rays be united, and thus the image is formed after the same manner as in the eyeglasses. Another method is to have two lenses彼此 capable of being used with a micrometer; this he accomplished by placing the tube containing those lenses in such a position that, after crossing at the focus of the object-glasses, which is on a diverging state upon the first eye-glass, and, after refraction in both, entered the eye parallel directions.

With both these kinds of eye-pieces the object appears to be inverted; but eye-pieces with three lenses, by the object being surrounded by glasses, the last being produced by Rhetic, these being found defective, Mr. Dollond endeavoured to improve upon the construction by dividing the refraction at the first and rays glancing in a manner determined by Huygens, and thus he formed eye-tubes with five lenses. But some light is always lost by reflection when it falls upon glass; and, in order to diminish the evil, Dollond subsequently, retaining the Huygens' construction of the two lenses which were arranged to perform the office of the second and third (eye-piece with five glasses), in rendering the rays of red pencil convergent after the first had diminished the di- ference caused by the crossing at the focus of the object- glass; he thus succeeded in producing an eye-piece of four lenses which was nearly apolamatic, or free both from the chromatical and spherical aberrations; and since the telescopes now in common use for viewing terrestrial objects.

The chief improvements, if they may be so called, which have since been made in dioptric telescopes, consist in means which have been adopted to remove those aberrations more completely; and the natures of the different metals and glasses, employed for this purpose by Dr. Sir David Brewster, and Mr. Barlow, have been described in the article TELESCOPE.

Attempts have been made by M. Chevalier to diminish the aberrations by means of two achromatic object-glasses, placed one after the other, with a lens of thin-glass between them; and by Mr. Rogers of Leith, by a single convex plate-glass, in combination with a double achromatic convex lens being of plate-glass, and the concave lens of thin-glass. This last gentleman proposes to combine the red and violet rays in the same way so that the proper distance between the single and the double convex and to correct the spherical aberration either by proper curvatures to the surfaces of the compound lenses or by placing the two lenses at a small distance from each other. "Memoirs of the Astron. Soc., vol. iii. part 2." Dr.
T E L

Telford has suggested (Treatise on New Phil. Inst., p. 300) that it may be possible to remove, or at least much diminish, the uncorrected colour in the image by the use of two lenses of the same kind of glass with the same or different dispersive powers. He proposes that the exterior lens should have the meniscus form, the convex side being outwards; in order, from the obliquity of the incident rays to the surface, that the dispersion produced by that lens may increase in a higher ratio than its refraction, so that the images produced by the other lens may be corrected; while in each pencil the rays, after refraction through both, may be convergent.

It would be improper to omit here to mention that M. Karpitz at Modena, some years since, invented a species of achromatic telescope by a combination of four prisms, all of the same kind of glass: the refracting edges of one pair of the prisms were parallel to one another, and those of the other pair were also parallel to one another, but perpendicular to the edges of the first pair; and each pair formed an achromatic combination. By the refraction in the first pair the breadth of the object is magnified, and that in the second pair the length is magnified in the same ratio; thus the result is an image undistorted and magnified in the exact ratio of the object.

TELESCOPY (the Telescope), a constellation of stars, in the southern hemisphere, surrounded by Ara, Sagittarius, and Ophiuchus. Its principal stars are as follows:

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<th>No. in Catalogue of</th>
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</table>

TELESCOPYUM, De Montfort's name for the Cerium Telescopyum of authors. [ENTOMOSOMATA, vol. ix., 543.]

TELFORD, THOMAS. In the life of this eminent architect, which has been observed in a brief notice of the fathers of science of which he was so distinguished, an ornament in the preface to the Transactions of the Institution of Civil Engineers, "another striking instance is given of the rise of useful knowledge on record of men who have, by the force of talent and industry, raised themselves from the low estate in which they were born, to take their stand among the master-architects of their age. Telford's father was a shepherd in the adjacent district, and for many years he had been intrusted with the superintendence of some alterations at Shrewsbury Castle, which office (retained by him until death) he had to furnish plans for, and oversee the construction of, bridges and similar works. The first bridge which he designed and built was that over the Severn, at Montford, about four miles west of Shrewsbury, where the Telfords held a lease of the manor of Westerfliirk, his only son was born, on the 9th of April, 1757. His father dying while he was yet an infant, Telford's early years devolved upon his mother, and Jackson, for whom he cherished an affectionate regard, and to whose memory he dedicated this volume. At an early age he found employment as a shepherd boy in assisting his uncle, who, while engaged in the sheep-shearing season as a shepherd boy in assisting his uncle, he made diligent use of his leisure in studying at books furnished by his village friends. At the age of fifteen he was apprenticed to a stone-mason in the neighbouring town of Langholm; and in the several years he was employed chiefly in his native district, in the various occupations usually performed by a country mason in a district where there is little occasion for the higher departments of his art. The construction of plain bridges, of buildings, and of simple village churches and manses, however good opportunities for obtaining practical knowledge. Telford himself has expressed his sense of the value of this humble training, observing, that "though convenience and usefulness only are studied in the profession of the most industrious practitioners; 'tis, for 'tad adopt his own words, ' there is not sufficient employment to produce a division of labour in building, he is under the necessity of making himself acquainted with every detail in procuring, preparing, and employing every kind of material, whether it be the produce of the forest, the quarry, or the forge; and this necessity, although unprofitable to the dexterity of the individual workman who earns his livelihood by expertness in one operation, is of singular advantage to the future architect or engineer, whose professional excellence must rest on the adaptation of materials and a confirmed judgment and capable of being cultivated on a large scale. Chambers states that during this period of his life Telford was remarkable for the neatness with which he cut letters upon gravestones. In 1780, being then about twenty-three, and considering himself master of his art, he visited London with a view to obtaining employment. The splendid improvements then in progress in that city enlarged his field of observation, and enabled him to contemplate architecture as applied to the object of magnificence as well as utility; and he seems not in time to have devoted much attention both to architecture and drawing. After remaining there about two years, he removed to London, where he obtained employment upon the quadrangle of Somerset House, then erected by Sir William Chambers, and obtained by a combination of channals, at the hands of his inventor one of these telescopes, this magnified about four times.

TELESCOPICUM (the Telescope), a constellation of stars, in the southern hemisphere, surrounded by Ara, Sagittarius, and Ophiuchus. Its principal stars are as follows:
The ord of the canal a Swedish order of knighthood and other honours were conferred on him.

The completion of the Highland Roads and Bridges is of great importance. His survey was delivered to the Lords of the Treasury in 1802, and in the following year the Commission was set up to act on it. Of the work that was to their superintendence, Telford observes that 'the whole of Scotland, from the southern boundary, near Carlisle, to the extreme of Caithness, and from Aberdeenshire on the east to the Argyllshire islands on the west, has been intersected by roads, with the help of bridges; and this all in the space of twenty-five years under the same board, and (with some few exceptions) by the same individual Commissioners; and all this was done under the direction of Telford alone. The practical operations under this Commission embraced the laying of more than ten miles of new road, with twelve hundred bridges, in a magnificent and stormy region, of which five only, according to Telford's narrative, have required to be repaired.'

It should be explained that the operations of Telford were not confined to the objects defined in its title. It embraced also the Glasgow and Carlisle road; the Lanarkshire roads; the improvement of several harbours, of which the principal were those of Peterhead, Banff, Fraserburgh, Portpatrick, and Kirkwall. Highland churches and manses under a parliamentary grant of 1823. Nor were these Highland churches and manses the only buildings in which Telford acted as architect; he had, many years previously, erected a church at Paisley, and a number of kilns at the Caledonian Canal.

In the improvements of the great road from London to Holyhead, under another parliamentary Commission, pointed out in 1813, Telford had a further opportunity, carrying into effect some of the proposals of his Canal Survey. It is a noble example of his boldness in designing and technical skill in executing a work of novel and difficult character: it is described under the name of Menai Bridge, vol. xvi., p. 23, and Suspension Bridge, vol. xxiii., pp. 334-5.

Among the other works of Telford are many bridges of considerable size, in which he adopted the important principle of making the spans, and supporting them, upon piles or piers. It was in this case that Telford constructed the bridge at tug, to carry the canal over the river in a common depth of fifty-five feet. The means adopted for conquering this difficulty are fully detailed in the engineer's own narrative.

Of other canals constructed wholly or partially under Telford's superintendence it is sufficient to mention the Glasgow, Paisley, and Andromon (which was never completed to the length originally intended); the Macclesfield; the Birmingham and Liverpool Junction; the Gloucester and Berkeley (completed under his direction); the Birmingham, which was completely remodelled and adapted to the conduct of a very extensive traffic, by him; and the Weaver navigation, in Cheshire. He also constructed a new tunnel, 2936 yards long, 16 feet high, and 14 feet wide, at Harcastle, on the Trent and Mersey Canal, the original tunnel of a much less length being found long enough.

He also added many important works connected with the drainage of the fen country, especially of Bedford Level.

On the continent likewise he superintended the construction of the Gota Canal, in Sweden, a navigation of about one hundred and seventy-five miles, which fifty-nine miles is artificial canal. This navigation rises one hundred and sixty-two feet from the lake Wenerm, at one extremity, to the summit-level, and falls three hundred and seven feet to the Baltic, at the other: the rise and fall are effected by the help of thirteen locks; some of which are splendid. The canal is forty-two feet wide at the bottom, and ten feet deep. Telford visited Sweden in 1808 to make the surveys and preliminary arrangements, and again in 1813, taking with him, under the sanction of the British government, several experienced workmen to instruct the natives in the works then in progress. Upon
Telford executed some important harbour-works at Aberdeen and Dundee; but his most striking performance of this class is the St. Katherine Docks, London. Owing to the very limited space which could be obtained, it was necessary to construct these docks of irregular forms, and to adopt unusual arrangements respecting the warehouses; and these arrangements, combined with the admirable machinery employed, have reduced the time requisite for unloading a vessel in. In Bressey's 'Edinburgh Encyclopædia,' in which work Mr. Rickman says he was a subscriber, and was well acquainted with algebra, he held mathematical investigation in rather low estimation. In his early years he appears to have been tinted with democratic opinions; but after seeing the Fawcett revolution, he always studiously avoided conversing on politics, amd subjects of that kind. In all the relations of life he commanded respect and esteem; and he was particularly remarkable for his facility in access to the deserving, and especially for his ready communication of professional information; a circumstance which, added to his connection with the Gotha canal and some other continental works, procured for him the highest respect on the continent of Europe. The Russian government frequently applied to him for advice respecting the construction of roads and canals; and the sixty-seventh plate in his atlas represents the details of a road designed by him from Warsaw to the Russian frontier. The emperor Alexander of Russia promised a life pension to his son-in-law, and to the production of the project in 1808, by sending him a diamond ring with a suitable inscription. Although he was not connected with the Institution of Civil Engineers at its formation, he accepted their invitation in 1820, and became their president; and from that time, was ever unremitting in the duties of the office, having become, by his partial attention to business, a pretty regular resident in the metropolis. He ardently loved his profession, and was, without any exception, in any task before him, that all other motives became subordinate to it. He never married, and hardly had a fixed habitation until a late period of life. He was of athletic form, and reached the age of seventy without any serious illness; but in 1827 he was afflicted with a severe and painful disorder, after which he became subject to bilious attacks, under one of which he died, on the 2nd of September, 1834, at his residence in Abingdon Street, Westminster, at the age of seventy-seven.

He was buried in Westminster Abbey. The acquisition of property was always a secondary consideration with Telford; and in certain cases, especially of abortive speculations, he was ingenious in finding arguments for giving his assistance gratuitously. Even in increasing his charges as his reputation increased, he endeavoured to prevent any raising in his services, he seems to have been actuated chiefly by a sense of what was due to others in his profession, whose remuneration was in some degree dependent upon his own. After his mother's death he had few family connections to rely on; and to a great extent he was the pilot of every individual above his station in life, which was stated by his biographer as his reason for not leaving his property to relations. His will, printed in the appendix to his 'Life,' provides for the payment of handsome legacies to many personal friends; of 2000l. to provide annual premiums to be given by the Institution of Civil Engineers; and of 1000l. to the ministers of Westminster and Langholm, for the purchase of books for the parish libraries. His will also contains the following directions, 'to the depositors of his papers, to deliver the materials of the preceding notice of his principal works are chiefly derived; and from the supplementary notice, by Mr. Rickman, and some other sources, are collected the following additional biographical particulars.

Before leaving his native district, Telford acquired some distinction as a poet. He wrote in the homely style of Ramsay and Ferguson, and contributed small pieces to Riddiman's 'Weekly Magazine,' under the signature of 'Cairnрюm;' he wrote in the poet, even to the date of the Edinburgh, 5 March, 1772, description of the scenes of his early years, which was originally published in a provincial miscellany, subsequently reprinted at Shrewsbury, at the request of his friends, and afterwards inserted in the appendix to his Life. Among the most interesting are the last verses of the end of the first volume of Dr. Currie's 'Life and Works of Burns,' published at Liverpool in 1800; it is an excerpt from a poetical epistle sent by Telford, when at Shrewsbury, to the Ayrshire poet, recommending him to take up other subjects of a serious nature, similar to the 'Cotter's Saturday Night.' He taught himself Latin, French, Italian, and German, and was other times employed to converse readily in French; and he has left valuable contributions to engineering literature, in the articles Architecture, Bridge, Civil Architecture, and Inland Navigation, in the 'Encyclopædia Britannica,' in which work Mr. Rickman says he was a subscriber. He was well acquainted with algebra, but he held mathematical investigation in rather low estimation. In his early years he appeared to have been tinted with democratic opinions; but after seeing the Fawcett revolution, he always studiously avoided conversing on politics, and subjects of that kind. In all the relations of life he commanded respect and esteem; and he was particularly remarkable for his facility in access to the deserving, and especially for his ready communication of professional information; a circumstance which, added to his connection with the Gotha canal and some other continental works, procured for him the highest respect on the continent of Europe. The Russian government frequently applied to him for advice respecting the construction of roads and canals; and the sixty-seventh plate in his atlas represents the details of a road designed by him from Warsaw to the Russian frontier.
into these cantons, which perpetrated the most flagrant acts of tyranny, and treated the people like a conquered nation. The principal men of the three Waldstätte, in 1307, formed a league, which was broken by Walter Fürst, Arnold von Mäthton, and Werner Stauffacher. William Tell, who married a daughter of Walter Fürst, also belonged to the league, though without taking any prominent part in it. The object of these men was gradually and secretly to attack the towns, and to give the people an opportunity for delivering their country from its oppressors, and if possible without bloodshed. While the confederates were daily gaining new strength, Hermann Gessler of Brunegg, one of the bailiffs of Albert I., who had fled to Florence in 1306, and in the same year, of another very vexatious cause, the ducal hat of Austria, to be raised on a pole in the market-place of Altorf, and commanded that every one who passed the pole should uncover his head, and to the utter contempt of the house of Austria. William Tell with his little boy happened one day to pass the pole without paying any regard to the orders of the bailiff; and he was immediately seized and taken before Gessler. Tell had the reputation of being an excellent bowman, and Gessler devised a mode of punishment which should put his skill to a severe test. He ordered Tell's boy to be placed at a considerable distance from his father, and an apple to be fixed on his head. A crossbow and arrows were handed to Tell, who, without being observed, was to strike the apple in the head of the boy, and to shoot the apple from his own child's head. The tyrant added, that if he missed the apple, he should die. Tell succeeded in hitting the apple. Gessler had expected that Tell would strike the child, and he tried to find out some pretext for punishing the presumptuous peasant: he asked him why he had taken a second arrow? Tell boldly replied: 'It was intended for thee, if the first had hit my child.' The bailiff, delighted with this opportunity of satisfying his vengeance, ordered Tell to be bound and to be conveyed in a boat across the lake of Waldstätte to the castle at Küssnacht, the residence of Gessler, who himself accompanied his prisoner. When the boat was on the lake, a storm arose, which became so violent, that the rowers were unable to manage the boat, and proposed to Gessler to unfetter Tell and allow him to assist them, as he was known to be an experienced boatman and well acquainted with every part of the lake. Tell was freed from his fetters, and taking the rudder in his hand, he steered the boat towards a part of the rocky shore, where a flat shelf jutted out into the lake. When he was near this spot, he seized his bow, jumped upon the projecting rock, and with his foot pushed the boat further in. The boat was now in a safe condition, and Gessler and his men were safely landed. Tell knew the road by which the bailiff had to pass to Küssnacht, and lay in wait for him in a narrow defile. When Gessler came, Tell shot him through the heart. This happened in the summer of 1308. The news was followed by a series of wars between the Swiss and the Austrians, which did not terminate till the year 1469.

The conduct of Tell was highly disapproved of by his friends, as they wished to avoid bloodshed, and were not yet prepared to carry their plans into execution. After this adventure Tell sank again into his former obscurity, though he is said to have taken part in the battle of Morgarten, and was again punished, in 1350, in the river Schiessen during a great flood.

Tell has been represented as a hero and a champion of liberty, by historians as well as by poets, but his conduct, if looked into more closely, will appear in a different light. His refusal to pay homage to the ducal hat of Austria was indeed owing to a noble independence of spirit; but his obeying the inhuman command of Gessler to shoot the apple from his child's head is repugnant to all paternal feelings, and is only excusable if it was aimed at the tyrant himself. He shot his enemy from an ambush, which, although in a measure an act of self-defence under the circumstances, yet in the manner of the execution was little better than murder.

In the twelfth part of the story of Tell, notwithstanding its being commemorated to this day by chapels and other public monuments, has been doubted by several modern historians; while others, and among them Johann von Müller, regard it as a genuine history. The doubts about its truth have arisen from the fact that a similar story is told in the Wilkins Saga, and by Saxo Grammaticus, of a Danish king Harold and one Toku. The same story is also told of one William Tell and a canton of Uri who had extensive possessions in Uri, but must have lived early in the twelfth century. Another singular circumstance is that in the documents relating to the ancient Swiss confederacies, and published by Kopp at Luzern in 1833, there is a name (Tell or Tell, or Tchel, or Thilel) which seems to confirm the historical truth of at least the groundwork of the story. It was not many years after the death of Tell that it became customary for annual processions to visit the spot where Tell had escaped from the hands of Gessler. The canton of Uri built the celebrated chapel of Tell on the same spot, and it is stated that among the visitors of that year there were one hundred and fourteen who had known Tell himself. His adventure is moreover told by the same author who wrote it or after the alleged time of the occurrence.

TELL, WILHELM ABRAHAM, son of Remo Tell, minister of St. Thomas's church at Leipzig, was born in that city, 9th January, 1794. So early as at the age of 17, he showed great talent for theological study, and was principally occupied by a work on the Hebrew Text; and after being for a year or two preacher at the Nicolai church, very unexpectedly received the appointment of professor of divinity at the University of Brunswick, in 1817. On entering upon his new office, he published as an inaugural dissertation 'Topice Scripturae,' which was considered by Superintendent Bahr to be heterodox in its opinions, that it was very different from his predecessor. But Tell, who held a very high position, and was director of the 'Oberconsistorial-Rath' and Dean of Cologne. While he removed him from their immediate attacks, the distinction thus conferred upon him also in some measure saved him from opponents; and at the same time he himself was left in peace. He died at Berlin on the 27th January, 1835, his remains having been removed from the Dominican Church of Frankfort, to the Church of St. Petersburg, and thence to the Church of St. Paul, where he was buried with due honours, and his body was interred in the crypt of the Church of St. Paul. Tell had distinguished characters belonging to the reign of Frederick the Great. He was so far however from neglecting professional duties or relaxing his zeal, that he continued to apply to his theological studies with the same ardour as before, and was instrumental in promoting many beneficial plans connected with church matters and education in public schools. The vast number of sermons and other theological writings published by him, attest not only a strong devotion and earnestness in his profession, although his rejection of the dogmas ingrained upon Scripture afforded his enemies and those who lay greater stress upon speculative points than upon religious conduct and feeling an opportunity to decry him as very dangerous, rude, and unorthodox. Equally able was he in the high terms of the office of an able writer, and teacher of religion, but as a man—one man—no less estimable in private life than in his public capacity, and as exemplifying in himself that conduct which he sought to enforce upon others.
TELLERS OF THE EXCHEQUER were the holders of an antient office in the Exchequer. They were four in number; their duties were to recite money payable into the Exchequer on behalf of the king, to give the clerk of the pells (skins or rolls of parchment) a bill of receipt for the money, to pay all money according to the warrant of the auditor of receipts, and to make weekly and yearly books of their accounts. (4 Inst., 108; Com. Dig., tit. 'Court', D. 4, 14, 15.) The office was abolished by act of parliament (4 & 5 Wm. IV., c. 15) together with that of the clerk of the pells and the several offices subordinate thereto, and a new constitution established, the terminal edifices being cruciform in design. The issue of his Majesty's Exchequer being appointed to perform the duties of the four tellers. (4 & 5 Wm. IV., c. 15.)

TELLEZ, BALTHZAR, a native of Lisbon, was born, according to the statement of M. Weiss, in the Biographie Universelle, in the year 1595. Moreri states that he joined the Society of Jesus in the year 1610. In the eulogistic letter of Dom Francisco Manoel, prefixed to Teller's 'History of Ethiopia,' he is said (at least this seems to be the case) that he was an obscure philosopher, and of rather obscure) to have studied ten years, and taught forty; to have paid attention to literature during the whole ten years of his career as student, but devoted two of them more especially to philosophy, and four of them to theology. He was appointed upon tellers for twenty years, teaching in succession the most advanced literary classes in the Society's colleges at Braga, Evora, Lisbon, and Coimbra. He lectured two years on philosophy, but Manoel (in what manner is not known) says that teller was eight years professor of theology in the college of St. Antonio at Lisbon. At a later period he was appointed master of the house of the professed Jesuits in Lisbon, and ultimately provincial of the order in Portugal. He died in his eightieth year in April, 1675.

The published works of Tellers are:—1. A compendium of philosophy, entitled 'Summa Universale Philosophiae, cum Questionibus quae inter Philosophos aguntur,' published at Lisbon, in folio, in 1642; at Paris, in two quarto volumes, in 1644; and at Lisbon, in four quarto volumes, in 1652: 2, 'Chronica da Companhia de Jesus da Provincia da Portugal,' in two volumes, the first published in 1645, the second in 1648, both at Lisbon: 3, 'Historia geral de Ethiopia a alta,' in one volume, at Coimbra, in 1660. He is also said to have left in MS. a history of the Society's labours in the East. The historical works of Tellers are of more value than his philosophical treatise. The History of the Jesuits in Portugal is a valuable contribution to the history of that accomplished and energetic order. The 'History of Ethiopia,' or, more properly, the history of the Jesuit-Missions in Ethiopia, is indispensable to any one who wishes to study the history or comparative geography of Abyssinia. The first book contains an outline of the geography of Abyssinia, of its political divisions, government, and statistics, as they existed from the time that the Jesuit missionaries first entered the kingdom till their expulsion under Faculdades. The remaining five books are chiefly occupied with the history of the missionary enterprise, but contain important contributions to geography, the general accuracy of which has, on the whole, been confirmed by the testimony of later travellers. In the preface Tellers gives an account of the authorities from which he compiled his book, Manuel d'Almeida, Affonso Mendes, Jeronimo Lobo, and Pero Pays; and he has availed himself of their information both with taste and judgment.

The authorities for the statements in this sketch are the 'History of Ethiopia,' with the preface by Tellers himself, and the letter of Francisco Manoel prefixed to it; the articles on Baltherat Tellers, in the 'Bibliotheca Scriptorum Hispaniae' of Nicolao Antonio, in the 'Dictionnaire Historique' of Louis Moreri, and in the 'Biographie Universelle.'

TELLCHERRY. [Hindustan, p. 207; Malabar, p. 319.]

TELLINNA. [Conchacea, vol. vii., pp. 428, 429.]

TELLINDES. [Conchacea, vol. vii., p. 428.]

TELLURITE, a metal which was discovered in 1792 by Müller of Reichenstein, but its properties were more minutely examined by Klaproth sixteen years afterwards, and he gave it the name it now bears. It is a scarce metal. Its properties are the following:—its colour is silver-white, and it is very brilliant: it is crystalline and brittle, of a lamellar fracture, easily pulverized, and a worse conductor of electricity than antimony or bismuth. Its specific gravity, according to Klaproth, 6·115, while Magnus makes it 6·1379. It is nearly as fusible as antimony, and at a high temperature it boils, and may be distilled. When strongly heated in contact with air, it burns with a lively blue flame, green at the borders, and forms a white vapour, which has an acid odour.

The principal ores of tellurium are the following:—

Native Tellurium.—It is found crystallized and massive. Primary form a rhomboid prism; occurs in minute six-sided prisms, the terminal edges of the prism are usually replaced. Cleavage parallel to the faces of the prism. Fracture indistinct. Hardness: scratches sulphate of lime, and is scratched by the carbonate. Easily fusible. Colour tin-white or steel-grey. Lustre metallic. Specific gravity 5·7 to 6·115.

Before the blowpipe very fusible, burns with a greenish flame, and is volatilized in a white vapour. It is soluble in hydrochloric acid.


It occurs in Transylvania.

Klaproth's analysis gives,—

<table>
<thead>
<tr>
<th></th>
<th>Tellurium</th>
<th>Iodid tellerum</th>
<th>Gold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>92·55</td>
<td>7·20</td>
<td>0·25</td>
</tr>
</tbody>
</table>

100-

Graphic Tellurium. Taur argentiferous Tellurium.—Occurs crystallized. Primary form a right rhombic prism; occurs in attached flattened crystals, which are generally minute. Fracture uneven. Hardness: scratches talc, and is scratched by calcareous spars. It is brittle. Colour silver-grey. Lustre metallic. Opake. Specific gravity 5·7 to 7·23.

Before the blowpipe it readily fuses into a globule, and is reduced to a metallic button of a bright yellow colour. Soluble in nitric acid, except a yellow metallic residue.

It occurs accompanying gold in narrow veins traversing porphyry at Offenbanya, and also at Nagyag, in Transylvania.

Analysis by Klaproth.

<table>
<thead>
<tr>
<th></th>
<th>Tellurium</th>
<th>Gold</th>
<th>Silver</th>
<th>Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>60</td>
<td>30</td>
<td>10</td>
<td>1·5</td>
</tr>
</tbody>
</table>

100-

Berzelius found also a little sulphur, arsenic, antimony, iron, and copper.


By the blowpipe melts into a metallic globule. Partly soluble in nitric acid.

It occurs at Nagyag in Transylvania, and in the Altai Mountains in Siberia.

Analysis by Klaproth:

<table>
<thead>
<tr>
<th></th>
<th>Tellurium</th>
<th>Gold</th>
<th>Silver</th>
<th>Sulphur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>44·75</td>
<td>26·75</td>
<td>19·50</td>
<td>0·50</td>
</tr>
</tbody>
</table>

100-


Before the blowpipe is fusible on charcoal, and covers it with oxide of lead; reducible into a grey metallic globule, which eventually leaves a button of gold.

It is found at Nagyag and Offenbanya in Transylvania.
Analysis of the ore from Nagyag, by Klaproth:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tellurium</td>
<td>32.2</td>
</tr>
<tr>
<td>Lead</td>
<td>8.3</td>
</tr>
<tr>
<td>Gold</td>
<td>9.0</td>
</tr>
<tr>
<td>Silver</td>
<td>0.6</td>
</tr>
<tr>
<td>Copper</td>
<td>1.3</td>
</tr>
<tr>
<td>Sulphur</td>
<td>3.0</td>
</tr>
</tbody>
</table>

100%

Brandes and Berthier have also analyzed this ore from Nagyag: their results differ considerably from the above, and also from each other.


Pisible by the blowpipe, and disengages the odour of selenium. Acted on by nitric acid, and the solution is precipitated by water.

It is found in Norway.

Analysis of ore:—

<table>
<thead>
<tr>
<th>Substance</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tellurium</td>
<td>34.6</td>
</tr>
<tr>
<td>Bismuth</td>
<td>60.0</td>
</tr>
<tr>
<td>Sulphur and traces of selenium</td>
<td>4.8</td>
</tr>
</tbody>
</table>

We shall now describe the more important binary compounds of tellurium, beginning with

Oxygen and Tellurium.—It has been already mentioned that when tellurium is heated in contact with air, it burns, and a white vapour is formed: this is oxide of tellurium, or tellurous acid. It may also be obtained by the action of nitric acid on the metal; by adding water to the solution, part of the oxide is precipitated, and the remainder is obtained by evaporation to dryness. The properties of this substance are such that it is a white granular amorphous powder, which slowly reddens moist litmus-paper, and is insoluble in water and acids. It is dissolved by a solution of potash or soda, and by fusing with their carbonates; volatile salts are formed: when these are decomposed by acids, hydrated tellurous acid is precipitated, which, if washed with very cold water, and dried at a temperature not above 35°, may be preserved without suffering change, and is soluble in water, acids, ammonia, and the alkaline carbonates, which last it decomposes: the aqueous solution reddens litmus-paper: when zinc, tin, and some other metals are left in a solution of this acid, they oxidize it, and metallic tellurium is precipitated in the state of a black powder. Its salts are called tellurites.

It is composed of—

- One equivalent of oxygen
- One equivalent of tellurium

Equivalent: 32

Sesquioxide of Tellurium, or Telluric Acid.—This is obtained by fusing tellurous acid with nitrate of potash: by this it is oxidized completely, and the result is tellurate of potash: when chlorid of barytes is precipitated, which, being decomposed by sulphuric acid, yields a solution of telluric acid: this yields hexagonal crystals of the acid: it acts but feebly as an acid; the dilute solution reddening litmus-paper with difficulty: its taste is rather metallic than sour: the crystals contain water, two-thirds of which they lose at about 212°, and the remainder below a red heat becomes a mass of a fine orange colour, which is completely insoluble in water, either cold or boiling, or hot hydrochloric or nitric acids, or solution of potash. It is decomposed at a high temperature, and converted into a white powder, which is tellurious acid. Its salts are called tellurites.

It consists of

- One and a half equivalent of oxygen
- One equivalent of tellurium

Equivalent: 44

Hydrogen and Tellurium.—When tellurium is alloyed by fusion with tin or zinc, and the compound is acted upon by hydrochloric acid, the hydrogen of the decomposed acid dissolves tellurium, and tellurium hydride gas is obtained. This gas has a smell somewhat resembling that of hydrolysulphuric acid: it is soluble in water, forming a claret-coloured solution; and, as it possesses acid properties, though feebly, it has been called hydrotelluric acid.

It decomposes many metallic salts, yielding an alloy of tellurium with the other metal. Chlorine, nitric acid, and the oxygen of the air, all take the hydrogen from the tellurium.

It consists of

- One equivalent of hydrogen
- One equivalent of tellurium

Equivalent: 32

Chlorine and Tellurium form two compounds. When a feeble current of chlorine passes over tellurium at a high temperature, the dichloride formed passes over as a violet-coloured vapour, which condenses at first into a black liquid, and eventually into a solid of the same colour. It is decomposed by the action of water into metallic tellurium, which is precipitated, and chloride of tellurium remains in solution.

It is comprised of

- One equivalent of chlorine
- Two equivalents of tellurium

Equivalent: 36

The Chloride of Tellurium is obtained, as before stated, by the action of water on the dichloride, but is better prepared by treating a larger quantity of chlorine over tellurium at a lower temperature than in forming the dichloride. It is volatile, and any excess of chlorine being separated by agitation with mercury and rectification, a vitreous crystalline solid is obtained, which is composed of

- One equivalent of chlorine
- One equivalent of tellurium

Equivalent: 36

Sulphur and Tellurium combine in two proportions: the sulphuret is obtained when hydrolysulphuric acid gas is passed through a solution of chloride of tellurium, tellurium acid, or of a soluble tellurite. It is of a dark brown colour, and is soluble in a solution of potash. It is formed of

- One equivalent of sulphur
- One equivalent of tellurium

Equivalent: 36

Pernisulphur of Tellurium is obtained by mixing a solution of persulphur of potassium with one of the acid of telluric acid. It is of a deep yellow colour; but is a very unstable compound, for it speedily becomes black and is converted into protosulphuret.

Example, Teliophorus, or Swainson’s name for a genus of Laniaceae

Bill of Telluropo us leucogranum. (See, Classification of Birds, vol. 1.)

TELUUGU or TELINGA LANGUAGE. (History, p. 220.)

TEMANZA, TOMMASO, an architect who is best known by his writings relative to his art than by the buildings which he executed, was the son of an architect, but the nephew of another architect, Giovanni Scarpetti; and was born at Venice in 1705. Having finished his mathematical studies in the school of Padre Niccolo Corona, and the eminent Marchese Poleni, he was appointed, although then only twenty-two—one of the assistants of the Commission of Engineers, and in 1724 became chief of that body on the resignation of Bernardino Trinini, a few years before the latter’s death (1747). His share in the hydraulic commission caused him to be involved in literary disputes, he being one of the people of Padua by a publication entitled Dell’ Arte Corso di Fumi in Padova e suoi Contorni; whereas it asserts that their ancestors had attempted to turn the
T E M

TEMEWAR, the BANAT OF, is one of the finest and most remarkable portions of Hungary, comprehending the counties of Temoral, Wallachia, and Banat, and the German and Walachio-Ilyrian districts. These two districts are sometimes not considered as part of the Banat. The area of the whole is 11,340 square miles, and the population is said to be above a million; but there is no part of the Austrian empire which is more difficult to ascertain than that of Hungary. It is bounded on the north by the Maros, separating it from the counties of Arah, Consgrad, and Csanad; on the west it is separated by the river Theiss from the counties of Consgrad and Bac, and the Crnk district, and by the Danube from Slovakia; on the south by the Danube from Servia; and on the east by the Cerna, and the offsets of the Carpathians, extending from Transylvania, from little Wallachia, and Transylvania, to the Moldavian frontier district of Kant. It was a frontier province against the Wallachians, the Bulgarians, and the Turks. The latter however got possession of it in 1552, and retained it till 1716; when, in consequence of the Rie, the name of Eugene, it was restored to Austria by the treaty of Passa-

rante in 1718. Under the disorderly rule of the Turks, the country was overrun with banditti, so that many parts were nearly uninhabited and desert. Field-Marshal Count Francis Mercy d'Argenteau, who was appointed governor, died in 1736, and Baron Engelsbock, his successor, exerted themselves to improve it by inviting numerous colonists from Germany, Italy, and France, building towns and villages, establishing manufactories, and erecting forts. But the spirit of the old establishments were ruined, and a great number of the foreign colonists quit the country. When peace was restored, numbers of Servians, Rascians, Macedonians, and Bulgarians, came from the Turkish provinces, bringing their property with them. In 1752 the government was changed from the military to the civil form, and, with the exception of a temporary check during the Seven Years' War, the progress of improvement in this province has been constant.

The Banat is remarkable for the great variety of cli-

mate: in many parts the snow on the high mountains and in the deep ravines never melts, and in other parts it is severely in winter. A third part of the country is mountainous, and the rest everywhere well watered. The country has been gained by draining the morasses on the banks of the Theiss and the Danube, and in the elevated tracts by clearing the old forests, is ex-

tremely fruitful. In the middle of the two military fron-
tier districts lies the most extensive sandy tract in the whole Austrian empire, in which there are however many oases. The principal points of the high mountains are Gugy, Nyitra, Gojdan; on the lower mountains are vast forests and fine pastures. The principal rivers are the Danube, Theiss, Maros, Kirius, Narey, Temes, and Bega. In 1748 and the following years canals were made in order to drain the marshes: the two most important are the Banat and the Bega canal, which traverses the whole of the counties of Temes and Ternoral, and is conducted into the Theiss. By the draining of the marshes, tracts which in the latter half of the last century were stagnant pools, the source of great evil, are reclaimed, and under corn-fields, or, where they have been imperfectly reclaimed, with crops of rice, and the salubrity of the country has been greatly improved. The protection which the mountains give against the east and north-east winds, and the mitigation which the north-west wind experience in traversing the great plain, raise the temperature to that of a southern country, and the rich soil yields abundant crops. The wheat and maize of the Banat are of the finest quality. It has been made of cotton and silk, and in some parts a sweet wine is produced. There is no part of Hungary in which colonization has been attended with such favour- able results by the settlement of industrious foreigners as the Banat, where the climate is so much more suited to corn-fields, and where, with the exception of some marshy tracts, the climate is very healthy. Mineral springs are frequent, but little use is made of them. Only those of Me-

ludia, which were known to the Romans by the name of Thermes Herculis, are still much resorted to, especially by the Wallachian and Moldavian nobles. About this place, as well as in other parts of the Banat, Roman antiquities are frequently found. The population of the Banat, which is continually increasing, is distributed among five foreign set-

ters, consists chiefly of Wallachians, Rascians, Bulgarians, gypsies, Germans, Jews, French, Italians, and other foreign settlers: among whom, in the mountainous districts, the Wallachian language is prevalent; in the towns and large villages, the German, and in the districts of the military frontier, the Illyrian. The natural productions are horses, horned cattle, swine, wheat, maize, rice, flax, hemp, tobacco, fruit, wine, wood, madder, saffron, silk, timber, honey: game of all kinds and fish abound. The minerals are gold, silver, copper, zinc, and some iron. The gold is obtained by the gypsies, by washing the sand of the rivers. Between 4000 and 5000 workmen, chiefly Wallachians, are employed in the mines. The chief occupations of the inhabitants are agriculture, sheep and cattle. There are no manufactures. The county of Temeswar, as has been stated, is one of the three included in the Banat, and needs no separate description. A circle of the county bearing the same name.

TEMESWAR, the capital of the Banat and of the county, is a royal free city, situated in 45° 45' N. lat. and 21° 10' E. long., at the confluence of the Temes and the Bega, and on the Bega canal, in a part of the country which is rendered unhealthy by the stagnant waters in the vicinity. It is one of the strongest fortresses and one of the handsomest and most regular towns in the whole Austrian empire. While the town was in the possession of the Turks it consisted of only a few houses and an old castle, which is still habi-
ted. When Prince Eugene, after the battle of Parnawa, in 1718, the strong fortifications were erected as a bulwark against the Turks, and the town was built in the modern style. The inner town, or fortress, is surrounded with triple walls and moats, and consists of three departments of houses, in straight, broad, well-paved streets. There are three gates, the Vienna, Peterwardien, and Transylvania gates, which are defended by strong blockhouses. The casemates are capable of containing 3000 men. Temeswar is the seat of the Catholic bishop, with his chapter and seminary, and of the schismatic Greek bishop of Temeswar: here too are the court of justice for the three counties, the offices of the governor of the military frontier, a military academy, a great arsenal, and many other offices connected with the military and civil ad-

ministration. The most remarkable buildings are—1, the old strong castle of John Hunyady, built of freestone, the
only relic of the antient Temes; 2, the churches, viz. the fine Gothic cathedral of St. George, belonging to the bishopric of Csanad, the cathedral of the schismatic Greeks, the Roman Catholic parish church, the churches of the Piarists, and of the seminary; 3, the elegant residence of the bishop of Csanad, the remarkably fine building in which the chapter resides, the house of the commander of the military frontier on the parade, the large and handsome county hall in the great square, the barracks, the military and civil hospitals, the synagogue, the Rasican town-hall, which contains the great hall and the assembly-rooms. Some of the churches were formerly Turkish mosques.

Temeswar has three suburbs, one before each gate, at the distance of 300 paces, with fine avenues of trees leading to them. Before the Vienna gate is the suburb Michaela, inhabited by Wallachians, who have their own churches, and whose occupations are agriculture and the breeding of cattle. Before the Peterwarden gate is Josephstadt, an extremely pleasant suburb, with very broad streets, and trees planted in front of the houses. Many wealthy families reside here in the summer to enjoy the country, and formerly to avoid the fevers that usually prevailed in the town, but which have greatly abated since the surrounding marshes have been drained. The inhabitants of this suburb are Germans. The fine Bega canal passes through the middle of this suburb, and communicates with the Danube. Before the Transylvanian gate lies the manufacturing suburb (Fabriken-Vorstadt), so called from the great manufactories that were formerly established here, but most of which were broken up in 1738, when a Turkish war was apprehended; the suburb however retains its name. The Turkish merchants have their warehouses here. In this suburb there is a curious hydraulic engine, by means of which water is conveyed in iron pipes underground to the fortress: the inhabitants are chiefly Rascians. There is a considerable trade at Temeswar in the productions of the country, and some manufactures of cloth, paper, iron-wire, and silk. The population of the fortress is about 3000: and that of the whole town, including the suburbs, 13,000, besides the garrison.
TEMNU'rus. [Trogonidae.]
TEMPE. (Tempe, called also Thessala or Thessalica or Pothictos Tempe) was the ancient name of a beautiful valley in Thessaly, lying between Mount Olympus on the north and Mount Ossa on the south, near the mouth of the river Peneus, which runs through it. It is a narrow girt, not quite five miles long, opening on the east into a wide plain which extends to the Thermaic gulf. It forms the only break in the great chain of mountains by which Thessaly is enclosed on all sides. Antient traditions asserted that the great plain of Tempe was at one time covered with water, which was at length discharged by the vale of Tempe, which was opened by a stroke of Neptune's trident, or (according to another legend) by the strength of Hercules. The appearance of the country has led modern travellers to accept the mythical story as meaning that the pass was opened at some period by a great convulsion of nature. The rocks which enclose it rise in precipices from the bed of the Peneus, and at the narrowest point these precipices approach so near each other that the road is cut in the face of them.

The Greeks reverenced Tempe as the place from which Apollo transplanted to Delphi his sacred laurel, and admired it as the most beautiful spot in their country. The most vivid description of it is that of Aelian (Var. Hist., i. 1). See also Ovid, Metam., ii. 569, Sc.; Livius, xix. 6; Plin., Hist. Nat., iv. 8; Crater, Dea Grec. i. p. 379; the Tours of Clarke, Holland, Dodwell, and Geil; and Thirwall's Hist. of Greece, i. p. 5.

TEMPERAMENT (temperamentum, spars) is a vague and unsatisfactory term, but still it is one which, as Dr. Mayo observes (Pathology of the Human Mind, London, iimo. 1838, Append., p. 162), has for many centuries been a convenient generalization; and, unless we pretend to sufficient knowledge of the laws of logic, we must still be contented to use this or some other equally indefinite term. The word means literally a tempering, or mixing together, and may be defined to be a peculiar state of the system common to several individuals, which results from the various proportions in which the elementary parts of the human body are mixed up together, and which gives rise to a tendency to certain phenomena. There is besides in each individual a further peculiarity of combination, which serves to distinguish his temperament from that of any other person, to whom however he may in other respects bear a great resemblance. This individual temperament is called an idiosyncrasy (i.e. a peculiar mixing together), and, as the two words are sometimes confounded, it may be useful to have pointed out the distinction between them. All the different systems of organs in the human frame are accurately adjusted to each other, so as to produce one harmonious whole. If the disproportion be too great, disease ensues; but there are many gradations, compatible with health, where yet this disproportion is very observable. The predomina
tance of any particular system of organs modifies the whole economy, impresses striking differences on the results of the organization, and has perhaps almost as great an influence on the moral and intellectual as on the physical faculties. This predominance establishes the temperament: it is the cause of it, and constitutes its essence. The antients paid considerable attention to the subject of temperaments, and pointed out various peculiarities in the constitution and actions of the human body, which have been seen so far to coincide with general observation, that their nomenclature has continued in very general use even to the present day, although the hypothesis on which it was founded is universally discarded. They described four temperaments corresponding to the four qualities of Hippocrates—hot, cold, moist, and dry. It was supposed that there were four corresponding primary components of the human body, namely, blood (Ela), phlegm or phlegma (Alb., and the two kinds of bile, the atherial or black bile (Koelus) and the yellow bile (Koilia), and the black bile or ataraxia (Koilia, Koilia); and the preponderance of one or other of these components in different persons produced the different temperaments. The four primary princi
ciples of living bodies were supposed to be compounded of the simple elements or qualities of nature thus: hot and moist produce blood; cold and moist, phlegm or piitvita; hot and dry, yellow bile; and cold and dry, black bile. Bodies in which blood superabounds are of the sanguine tempera
ment; if phlegm is in excess, the phlegmatic temperament is developed; if yellow bile, the choleric; and if black bile, the melancholic or atarabious temperament.

The following is a description of the four temperaments given by Paulus Aegineta (De Re Medic., lib., cap. 81), in Mr. Adam's Translation (London, 1834, 8vo.):—

'Those bodies which are of a hotter temperament than the moderate will have their teeth earlier than usual, and their eyes will grow in like manner. They feel a desire to eat and have less fat; they are of a ruddy colour, and have their hair black and moderately thick, and their veins are large. But if such a one be also fat and brawny, and have very large veins, he is in the habit, and not from nature. The following are the symptoms of a sanguine temperament: such bodies appear cold to the touch, are without hair, and are fat; their complexion, like their hair, being tawny. But when the coldness is great, they are pale, leaden, and cold, have thin veins; and if lean, this temperament does not proceed from nature, but habit. The skin is dryer and more slender than the temperate, the hardness indeed being inseparable from the dry temperament; but leanness not only follows the excessive temperaments, but also those which are sanguine and by long habit. It is peculiar to the humid temperament that the body is oppressed by things of a moist nature. The warm and dry temperament, in other words, the choleric, is extremely shaggy, having the hair of the head in early age of rapid growth, black, and thick; and in after-life, thin and colourless. The veins are large, as are likewise the arteries, which beat strongly. The whole body is firm, well articulated, muscular, and without obesity; and the skin hard and dark. When the temperance is cold and humid, or phlegmatic, the skin is narrow, and, like the rest of the body, without hairs; the skin is soft and white, and its hairs somewhat tawny, especially in youth; and such persons do not get bald when they grow old: they are timid, spiritless, and inac
tive; their veins are weak; their muscles and their muscles and legs are feeble, and their joints ill
formed; and they are bandy-legged. But should the hu
midity and coldness increase, the colour of their skin and hair becomes tawny, or, if they increase still more, pale. The hot and humid, or sanguine, temperament is softer and more fleshy than the proper, and, when it increases much, is subject to putrid disorders; but if it be only a little more humid and much hotter than the moderate, the bodies of such persons are only a little more fleshy than the moderate, but they are much more hairy and hotter to the touch. But if the cold and dry grow equally together, and form the melancholic temperament, such persons have naturally their bodies hard, slender, and white, with fine muscles, small joints, and with veins, they are cold to the touch. Although slender, fat is mixed with their flesh. The colour of their hair is correspondent to the degree of constitutional coldness. As to disposition of mind, they are genial, kind, and good-breeding, in a word, with regard to the compound temperaments, they are always to be distinguished by the marks of the prevailing quality.'

The due admixture of these different qualities was sup
posed to constitute the several forms of temperament or con
stitution (stelasia), of which the following is Paulus Aegineta's description (Ibid., i. 60):—That man is in the best temperament of body when it is in a medium between all extremes, of leanness and obesity, of softness and hard-
ness, of heat and cold, of moisture and dryness; and, in a word, who has all the natural and vital energies in a faultless state. His hair also should be neither thick nor thin, neither black nor white. When a boy, his locks should be rather tawny than black, but when an adult, the converse.

Further information respecting the opinions of the antients on the subject of the temperament may be found in the treatise of Hippocrates, De Natura Hominis, tom. i., ed. Kühn; in Galen's works, De Elementa ex Hippocrate, tomo. i., ed. Herzenstein, and De Optima Constitutione, tom. iv., De Sanitate Tuenda, lib. vi., tom. vi., and his Art Medica, tom. i.; Orisisia, Synopsis, lib. v., cap. 43, sq.; Aëlius, Libri Medicinales, lib. iv., cap. 53, sq.; 2lly Abbas, Theor., lib. i.; Averroes, Collig., lib. iv.; Alisahbarit, Theor., tract. vi.; and Avicenna, Canitia.

After the revival of letters, this fourfold division was adopted in its most essential parts by all the most eminent physiologists. Stahel ingeniously adapted it to the modern doctrines of the humoral pathology; and even Boerhaave, although he increased the number of the temperaments to eight, and relinquished the erroneous opinions of Hippocrates and Galen respecting the constitution of the blood, yet he retained the characteristics of his temperament from the principles of the humoral pathology, and supposed them to be formed merely by different combinations of the four cardinal qualities. Many late physiologists have not had a doubt whether the external characters associated with the four temperaments are real and constant signs of diversity in bodily structure, and enable us to distinguish the principal varieties of constitution which exist. Several attempts have accordingly been made to establish a more satisfactory manner the varieties of organization and the resulting varieties of disposition, which are chiefly interesting with regard to pathology. Hoffmann and Cullen have indeed retained the old division, supposing that the theory of the antients as to the peculiarities of constitution was founded originally upon facts, though subsequently combined with an erroneous theory. Haller seems to have been the first who decidedly opposed the antient doctrine, not only by showing that there was no foundation for the varieties of the temperaments in the peculiar nature of the fluids, but by substituting in their place the vital actions of the system. Darwin proceeded upon the principle of Haller; and, in conformity with the hypothesis which he adopted of reducing these actions to the four heads of irritation, sensation, volition, and association, he formed four temperaments in which these qualities were supposed respectively to prevail. The only attempt however to improve the physiological theory of the fourfold division which has been attended with any degree of success is that by Dr. Gregory, who to the four temperaments of the antients added a fifth, which he called the nervous, and bestowed upon three of the others the new appellations of the ionic, the phlegmatic, and melancholic. Dr. Prinsep, however restrains the number to four, and designates them by their original names; remarking that only four strongly marked diversities of external character present themselves to observation; that the nervous temperament is not so distinguished; and that therefore, as this is an essential part of the original scheme for the distribution of temperaments, the improvement proposed by Dr. Gregory is lame and defective. These four varieties then of external character, more liable to association and general than to specific differences of constitution, and likewise of morbid predisposition. There is no doubt that persons having the complex and other signs of the sanguine temperament are more liable to certain classes of disorders than the phlegmatic or melancholic, while the latter have their own peculiar tendencies. The sanguine, having a fully developed vascular structure, and therefore a vigorous circulation of blood, a warm skin, and a high degree of organic sensibility, is more liable to irritation and powerful impressions from external agents than those of more languid vital functions. They are subject in a greater degree to severe inflammatory disorders, and disorders of this class are in them more acute: they bear however, better than persons of a sanguine habit, the agitations of blood-vessels, and the other measures which are found to be the proper remedies for these diseases. The greater fulness of blood-vessels, of those at least which are near the surface, the greater warmth of the skin, and the florid complexion of the face; all afford reason to believe that the irritation given to this temperament is not wholly unhealthy. We likewise find that sanguine persons are more liable to hemorrhages (to those at least which are termed acute), as arising from excess in the force of circulation through the arteries. Individuals of the phlegmatic temperament are more liable to suffering from, or connected with, a low degree of vital energy. Local congestion of blood arising independently of general excitement is under this category. Glandular and tubercular diseases are more frequent in the sanguine than in any other temperaments. Insanity, or attacks of the phlegmatics, are less acute and more disposed to terminate in chronic consumption than those of the sanguine constitution, when at least the latter have been treated by appropriate remedies. The relations of the choleric to the melancholic temperament are similar to the relations which the phlegmatic bears to the sanguine; the former displays greater vitality both in health and disease, than the latter. The choleric and sanguine, when affected by diseases of the nervous system, have complaints of greater violence and acuteness; mania or raging madness belongs particularly to the observations of M. Esquirol and many others) to these constitutions. The melancholy temperament is most prone to monomania, attended with depression and melancholy illusions. Hypochondriacal persons more frequently affect the phlegmatic and melancholy temperaments, than the former is occasioned by individuals who have not only some of the external characters of the sanguine temperament. The most severe cases of hypochondriacal affections of Dr. Prichard, and those which approached most nearly the character of melancholia, have certainly occurred in individuals of a dark leading complexion, fixed and aspers, and lank coal-black hair.

But it is not merely on the body, both in its vital and morbid state, that the temperament exerts its influence. The composition of the different temperaments leads to physical organization to the intellectual, and even moral, faculties is equally marked and apparent. The action of mental peculiarities to the structure of the body has been observed by medical authors of every age, and has been stated and explained in different ways. Hippocrates said that the soul is the same in all men, but the body is different in different individuals. The soul, however itself both in greater and in less, for it undergoes change neither by nature nor by necessity; but the mind depend upon the body; there are many states of the latter which sharpen, and many which blunt, the 'De Fietia Ratione, lib. i., § 21, tom. i., p. 650; hippocrates, the latter said to have been addressed to Hippocrates, asserted that 'the intelligence of the body depends greatly on the body, the diseases of which depend on the mental faculties, and draw the latter into consequence. Among the end of Galen there is a treatise entitled Good and Evil Tempe In the sciences and in philosophy we find this doctrine most fully developed, and a complete classification for a division of human characters. According to Hippocrates, the choleric temperamental organization disposes men to precipitate and impulsive conduct, to anger, audacity, impatience, tameness, sedition, and the like. On the other hand the sanguine by the blood through the vessels of the whole body, which is the result of its circulation, to the great irritation of the body, such persons timid, slow in business, anxious, averse with difficulty of forming or uttering opinions. The guine by a happier temperament are rendered easy and supple to care. A very abundant sanguinephlegmatic to be lazy, somnolent, and torpid. Certain temperament qualify men for particular situations. Melancholic men, says Hoffmann, should be the ministers and counsellors; choleric persons should be commanders, generals, foreign secretaries, and ministers of all business requiring energy and dispatch, as it was with some such impression concerning the peculiar qualities of this temperament that Napoleon, after
plunging of its inconvenient effects in deranging his temper, is said by M. Séguir to have added, 'Cependant sans commettre de grands bâilllements.' Sauvages men, continues the writer also mentioned, are fit for courtiers; but individuals who have the misfortune to be of the phlegmatic temperament, being quite incompetent to any elevated condition, must be made common soldiers, and their mean temperature to be a brimstone employment. (De Temperamento Fundamento Morborum, § 10, quoted by Dr. Pritchard.) It is extremely improbable that an opinion should have held its ground for so many ages among men of observation, especially on a subject requiring no abstruse research, without some foundation at least in fact. The doctrine of temperaments is true to a certain extent, and has ever been confirmed by so many writers of medicine, that it is impossible for any person who considers all the physiological facts that present themselves in connection with this subject to doubt that with every temperament particular mental qualities must be associated, although it is manifest that many writers have indulged their fancy on this subject, and have gone into more full and minute details than experience will establish. The same may be said of phrenology, which science the doctrine of the temperaments is in this point of view closely connected, as modifying the physiology of a certain principle of the brain. It is the scientific subject of this length of Dr. Pritchard's article on 'Temperament' in the Cyclopaedia of Practical Medicine, from which most of the preceding observations are taken, and also of Few, Boét, and Richerand, and Müller's works on Physiology, and other writers there quoted.

TEMPERAMENT. Tuning.] TEMPERATURE. Atmosphere; Climate; Isothermal Lines. TEMPERATURE OF THE EARTH. (Geology, p. 133.)

Temperature. It is intended under this head to notice the law of the variations of temperature on the earth and the facts connected with the variations of terrestrial magnetism; the formulæ expressing the mean temperatures at different places being, as yet, very far from affording satisfactory results, and observations being too few to serve as a basis for correct theory. In Climate there is given some general, but vague, observations concerning the distribution of heat at the surface of the earth, and under Isothermal Lines there will be found the estimated values of the mean temperatures at the magnetic equator and at the magnetic poles. With respect to the former, it may be said to have been tolerably well determined, and to be nearly uniform quite round the world; but the mean temperature at the pole can only be inferred from the uncertain evidence afforded by an application of the law of the distribution of heat, which was never found to hold good in the north of Europe, and a correction founded on an estimated amount of the frigorous influence of ice: even the determination thus obtained is rendered still further uncertain by the fact that the decrease of temperature in proceeding from the equator northwards is different on meridians which differ considerably in longitude.

Before this difference of temperature on the same parallel of latitude in the old and new continents was known or regarded, a simple formulæ was thought sufficient to express the mean temperature at any parallel of terrestrial latitude. The celebrated Tobias Mayer, from such mean temperatures as had in his time been observed, found the mean temperature of 49° N. lat., and in long. 100° (110° W. long.), the mean temperature is as low as 13° C.; and from above 60° observations at Spitzbergen (78° N. lat.) Mr. Scoresby found the mean temperature to be 16° C.; a mean temperature of 17° C. is also found on the American continent, in 60° N. lat.; and it may be inferred that, between the parallels of 65° and 78°, and near the meridian of Winter Island, there exists a pole of minimum temperature. The mean temperature of the earth at the poles has not been well ascertained; but since at North Cape in Lapland the mean temperature is that of freezing water, and in Siberia, as low as the parallel of 60° N. lat., the surface of the ground is constantly frozen, it is evident that the temperature at the poles must have some point as a focus in the northern part of the Asiatic continent: hence, for determining the mean temperature of any place, no formula which does not involve the position of the place with respect to the two foci of coldness can be expected to satisfy the phenomenon.

This circumstance has suggested to Sir David Brewster the formula $T = (t - r) \sin \phi + \sin \phi \cos \phi \sin \frac{n}{2} \cos \phi$. For the mean temperature at any place; $T$ being that temperature, $t$ the mean temperature at the terrestrial equator, $r$ the temperature at the poles, and $n$ an exponent, which may be determined in any equal time, at the magnetic equator and at either of the poles of magnetic intensity: the exponent $n$, both for temperature and intensity, is to be determined by means of observations, and Brewster considers that this formula may be the value of it in the formula for temperature.

The similarity of character which is presented by the isothermal lines and those of magnetic dip and intensity, which respect to two poles in one hemisphere of the earth, and the facts connected with the similarity of the isotherms and the isobars, are evidence that the temperature at any place and the intensity of the poles are directly connected, and that the combination of the two phenomena is only a question of the power of induction. Dr. M. Hansteen. (Terrestrial Magnetism.) As the mean temperature at the surface of the earth is on the element of great importance in atmospheric physics, it has been strongly recommended to travellers and persons making distant voyages, if they are to remain only a few days at any place, that they should, on arriving, lose no time in burying in the earth, to the depth of three to twelve feet, according to the power of penetrating into the soil, bottles filled with water, or with spirits, if there should be any danger of water freezing. These bottles should be packed in boxes stuffed with woolen clothes, powdered charcoal, or some other non-conducting material, and should be allowed to remain underground till the time of departure, in order that they may acquire, as accurately as possible, the temperature of the ground. On being taken up, the temperature of the liquid should be ascertained by a good thermometer inserted in the bottle.

TEMPERATURE OF PLANTS. The living processes by which heat is so evidently developed in animals go on, though much less actively, in plants, and, as a particular temperature, independent of the air in which they live. The periods at which an increase in the temperature of plants has been most evidently observed are those of germination, flowering, and impregnation; but it is only when the plant is in the state which is more active during the performance of those functions that the heat becomes more evident. The great cause of the development of heat in animals is the union or combustion of carbon with oxygen, which is constantly taking place during the process of nutrition, in the various tissues of...
the animal body. The same thing occurs during the general growth of the plant: a certain quantity of carbon dioxide is given off in the course of respiration, which, coming in contact with oxygen in the tissues of the plant, unites with it, forms carbonic acid, and heat is developed.

That a development of heat took place during the growth of plants was proved by Hunter, who placed thermometer within the stems of several trees, and found that their temperature was always above that of the atmosphere. These experiments were followed up by Soland, Hermatił, and others, who confirmed the experiments of Hunter. But however surprising it may be that this increase of temperature depended on the sap which was pumped up from the soil; but this theory will not explain the phenomena of heat observed during the growth of plants, nor is it at all applicable to its occurrence during germination, which is an analogous process. Schuler, Neuffer, Nau, and Goepfert have conducted a variety of experiments on the temperature of plants. They found that in winter the parts that were not frozen had a higher temperature than the surrounding air; this was much more remarkable the case in spring; but in summer the temperature of the plant was mostly below that of the surrounding air. These experiments are in accordance with what we know to be the law of the development of plants in a more highly stratified atmosphere. In winter the vital processes of plants are slow or almost suspended; hence the small increase of temperature at that season. In the spring the process of growth is most rapid, and there is the greatest conversion of nutritive matter into new forms in the plant. Hence it is at this season that the year that the temperature of the plant is highest above the surrounding air; but in summer the heat of the air becomes greater, and the temperature of the plant is kept under that of the atmosphere by evaporation which is constantly going on from all parts of its surface.

In the development of heat during germination the changes that take place are more evident. The starch or mucilage surrounding the young plant is converted into sugar, and the latter is changed into water through the separation of carbon and oxygen in the form of carbonic acid, which, during their union, give out heat. A familiar instance of this process is seen in the increased heat of the growing barley previous to its being dried to form malt.

The increase of heat is more evident still in the flowering of plants, which, according to Dunal, results from the conversion of a certain portion of starch or mucilage in the disk and petals of the plant into sugar, for the nutrition of the young flowers. The increased heat of the flowers of plants during certain stages of their development was first observed by Madame Hubert in Madagascar, who, being blind, was the more dependent on the organ of touch; and in handling plants she found that the Affodilum was warmer than usual. This led Bory St. Vincent to pursue a series of experiments on this plant, in which he found a very high degree of heat developed during its flowering, which was sometimes 7° higher than the surrounding atmosphere. The flowers of the Arum tribe are very favourably constructed for the development and retention of heat; but all flowers, previous to the full development of their anthers and the function of impregnation, undergo these changes, which produce an increase of temperature.

(Meyer's Pflanzen Physiologie, band ii.; and Lindley's Introduction to Botany.)

TEMPERING OF STEEL. [Steel]

TEMPESTA, ANTONIO, a celebrated Italian battle and animal painter and engraver, was born at Florence in 1558. He became the scholar of John Strada or Stradanus, a Fleming, who was settled at Florence in the employ of the grand-duke, and who assisted him in the battles which he painted in the old ducal palace. Tempesta, after painting some years with Strada, whom he surpassed in every respect, visited Rome, and was employed by Gregory XIII., in the Vatican, where he painted, in small figures in fresco, the Translation of the Body of St. Gregory of Nazianzus. This subject was the most successful of his, and procured him constant occupation from the Roman nobility. He executed several good works for the Cardinal Azzai, Pincius. Pinta, at his villa at Caprarola, and some at Bassano for the Marques Guisalini. Tempesta resided chiefly at Rome, and died there in 1630, aged seventy-five. His reputation rests now almost entirely upon his etchings, although in his time he was known more as a painter. Lanzi terms him the first Italian who obtained distinction in landscape and animal painting, and considers him at this period to have been unrivalled in his own style in Italy; he was however surpassed afterwards by Correggio and Bassano, whose horses are far more perfect in the figures, and more successful in the foliage than Tempesta's; and he excelled in battles, processions, cavalades, hunts, and various field-sports. His designs, particularly his etchings, are remarkable for their spirit and boldness of conception, but they are at the same time composed in such a way as to produce a very beautiful effect. Tempesta painted generally small figures; in large ones he was not successful, and he seldom attempted them; he however occasionally prepared large cartoons for tapestries. In the style of the Grand Strada, Tempesta's chief work is a painting, besides those in the Vatican, and the Palazzo Vecchio, which are a Slaughter of the Innocents, in the Church of San Stefano Rotondo, at Rome; and two great cavalades and state-processions, executed for the Cardinal Scipione Borghese, in the loggia of his palace at Monte Cavallo (afterwards Palazzo Bentivoglio), who, according to his biographer and contemporary Baglione, was alone sufficient to have ensured him a lasting reputation if he had never painted anything else. One representation of his is one of the fairest and most finished compositions generally confused, and his light and dark disposed without taste; his most valuable designs are his hunts and field-sports, and his studies of horses. Of his other pieces the following are among the best and most celebrated:—

A set of 150 illustrations to the Old Testament, known as "Tempesta's Bible;" 16 large figures of Christ, the Virgin, and the Apostles; a very large plate of the Victory of the Jews over the Persians at Ctesiphon; an equestrian statue, with Abamalechis reporta, the composition of what is spirited, but very confused; the Life of St. Antony, 8 plates; 150 small plates from Ovid's "Metamorphoses" 13 of the Labours of Hercules; and 7 of the Seven Wonders of the World. Tempesta's designs are uniform and his engravings well executed. He has also engraved large plates for the following subjects—they are however executed to much in his own style to be faithful representations of the originals:—Castror and Pollius, and the horses on Monte Cavallo, and the equestrian statue of Marcus Aurelius, at the Capitol; Rome; the equestrian statue of Cosimo I. at John of Bologna, at Florence; that of Henry IV. at Paris, which was destroyed in 1792; and one of Henry II. of France. The statue however never existed, for a figure of Louis XIII. was placed upon the horse which was originally designed for a statue of Henry II., who was killed at a tournament. Tempesta's present place bears the following inscription: "Effigies equi secundum Dan. Henrici II. F. M. F. suis et maritis aequi, et Henri. II. Francae, reg. Henrici II. E. F. M. F. suae sui," in obitum in memoriam. A spirited design of the Battle of the Centaurs and the Lapithæ, by Tempesta, was cut in a large size in wooden and ivory Parabolé. As a man Tempesta appears, as it were, half retired from the world, and he has accomplished in every respect, and to have been naturally esteemed by his companions. There is a long list of the works of Tempesta in Heineken's "Dictionaire de l'Artiste," which are acquired by collectors, and are valued to the extent of 100 florins each. TEMPESTA, CAVALIERE, called also in Italy Peter Muiller or de Milletres. This artist, who is sometimes confused with Antonio Tempesta, was a native of Holland, although better known in Italy, and his name was Peter Molyn. Florillo says he was the first landscape-painter of the same name, and was born at Haar-
In 1637, he was called Tempesta through his skill in painting sea-storms and similar subjects, in which he was excellent, and in some respects rivalled Backhuyzen: he was also nearly equally excellent as an animal painter, especially of wild animals, for no one had thought that he remained in his own country and pursued entirely such subjects, he would have rivalled Rubens and Sniders in that department. There is yet another comparison to make respecting him; he rivalled, or perhaps surpassed, the great contemporary painter, Peter Muller, who by the name by which he is best known in Italy. As he grew old his powers of painting forsook him, and his means accordingly gradually diminished, and as he was too improvident to make any provision for his old age, his affairs became embarrassed. He died of a stroke in 1664, in a state of poverty when compared with his former influence. His pictures are numerous in the collections of the north of Italy: those which he painted during his imprisonment so generally accounted his best.

**TEMPLIO** (Sardbona.)

**TEMPLARS, KNIGHTS TEMPLARS, or KNIGHTS OF THE TEMPLE,** are the popular designations for the Brethren of the Temple of Solomon at Jerusalem, also called the Swordy of the Temple (Militia Templi) and the Soldiers of Christ. The three great religious military Orders, the Knights of the Hospital of St. John of Jerusalem (commonly called the Knights Hospitallers), the Templars, and the Teutonic Knights of St. Mary of Jerusalem (or the Teutonic Crusaders and their Grand Master, the Duke of Mayence) in the fourteenth century, constituted the military character which their order eventually assumed, or even the establishment of an order which should extend and perpetuate itself. Their original vow was simply to maintain free passage for the pilgrims who visit the Holy Land, and did not amount to as much as their number till six or seven years after their association. In another respect also their early condition and pretensions were remarkably contrasted with their subsequent state; they professed to have no sound of existence but the aim of the faithful. The king of Jerusalem, Baldwin II, gave them their first place of residence, a part of his palace; to which the abbot and canons of the church and convent of the Temple, which stood adjoining, added their houses to the sum of their arms, whence they acquired the name of Templars.

The new principle of their association, however, immediately drew general attention; so much so, that in 1120 the Hospitalers got their order remodelled by Pope Innocent II, and received a new and greater authority; the new principle of the Templars was by Honorius II., the successor of Calixtus, who in 1128 confirmed a rule for them which had been drawn up and decreed that same year by the Council of Troyes, on the requisition of Hugues de Payens and several of the brethren, who sent a mission to Europe for that purpose with strong recommendations from king Baldwin. Honorius at the same time, to distinguish them from the Hospitalers, who were arrayed in black mantle, assigned them the white mantle for their peculiar dress, which they wore plain till Eugenius III., in 1146, appointed them to wear a red cross on the left breast, in imitation of the white cross of the Hospitalers. These three orders, the Hospital, the Templar, and the Teutonic, became in time powerful political powers, the Temple being the most powerful.
cross worn by the Hospitaliers. This bloody cross was also borne upon their banner, which was formed of cloth striped black and white; whence it was called Bouscanti, an old French term applied to a horse marked with those colours. This word consequently became the famous war-cry of the Templar chivalry.

The new order speedily rose into consideration. Members of the noblest families in every nation of Christendom entered, and the power of donating in lands and money was showered upon it by persons of all ranks; and in course of time it acquired ample possessions in nearly every country of Europe. At the head of the order was the Grand Master, or Grand Magister, who was however not only elected by the Chapter, or general body of the Knights, but very much controlled by that body: the Grand-Master had immediately under him his Seneschal, or lieutenant; and other high officers were the Marshal, the Treasurer, &c.

The several countries in Asia and Europe in which the order had possessions were denominated Provinces; and each of them was presided over by a resident chief, called, indifferently, a Grand Prior, Grand Preceptor, or Provincial Master. Under the provincial masters were the Priors, otherwise called Bailiffs, or Masters, who had charge each of one of the districts into which the province was divided; and finally, under the priors were the Preceptors, each of whom presided over a single house, or chapter, consisting of two or three adjoining houses which were considered as one establishment, hence called a Preceptory.

The head province was that of Jerusalem; the affairs of the order, in fact, were for the most part directed by the chapter in that province, which was divided in constitution with all the powers of a general chapter at all times when such a chapter was not assembled. The grand-prior of Jerusalem was ex-officio treasurer of the order; and in this province the general master resided for many years, being the chief footing in the country: first in the city of Jerusalem, from the origin of the order till 1187, when Jerusalem was taken, and the kingdom founded by Godfrey of Bouillon put an end to, by Saladin; then in Antioch, residence of four provinces, till 1191; from 1191 till 1217; then at the newly-built fortress of the Pilgrims' Castle, situated on the sea-coast a few miles north of Cesarea, till the fall of Acre, and the final extinction of the Latin power in Palestine, in 1192. On this the Knights took refuge in the town of Limaso (otherwise called Limasol) in Cyprus. The other provinces in the east were Tripolis and Antioch; to which Cyprus, till then included in one of these, was added after that island became independent from the order. The western provinces were, Portugal, Castile and Leon, Aragon, France and Auvergne, Normandy, Aquitaine or Poitou, Provence, England (in which Scotland and Ireland were included), Germany, Upper and Central Italy, Apulia, and Sicily.

For a time the Templars and the Knights Hospitallers were ranked among the most powerful religious orders. The Templars consisted exclusively of laymen. But in the year 1162, the famous bull entitled 'Omne Datum Optimum,' issued by Pope Alexander III., among other important privileges which it bestowed upon the order, permitted it to receive as members any spiritual persons who were not bound by previous vows. These spiritual members were called Chaplains. They did not fight, nor take the military vow; but, in lieu of that duty, they not only cultivated other religious observances in the houses of the order, but usually acted also as secretaries to the chapter. They were not allowed to take any share in the government of the society unless specially invited by their superiors; but they were treated with much ceremonious respect, and they were frequently appointed preceptors.

Among the other privileges granted by the bull of 1162, was that of having the offices of religion celebrated once in the year in the houses of the order, even in countries lying under the jurisdiction of the Order, a permission well calculated to induce persons to join the society. It was asserted after it that the Templars' was insti- tution of the Templars from the effects of interdicts. Alexander's bull also allowed the order to have its own burial-ground in each of its houses, except only to the holy see; freed it from the payment of tithes, and even authorised it to receive them if the bishop gave his consent; and prohibited any one who had once become a Templar from ever leaving the order unless to enter into a stricter one.

At a date a little later the society still further extended its scheme and its influence, by admitting as members many persons who were not knights or of noble birth, but who were desirous of participating in the advantages of belonging to so powerful a body, on condition of acting as the squires and servants of the knights. These were styled Serving Brethren; and in this class were sometimes found individuals both of great wealth and eminent birth, whose contributions were of so large a magnitude as to enable the order to acquire an entire independence. The serving-brethren however could not be preceptors, or hold any of the higher offices in the order. Latterly, they were divided into two classes—those of arms and those of trades. The order, when it had thus increased to an immense number, considered with much more consideration than the others, as a body, of persons from whom they had been entitled to be present at meetings of the chapter, although it may be presumed that none of the serving-brethren either voted or took part in the deliberations. The order also associated to itself many persons under the name of Affiliated Members, who took no vows, assumed no peculiar dress, nor became subject to any duties or services; but, continuing to pursue their ordinary secular occupations, merely purchased enrolment or admission to the same, without any rights or duties, or any claim to the honour of the order. These were further admitted to the order by their parents or other relations; and also of persons of all ranks, both laity and clergy, who, without entering the order, pledged themselves to stand by and to maintain it right.

The history of the Knights and Templars would embrace the history of the wars of the Christians against the Infidels in the East for all the time they lasted after the establishment of the order. For more than a hundred and seventy years it was the chief object of their orders to maintain a portion of the Christian troops, and almost every encounter with the enemy bore testimony to their unequalled prowess and daring. But it may nevertheless be questioned whether the establishment of this and the other religious military orders put an end to the attempt so perseveringly made to wrest the Holy Land from the dominion of the Infidels. The Templars and Hospitaliers probably damaged and weakened the cause for which they fought, much by their rivalry, jealousy, and frequent open contrivances, than by anything that they did it by their valour. On some occasions this opposition between the two orders rose so high as not only to make them desert or withhold assistance from each other in the field of battle, but even to break up the army into two or more bodies, and to prevent a concert of operations against the common enemy. No charity (though such charges have been brought) can be substi- tuted against the bravery of either; but they can hardly be acquitted of treachery in some instances to one another, and the most scandalous abandonment of their duties to the public cause. Then, the immense wealth and worldly power which the Templars in particular speedily acquired altogether changed the original character and spirit of their institution long before it was half a century old. Within thirty or forty years from the time of its establishment, two at least of the four vows which the members still continued to take had become a mockery and a farce; instead of poverty and chastity, they were already distinguished by their pompous pride, and the general luxury and licentiousness of their lives. But the vast influence the forces of the association, the extent to which it had extended its ramifications in all directions, and its other elements of strength, might have long withstood the principal body of the association. But in the year 1127, the age of seventeen, was the enemy of the church by education, by temper, and by circumstances. He had already proceeded to extremities in a quarrel with Pope Boniface VIII., which was terminated only with the loss of that
postiff. His successor, Benedict XI., is supposed to have been poisoned at the instigation of Philip. Benedict was succeeded by Clement V., who is believed to have purchased his elevation from Philip on condition, among other compliances, of co-operating with him in the destruction of the Templars. This was in 1305. Obnoxious already as the natural allies and defenders of the Holy See, and tempting the attack of the needy and unscrupulous king by their immense possessions, these knights are also said to have further irritated Philip about this time by their suspected share in exciting an insurrection of the Parisians against a debasement of the coinage, a practice which he repeated so often in the course of his reign, that he acquired for himself the name of the money-lender (le faux-monnaieur).

In 1306 Jacques de Molay, the master of the Temple, was drawn to Europe by a summons from the pope, who professed a desire to consult with him on the expediency of a union of the two orders of the Templars and the Hospitallers. The following year, while Molay was at Paris, the first distinct accusations against the Templars were made by two individuals lying in prison under sentence of death; Squin de Flenian, who had formerly been a member of the order and prior of Montaupcon, but had been ejected for heresy and other offences, and a Florentine called Noffo Dei, also, according to one account, a degraded Templar, by general admission a person of the worst character. They made their revelations to Philip himself, and were immediately liberated from prison. Their charges, imputing to the order the systematic practice and encouragement of all sorts of secret immoralities, as well as the strangest confusion of heresy, sodomy, and infidelity, are far too absurd for examination. Very soon after this, on the 12th of September, 1307, royal letters were issued sealed to all the governors of towns and other officers of the crown in authority throughout the kingdom, and transmitted along with orders to them to arm themselves and the persons under their command on that day month and then to open the letters in the night and obtained of the crimes laid to the charge of the order, or any at least that were not manifestly and undeniably unworthy of all regard. Even the Paris commission however did not satisfy the impatience of Philip; on its requisition a great number of knights had stood forward to defend the order, among whom were several of those who had confessed and afterwards retracted. Philip, having forced the pope to nominate Philip de Marigny, bishop of Cambrai, the brother of Enguerrand de Marigny, his rector, minister, to the archbishopric of Sens, which had just become vacant, and then included the diocese of Paris, got the new archbishop to convok his provincial council in the capital, at the last in May, the 10th of May, 1310; and this body, on the Wednesday morning following, had fixed for the hour of the defenders of the order, who had already made confession, brought out as 'relapsed heretics' to a field behind the abbey of St. Antoine, and there committed to the flames. They all died asserting their innocence, and that of the order. This terrible example was speedily imitated in the province of Rheims and elsewhere; and some months after, the archbishop of Sens held himself another council, and burned four more knights. These proceedings put a stop to the attempts at defending the order: the rest of the knights who had undertaken this task now all declared their renunciation of it. Meanwhile a general council had been appointed by Clement to meet at Vienna, in October, 1311. It assembled on the 13th of that month, but it was not found so considerable a body as Philip and the pope had expected; and Clement, having put an end to the session, assembled the cardinals and a few other prelates upon whom he could depend in a secret consistory, and took the opinion for the next day at theordinary assembled, pursuant to the adjournment, on the 3rd of April. Philip was seated on Clement's right hand, accompanied by his brother and his sons, and attended by an imposing military force; and the business read the bull of abolition, the council listening in silence. It was formally published on the 2nd of May following. On the 18th of the same month, Molay, the grand-master, and Guy, commissary or grand-prior of Normandy, who had all three remained in prison at Paris, were brought before the archbishop of Sens, condemned to death, and burned on the small islands in the Seine, about the spot where the statue of Henry IV. is now erected on the Pont Neuf.

In all, Clement and Philip, the former of whom died only about a month, and the latter, of a fall from his horse, within a year after the martyrdom of De Molay, were to secure to themselves only a small portion of the lands which they had probably hoped for. The king ceased and kept, or divided with his confederate, moveable property of the Templars in that country; here, and also in England, and throughout the rest of Europe, with the exception of Spain and Portugal, it was necessary to transfer their landed possessions to the Cathedral, or Knights of St. John (at this time commonly called the Knights of Rhodes). In Spain the lands of the Templars were bestowed upon the Knights of Our Lady of Montesa, a new order, founded in 1317; and in Italy the society merely took the new name of the Knights of Christ, which still subsists. It is affirmed that in France the order of the Templars has survived to our own day; and it is certain that a society calling itself by that name exists in Paris, which professes to be in possession of the original register and records of the ancient order, and to have been governed by an unbroken succession of grand-masters, many of them of illustrious descent since the time of Jacques de Molay. It pretends to be the supreme chapter of the order. In England we believe also in Germany, the Freemasons are in the habit of holding themselves up as a sort of representatives of the ancient Templars, as asserted by Matthew Paris, that about the year 1244 nanoms or estates in possession of the Templars through-christendom already amounted to 8000; and it has been calculated that the entire revenues of the order when dissolved did not fall short of six millions sterling, gh; it seems impossible that this should not be a great geration. Their possessions in England particularly even at a comparatively early period of great extent, as may be seen from an 'inquisition' or account...
of their lands, taken by royal authority in the year 1185, which Duvalde has printed in his "Monasticon" (vol. vii. pl. ii., pp. 815, &c., edition of 1830). They are supposed to have been settled in the Old Temple, at London, which stood on the south side of Holborn, near the present St. Paul's Cathedral, by the beginning of the reign of Stephen; they removed to their new house at the western extremity of Fleet Street, the site of which still retains the name of the Temple, in 1185. This was the chief seat of the order in England.

The question of the guilt or innocence of the Templars has been much discussed in modern times; and although it may be said to be now almost universally admitted that the particular charges upon which they were condemned were for the most part entirely unfounded, some attempts have been made to show the probability that the order nevertheless was held together by certain secret principles or doctrines which made its existence dangerous to society and called for its suppression. Von Hammer, for instance, in his "Geschichte der Amaisinen," (or "History of the Amaisins"), of which there is an English translation by Dr. G. C. Wood, has endeavoured to establish a similarity and connection between the order of the Templars and the strange association, and in a dissertation, printed in the sixth volume of his "Mines de l'Orient," the same writer has attempted to convict the order of a participation in the apostasy, idolatry, and impiety of the Gnostics and Orphianites. Von Hammer's essay has been answered by M. Raynouard, in an article printed in the fifth volume of Michaud's "Histoire des Croisades," p. 572, &c.; and also in two articles in the "Journal des Savans" for March and April, 1819; and in two others, published in the Bibliothèque Universelle," tom. x., p. 327, and tom. x., p. 3. The documents relating to the condemnation of the Templars were first published in a work entitled "Traitez concernant la Condamnation des Templiers," by M. Du Puy, 8vo., Paris, 1654; reprinted, with additions, under the title of "Histoire de la Condamnation des Templiers," &c., by Pierre Du Puy, 2 vols. 8vo., Bruxelles, 1713; and under that of "Histoire de l'Ordre Militaire des Templiers, avec les Pièces Justificatives," 4to., Bruxelles, 1731. Other works on the subject are—Nicolas Guilleri, "Historia Templariorum," 8vo., Amsterdam, 1691, and, with large additions, 1703; Christiani Thomasii, "Disertatio de Templariorum Equitum Ordine Sublato," 4to., Italia, 1706; Raynouard, "Monumens Historiques relatifs à la Condamnation des Templiers," 8vo., Paris, 1813; Voilier, "Essai sur l'histoire des Maçons et des Templiers des Nations," chap. 66; Munster, "Statutenbuch des Ordens der Tempelherren," Willke, "Geschichte des Tempelherrenordens," "Secret Societies of the Middle Ages" (in the "Library of Entertainments for Knowledge"), 12mo., Lond., 1837; and "The History of the Knights Temple, the Temple Church, and the Temple," by C. G. Addison, 4to., Lond., 1842. See also Tanner's "Notitia Monastica," fol., Lond., 1744, pp. 407-410, for numerous references to printed books and MSS. connected with the English Templars.

TEMPLE. (The Latin Templum). What is known of the architecture of the nations of antiquity is derived chiefly from their temples; for of all their public edifices those devoted to religion are the most numerous, if we except perhaps those of the Romans, the remains of whose thermes, aqueducts, theatres, amphitheatres, and other monuments of that class are as common as their temples, and have been as well preserved. Nearly all of which may, more or less, be termed the columnar architecture of the antients—Egyptian, Greek, and Roman—is seen in their temples. In those of the Egyptians, it may be said to display itself exclusively, and likewise much more extensively than in the temples of the other two, with this further difference, that regards the general design and character, viz., that in the Egyptian edifices the columns are placed internally, that is, so as to form colonnades along the sides of an enclosed fore-court, and the portico, or frontispiece of the temple itself. Of this disposition of the edifice, with a walled-in portico or colonnade, an example is shown in Egyptian Architecture (p. 316), where other particulars relative to Egyptian temples and some of the characteristic differences between them and those of the Greeks are mentioned. Instead of being composed of a variety of parts grouped and combined together, these latter consist only of a simple parallelogram, a cella, or body of the temple itself, either in antis, or else peripeteial, that is, entirely surrounded with an external colonnade; for to these two distinctions may be reduced those subordinate ones for which separate technical terms have been invented, yet they do not at all affect the general shape and outline, which still remains a simple mass, either with or without external colonnades along its sides.

An explanation of those terms having been given in Civil Architecture, page 221, col. 1, we refer to what is there said for the respective definitions, and instead of repeating them, now introduce here what will render them more intelligible, and be of assistance in the present article, viz. examples of the different forms of plan as regards colonnament, or the arrangement of the columns.

Though so exceedingly small as to show little more than the position of the columns, without any regard to exactness in other respects, these slight diagrams will both help to render evident many circumstances that cannot be fully explained, and also to exemplify the various denominations of temples and porticoes according to the number of columns in front. The one in antis is a distyle in antis, there being only two columns between the antis, or three intercolumnia, as in the two tetraconta examples (prostyle and amphi prostyle); whereas a temple there four columns between the antis, it would become tetrastyle in antis, and have as many intercolumnia as in hexastyle, of which the last peripheral is an example. The dipteral and pseudo-dipteral are specimens; and the hypaethral a decastyle. This last may also be taken as an example (though an imperfect one) of a dekastyle, for it will be seen that if the portico were a semi broken parallelism, it could project two intercolumnia from the body of the temple. In this figure the pronaoe may also be termed polystyle, on account of the great number of columns in successive rows between the side walls enclosing that part of the plan (pronaoe), which may be described as being on the style of a distyle in antis behind it, and a diastyle decastyle in front of it. *

* Though such is the case in the plan given above as an example of a hypaethral, it must not therefore be supposed either that all dekastyle temples were hypaethral, or all hypaethral ones decastyle; neither, again, is a dekastyle case but deep polystyle pronaoe filled with sides of columns inserted on the lines of those in front.
portions, nothing of combination or of design, as the last term is usually understood; but the difference of effect depended altogether upon the actual dimensions of the structures, upon material and execution, upon circumstances of detail and finish, and on the diverse and particular kind of decoration in regard to sculpture and polychromic embellishment. The only instance of combination and grouping is that afforded by the Erechtheum, or triple temple on the Acropolis at Athens, which has two distinct and entirely any examples in Greek art. At its east end, and a tetrastylic portico of the same order on its north side, and upon a lower level; besides which there is a smaller attached or projecting structure at the south-west angle, forming a tetrastylic portico arrangement, the porticoes being either in antis, so as to be recessed within the main walls forming the sides of the edifice; or are only the ends or ends of the colonnades continued throughout the whole exterior; consequently in neither case does such a portico project over the other. The other known examples of Greek porticoes are the two small Ionic temples at Athens, that on the banks of the Ilissus, called the temple of Panops; and that dedicated to Apollo, on the spot where the Acropolis itself; nor are either of them in a line with the Propylæa, or equidistant from such line or axis. (Parthenon—Plan.)

This attention to uniformity of arrangement, where different buildings are brought together on one general plan, is another instance of the difference of taste in respect to the Egyptians and the Greeks. The temples of the Egyptians consist of various architectural parts subordinate to the principal structure, but combining with that and with each other, to form a whole; while with the Greeks something further extended by an architectural avenue of sphæras in front of the buildings. The Greeks, on the contrary, certainly did not imitate or rival the Egyptians in the extent and complex arrangement of the secondary structures; but there can be little doubt that they were chiefly Roman works, viz. the temples at Baalbec and Palmyra. Similarly enclosed and standing in the centre of a peribolus or piazza (therefore very different in plan from an Egyptian temple preceded by a fore-courts, the temple of Juno at Rome (Roman Architecture, p. 74); that of Jupiter Olympius at Athens, a work completed in the time of Hadrian; and also, among Greek-Asiatic examples, the temples of Minerva Polias at Priene, and Apollo Didymæus at Miletus.

Similar is it upon the whole to that of the Greeks, the temple-architecture of the Romans differs from it in many other circumstances besides those of style; which latter distinction, Corinthian, or having no other various style of the Romans, as the Doric was of Greece and its Italian colonies. One leading distinction in regard to general arrangement is, that Roman plans were hardly ever in antis, and not often peripteral, but generally prostyle, with porticos projecting from the cella, or not, and the structure, three or more intercolumnies, so as to be tripere style, &c. (Porroco.) Such façade was generally further distinguished by having a flight of steps enclosed within pilasters at its extremities, the actual portico being either amphiprostyle, and not in antis, consequently had a projecting portico at each end; and in both the porticoes were tetrastyl. Of the former nothing now remains, but it is well known from Stuart's delineations, and the order of the Greeks, although decidedly inferior to them in beauty of detail and finish of execution; except perhaps in one or two particular examples of that order which, although called Corinthian, is so peculiarly their own, that Roman would be the more correct name for it. In order to give the temple a greater dignity to the temple, as it stands, they elevated it upon a mere basement or substructure with an ascent in front or at both ends, and upon a spreading-out platform, at every side. There were some, that occasionally formed a succession of terraces of flights of steps, leading up to if not continued on every side of the building. The celebrated Temple of Fortune at Prænestæ, usually supposed to have been originally founded by Sulla, was a very remarkable example of the kind. Very little now remains of it, except the terraces themselves; neither have we any account of the architecture, but besides the principal edifice or temple there were several subordinate ones, on the different platforms. 'I know of no other temple,' says Woods, in the 'Letters of an Architect,' 'either of ancient or modern times, where so great a number of edifices, and occupying so great an extent, were combined into one regular and symmetrical plan; and our elevation is still higher when we consider that it was not necessary not to erect the building, but absolutely to build a place to it to stand on.'

Circular plans for temples are peculiar to the Romans, and occasion a diversity of character not to be met with in the case of the Greeks. Besides the two simplest forms, the monopteral and peripteral, which have been shown above, there were other varieties and combinations. For a notice of some of them we refer to Roman Architecture (p. 75).

Instead of entering into formal descriptions of particular temples, we subjoin a synopsis with accompanying remarks. Some of the measurements and other particular statements in it may not exactly accord with other accounts of the same structures; but the discrepancy between different authorities, whether writers or delineators and restorers, that it is impossible to obtain complete accuracy.
<table>
<thead>
<tr>
<th>Location</th>
<th>Temple</th>
<th>Style</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Athens</td>
<td>Theseion Parthenon</td>
<td>Doric</td>
<td>Hexastyle, peristyle, with 12 intercolonnes on sides, 46 x 105 feet; Octastyle, peristyle, hypaethral, 100 x 229 feet; Iletinus and Calcrates, architects. (Parthenon.)</td>
</tr>
<tr>
<td></td>
<td>Propylaea</td>
<td>Doric</td>
<td>Hexastyle on both fronts, with wings of a smaller order, at right angles to west front. (Parthenon—Plan.) Mnesicles, architect, 437-432 B.C.</td>
</tr>
<tr>
<td></td>
<td>Erechtheion</td>
<td>Ionic</td>
<td>Hexastyle, protyle at end, with a tetraestyle, diproryl style north side.</td>
</tr>
<tr>
<td></td>
<td>Panops</td>
<td>Ionic</td>
<td>Tetraestyle, amphiproryl. A well-known example, though no longer extant, having been destroyed by the Turks since Sturz time.</td>
</tr>
<tr>
<td></td>
<td>Nike Apteros Jupiter Olympius</td>
<td>Corinthian</td>
<td>Decastyle, peristyle, columns 60 feet high, 96 x 259 feet. Entered by a peribolus. A Roman work originally begun in the time of Flamininus, continued by Antiochus Epiphanes, and completed by Hadrian.</td>
</tr>
<tr>
<td>Eleusis</td>
<td>Ceros</td>
<td>Doric</td>
<td>A square building of about 180 feet on each side, with a dorastyle colonnade forming the west front. This temple begun by Iletinus; colonnade added by Philon, architect, about 315 B.C.</td>
</tr>
<tr>
<td>Thoricus</td>
<td>Nemesis</td>
<td>Doric</td>
<td>Hexastyle on both fronts, with inner order as at Athens 50 x 60 feet. A second and smaller peribolus with a peribolus, distyle in antis. See 'Unedited Antiquities of Athens.' None of these buildings now remain.</td>
</tr>
<tr>
<td>Rhamnus</td>
<td>Themis, or lesser Temp. of Nemesis</td>
<td>Doric</td>
<td>Epistyle, peristyle, or with seven columns at each end, and thirteen on each side. No cells remaining; but supposed to have been a double temple, with a passage through the center on the sides, dividing the cells into two.</td>
</tr>
<tr>
<td>Ægina</td>
<td>Jupiter Panhellenius</td>
<td>Doric</td>
<td>Hexastyle, peristyle, 11 intercolonnes on sides, 33 x 70 feet. Distyle in antis.</td>
</tr>
<tr>
<td>Olympia</td>
<td>Jupiter Olympius</td>
<td>Doric</td>
<td>Hexastyle, peristyle, hypaethral, 41 x 90 feet. This structure celebrated for its polychromy and sculpture (the Agisthenus Nympha).</td>
</tr>
<tr>
<td>Tegea</td>
<td>Athene Alea</td>
<td>Ionic</td>
<td>Hexastyle, peristyle.</td>
</tr>
<tr>
<td>Nemea</td>
<td>Jupiter</td>
<td>Doric</td>
<td>Hexastyle, peristyle.</td>
</tr>
</tbody>
</table>

**Magnae-Grecia and Sicily.**

<table>
<thead>
<tr>
<th>Place</th>
<th>Temple</th>
<th>Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pastum</td>
<td>Neptune Ceres</td>
<td>Doric</td>
<td>Hexastyle, peristyle, hypaethral, 79 x 119 feet.</td>
</tr>
<tr>
<td>Agrigentum</td>
<td>Jupiter Olympius</td>
<td>Doric</td>
<td>Hexastyle, peristyle, 47 x 107 feet. (Pastum Architect.) Apical, or with engaged columns, epistyle, 182 x 369 feet. (For description, see Agrigentum.) Wilkins, in his remarks of it, makes this temple hexastyle amphiapostyle.</td>
</tr>
<tr>
<td></td>
<td>Juno Lucina Concord</td>
<td>Doric</td>
<td>Hexastyle peristyle, 57 x 124 feet.</td>
</tr>
<tr>
<td>Segesta</td>
<td>Great Temple</td>
<td>Doric</td>
<td>Hexastyle, peristyle, 76 x 190 feet. All the external columns, excepted, standing, but no remains of cells.</td>
</tr>
<tr>
<td>Selinus</td>
<td></td>
<td>Octastyle, dipṭyle, 160 x 330 feet. There are remains of two other temples, two of which appear to have been hexastyle peristyle.</td>
<td></td>
</tr>
<tr>
<td>Syracuse</td>
<td>Minerva Polias</td>
<td>Doric</td>
<td>Hexastyle, 13 intercolonnes on sides; now converted into a church with a modern Italian Corinthian façade.</td>
</tr>
</tbody>
</table>

**Asiatic Greek.**

<table>
<thead>
<tr>
<th>Location</th>
<th>Temple</th>
<th>Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ephesus</td>
<td>Diana</td>
<td>Ionic</td>
<td>Decastyle, dipṭyle, hypaethral; columns 60 feet high; one of the largest Grecian temples, being 220 x 425 feet. Ctesipha and Dætagenes, architects. Date about 340 B.C.</td>
</tr>
<tr>
<td>Priene</td>
<td></td>
<td>Ionic</td>
<td>Hexastyle, peristyle, 64 x 116 feet. Pytho, architect, about 150 B.C. The order the best example of Asiatic Ionic. This temple had a peribolus and propyläum; the latter tetraestyle, with two rows of square pillars within.</td>
</tr>
</tbody>
</table>
The above table might be rendered more copious and greatly extended; and it might also have been differently arranged in several ways, each of which would have had something to recommend it, according to the purpose for which it may happen to be consulted. Chronological order, for instance, if the respective dates could be ascertained with tolerable accuracy, may be considered preferable by some persons; or the buildings might have been classified according to the number of columns in front, and as being in antica, prostyle, peripteral, &c.; or else according to their relative size and dimensions. In fact a separate table is required for each mode of classification and arrangement; but as that could not be done, we have adopted what we consider the most satisfactory upon the whole. We may however render it in some measure more complete by here pointing out that the deacostyle examples mentioned in it are the Temple of Jupiter, Athens; Diana, Ephesus; Apollo, Mileitus; Juno, Samos; Venus and Roma, Rome; and the great temple at Baalbec. As regards dimensions and relative size, the following are the largest structures, viz.:

**Temple of Zeus at Olympia.** For 447 years after the Hebrews had entered the land of Canaan they continued to worship at the tabernacle which had been framed for their use in the Wilderness. The incongruity of a settled people having only a tent for the celebration of their splendid ritual service first occurred to the mind of David. It appeared unworthy to him that the Ark of God should still 'dwell between curtains,' while he abode himself in a 'house of cedar,' and he therefore proposed to build a temple in which the worship of God might be more becomingly conducted (1 Chron., xvii.). The prophet Nathan was however commissioned to inform him that having been engaged in constant warfare, and shed much human blood, he could not be allowed to execute the design he had formed, which was to be reserved for the peaceful reign of his son Solomon. This undertaking was however a principal subject of David's thought and care during the remainder of his reign; and to it he appropriated a large proportion of the immense treasure which his many victories produced. He may be said to have provided all, or nearly all, the materials before his death; consisting of large but variously estimated quantities of gold and silver, brass and iron, stone and timber. He also secured the services of skillful mechanics and artisans for every branch of the work, and furnished the design, plan, and site of the building; so that none of the credit of this work seems due to David than to Solomon (1 Chron. xxii.; xxiii.; xxviii. 11-19). The foundation of the Temple was laid in a.c. 1012, being the fourth year of Solomon's reign; and in seven years and a half it was completed. During this time 183,000 persons were employed on the work. Of Jews there were 30,000 serving by rotation of 10,000 monthly; and of Canaanites there were 153,000, of whom 70,000 were labourers, 80,000 hewers of wood and stone, and
And 20 hammers, together, materials such collected embody treasures, wall, cases in Phoenician up given considered overlooked.

Moriah, similar to the Jewish architectural never realized in this degree a temple conceived of by Herod of the temple of Jerusalem and the temple of God in Hebron.

The top of the hill was levelled, and the site selected could afford a sufficient area. This area was divided into two (but in Herod's temple three) courts, in the outermost of which stood the people. It was separated by a low wall (or, as some think, by a lattice fence or trellis) from the inner court, called the Court of the Priests, in which the great altar of burnt offerings, and where the priests and Levites officiated in view of the people, and in front of the holy house, or proper temple. The proper temple, as previously indicated, was an oblong building. It was 70 cubits long in the first, 10 cubits in the width from the north to the south, and 20 cubits from the west to the east.

The holiest part of the temple, occupied the same relative position as in the tabernacle but some of them were larger, as the altar, candlestick &c., in proportion to the more extensive establishments which they belonged. The principal of the new altar was jachin, which rested upon the back of twelve oxen of the same metal.

The inner sanctuary was separated from the holy place by a rich curtained veil. The whole of the interior was lavishly adorned with figures of palm-trees, and flowers, and then overlaid with the finest gold. The doors were also covered with gold; the utensils in the house were of that metal; even the floor appears to have been overlaid with it (1 Kings vi. 30). Of this lavish expense the builders, priests, and people who officiated upon the building, and the elaborate workmanship bestowed upon it, which, rather than its architectural features, accounts for the reports of its surpassing magnificence, and for the immense wealth consumed in its erection.

The temple was an edifice based rather upon the exaggerated statements of Josephus than upon the more sober accounts in Scripture. does not, as in other nations, the temple of the whole nation, and in the production of which the whole nation could therefore concentrate its resources.

The Temple of Solomon retained its pristine splendor only for forty years, when its treasures were plundered by Shishak, king of Egypt. After undergoing various alterations and partial destruction by the Chaldeans under Nebuchadrezzar, aec. 586, it having stood 417 years. After the Captivity, the temple was rebuilt, on the same plan, and on a more extensive scale, but with greatly diminished splendor. The temple stood in a constant state of repair, and was resanctified by the new temple after the exile, the work of the men of garrison the people of the temple.

The site of Solomon's Temple was the summit of Mount Moriah, on which was the city of Jerusalem founded. This eminence rose to no great height within the city, but was high and steep above the valley of the Kidron, which it overlooked. It faced the Mount of Olives. The Mosque of Omar now occupies the same site; and the imposing figure which it makes in every view of Jerusalem shows that a more advantageous situation could not have been otherwise.

All the pillars and bases were of unhewn stones; others were of marble or alabaster. The twelve massive columns of black marble are entered by a series of chambers, from which, by means of rolls of tapestry, the people were conducted to the temple. The columns were 18 cubits high, and 10 cubits in circumference; and the holy place was 40 cubits long by 20 wide; and the sanctuary was a perfect square of 20 cubits. The building fronted the east. Along the north and south sides, at the east, the west end of the structure, were attached certain buildings. These buildings, which were 120 cubits high, or four times the height of the temple, are not mentioned in the lists of Solomon's treasures, but are conjectured to have been the treasury, and the houses of the priests, Levites, and other servants of the temple; and also the houses of the king and his courtiers, which must have been of more importance.

A.D. 64, nothing remained to be done, and the disposal of the treasure of the Temple, and the erection of additional buildings (John vi. 20), is
ence of 18,000 workmen excited some alarm for the part they might take in the troubles which had already commenced, and which, a few years after, brought upon the nation the imperial yoke under Versailles and Titus, and involved the temple and city of Jerusalem in one
common ruin, A.D. 70.

TEMPLE, SIR WILLIAM, an eminent statesman, diplomatist, and orator, was born in London, in the year 1629, and was the eldest son of Sir John Temple, who was Master of the Rolls in Ireland, and author of a History of the Irish Rebellion which began in 1641. He was educated first by his uncle, Dr. Henry Hammond, afterwards Sir Henry Hammond, about peace and war, and then afterwards, on his uncle's being turned out of his living by the parliament, sent to a school at Bishop-Stortford, and, at the age of seventeen, to Emmanuel College, Cambridge, where the celebrated Cudworth was his tutor. He is said by his sister, Lady Giffard, who wrote a memoir of him, to have passed a gay idle life at Cambridge, and, after having been there about two years, he went away without a degree. He then went abroad, and having spent two years in France, and visited Holland, Flanders, and Germany, he returned to England marked by the French and Spanish languages. As he was about to start on his travels, he met, in the Isle of Wight, the young lady to whom, after many delays and difficulties, arising out of want of fortune and interest, he had formed a passion without her knowing it, and which was always to be united. She was the daughter of Sir Peter Osborne, a devoted adherent of Charles I., and a great sufferer by his devotion: letters of her which are preserved show her to have been a very superior woman: she remained faithful to him after he was dismissed from office, bearing his great discouragements, and at last, after the death of her father, and after six years' waiting, they were married in 1654. It appears that, among many offers which she rejected for Temple, was one from Henry Cromwell. Temple was trained in love, though his father was poor, independently ofhis appointment as Master of the Rolls in Ireland, and when deprived of this for some years during the civil wars, was exceedingly hampered in his finances. Sir John Temple was restored to this appointment as a vote of thanks to his son, after his marriage, with him in Ireland. Under his father's roof in Dublin, or in a country-seat in the county of Carlow, Temple passed five years, which were divided between literary pursuits and country business, and while the two worked together, had the birth and death of five children. In 1660 Temple was chosen, without solicitation or even previous knowledge, member of the Irish convention of that year for the county of Carlow. He was appointed the same year ambassador to the United Provinces, and in 1662 arrived at The Hague, as envoy and plenipotentiary for this purpose, when the Spanish ambassador in London received full power to negotiate there, and in three days the treaty of Westminster was concluded. Temple was now offered a seat at his Majesty's council, but he declined it. He was very soon after appointed again to the Hague, as ambassador extraordinary, and the next year ambassador to the congress at Nimeguen. The peace of Nimeguen, concluded in the beginning of 1671, ill carried with it the peace of the world, and the states of the United Provinces, and little by little they broke up, and he was glad to avail himself of a point of form for the purpose of withholding his signature to the treaty. Temple now returned to England to receive an offer of the post of secretary of state, which he refused. He was much consulted by the king, who had just lost the services of Lord Danby; and in the ministerial difficulties which followed upon Danby's impeachment and commitment, Temple did not take a very active part in them. He was now made ambassador at Madrid, but which never came to pass, and subsequently to bring about peace with the United Provinces and with France. This last object was accomplished in July, 1667, by the treaty of Breda, which however Temple had no part in negotiating, and the mode of bringing about which he had not altogether approved of. In 1668 Temple's services had been rewarded, without any solicitation on his part, by a barony.

In the close of the year 1667 Temple received orders from Arlington to repair to the Hague, to negotiate a treaty against France, and for the protection of the Spanish Netherlands (the power of the United Provinces being considerably diminished by the state of affairs), and address the celebrated Triple Alliance was concluded on the 23rd of January, 1668. England, Holland, and Sweden bound themselves by this alliance to bring about a treaty between France and England, and of course France from entering the Low Countries. Temple had thus achieved an object which he had had at heart, even before the treaty of Breda, so favourable to French views, a blow to the ambition of Louis XIV. The successful conclusion of this treat, established Temple's diplomatic fame, and was of the first importance to England and Europe.

Temple was next appointed ambassador at Aix, where the negotiations for peace between France and Spain, in pursuance of the Triple Alliance, were to be carried on. On the conclusion of the peace of Aix, he was appointed ambassador at the Hague. Here he continued, carrying out the policy of the Triple Alliance, till September, 1670, when he was called home, having been employed there in the councils of Charles II., and the celebrated secret treaty having been made with France, Temple was ordered home, found himself on his arrival in England no longer in the confidence of Arlington, and in the summer of 1671 was dismissed, though there was no reason at all for his dismissal having been made by condition by the French government. (Temple's Works, ii., 176.) He now retired to Sheen, and meditated never again returning to public life, saying that 'he had been long enough in courts and public offices, and never did any good or harm, and found that they were not made for one another.'

During this retirement Temple devoted himself to gardening, the improvement of his house at Sheen, and literature, and published several of the works on which his reputation has been rests, and composed a memoir of the life of John Temple, as written by himself, which was published under the title of 'Memoirs of John Temple,' published in 1672. Temple was summoned however from his literary retirement in the summer of 1674, to conclude the second Dutch war, and he obeyed the summons. He was sent over to consult for the Hague, as envoy and plenipotentiary for this purpose, when the Spanish ambassador in London received full power to negotiate there, and in three days the treaty of Westminster was concluded. Temple was now offered a seat at his Majesty's council, but he refused. He was very soon after appointed again to the Hague, as ambassador extraordinary, and the next year ambassador to the congress at Nimeguen. The peace of Nimeguen, concluded in the beginning of 1671, ill carried with it the peace of the world, and the states of the United Provinces, and little by little they broke up, and he was glad to avail himself of a point of form for the purpose of withholding his signature to the treaty. Temple now returned to England to receive an offer of the post of secretary of state, which he refused. He was much consulted by the king, who had just lost the services of Lord Danby; and in the ministerial difficulties which followed upon Danby's impeachment and commitment, Temple did not take a very active part in them. He was now made ambassador at Madrid, but which never came to pass, and subsequently to bring about peace with the United Provinces and with France. This last object was accompl
description, by Sir James Mackintosh, of his character as diplomatist and statesman. 'He was a most admirable person. He seems to be the model of a negotiator, uniting politeness and address to honesty. His merit as a domestic politician is also very great; in an age of extremes he was attached to liberty, and yet, as much as might have been expected, he was not indifferent to the wants of his country.' (Life of Mackintosh, ii. 193.)

Dr. Johnson, speaking of Sir William Temple as a writer, has said that 'he was the first writer who gave candour to English prose.'

There are two or three biographies of Temple; one by Abel Boyer, published about fourteen years after his death, and another by his sister, Lady Giffard, prefixed to the edition of his works, &c., of four volumes, folio, 1735.

TENACITY (from the Latin 'tenacitas,' 'the power of holding'), a property of material bodies by which their parts resist an effort to force them asunder.

This property is a result of the corpuscular forces acting with mutual repulsions upon the particles constituting the bodies of particles: it is consequently different in different materials, and in the same material it varies with the state of the body with respect to temperature and other circumstances.

Those corpuscular forces consist of attractions which vary according to unknown laws with the distances of the particles from one another, and even at certain distances they become repulsions; but, in all bodies except the elastic, they are combined in such a manner as to produce that coherence which constitutes the tenacity of the masses. In those fluids the particles have no coherence, and when the pressures to which they are subject are removed, those particles immediately separate from each other, and the fluid consists, as it were, of all the particles, which, acting separately, up to a certain quantity of calor, with which they are combined. In non-elastic fluids and in solids, tenacity exists, but in very different degrees; its force depending upon differences in the intensity of the attracting powers between the particles, upon differences in the distances of the particles themselves, upon the action of the calorie, and, in some cases, upon variations in the pressure of the atmosphere.

The molecules of liquids adhere to one another, and generally to those of solid bodies, by attractive forces which decrease rapidly; and, at sensible distances from the supposed places of contact, the adhesion entirely disappears (CAPILLARY ATTRACTION): the real tenacity of the molecules being, as Dr. Young observes, equal to the cohesion of the solid; this is, in fact, the force of repulsion arising from the actions of the corpuscles.

It is on account of the small distance to which the attractions of the fluid molecules extend, and to the freedom with which the particles move one on another, that fluids appear to have so little tenacity; but from the weight of water which it supports in glass tubes, Dr. Robison has estimated that the mutual attractions of the particles of water on a surface equal to one square inch must far exceed that of a beam of iron.

Grains of dust or sand, while dry, have no power of adhering together, probably because their forms do not permit a sufficient number of points on their surfaces to be brought within the distance at which corpuscular attractions are exerted; but, if slightly wet, the mutual attractions between the dust and the liquid produce a certain degree of tenacity: this is very sensible in clay moistened with water; for being then drawn into the form of a rod, it is capable of bearing a small weight suspended from it. Tenacity is also shown by the cohesive forces which dissolve in water, &c.: sealing-wax and glass also, when heated, lose their brittleness, and are capable of being moulded into any form, while their particles retain a considerable degree of adhesive power.

The employment of both substances is employed in conjunction with those of the body of the object to resist strains; and under MATERIALS, STRENGTH OF, will be found a table (p. 8, col. 2) of the weights which would overcome the force of cohesion in rods immovably fixed at one end and pulled in the direction of their length: these weights may be considered as the measures of tenacity in the different kinds of material; and it may be here added that, from a series of several experiments made by Mr. Telford on the tenacity of several iron bars, the breaking strength, when reduced to that where it would be if the area of the transverse section of the bar had been one square inch, is 200 tons. The bars were subjected to the action of a名单 of 4 inches in length from box 5 inches to 2 feet 3 inches; and in area, from 0.56 to 3.14 square inches: they stretched in length from 2 inches to 4 inches before they broke. Mr. Telford also found that a cast-steel beam 15 ft. 2 in. long, a bar of blistered steel 17.27 tons, and of copper (Welsh, pig) 7.30 tons; the area of the section in all being one square inch. Tenacity in solid bodies varies greatly with their temperature. Mr. Coulomb took a piece of copper, 4 by 4 by 3 inches, weighed 22 lbs. suspended from it; and, upon bringing it to a white heat, it would sustain 12 lbs. weight.

Though, when a piece of metal is fractured, the parts will not by simple adhesion adhere together, yet in some cases, by hammering them upon one another, or many points on their surfaces may be brought within the limits to which the force of cohesion extends, that they will acquire a tenacity equal to that which the metal had in its natural state.

The cohesion of the wood is much greater in the direction of the length of its fibres than in the transverse direction, the fibres being united by a substance having little cohesive power. Few experiments have been made as to the tenacity of solid bodies in perpendicular planes called; and from those of Mr. Emerson it appears to vary from one-tenth to one-seventh of the tenacity in the other direction. When a strain takes place in the direction of the fibres, they become disengaged from one another. The cohesion of solid bodies, therefore, consists of two parts: cohesion; they then become subject to separate strains, the weaker ones first ruptured, and at length all give way, leaving an irregular surface of fracture.

With respect to metals, the processes of forging and rolling are essentially those of increasing the longitudinal direction; the augmentation of friction and lateral cohesion, arising from the particles being forced together in the transverse direction, more than compensates for the diminution of the attraction which may result from the particles being forced or drawn further apart. The cohesion of copper and iron have their tenacity more than doubled, while gold, silver, brass, and lead have it more than trebled by those metals being drawn into wire.

Mixed metals are generally greater than those which are simple: the tenacity varies with the different proportions in which the metals are mixed; as the proportions which produce the greatest strength in different in different metals. The only experiments made on this subject were those of Dr. Muschenbroek; and from these we find that a compound of which \( \frac{1}{2} \) were gold and \( \frac{1}{2} \) copper had a tenacity, if not of cohesion, more than double that of the gold or copper alone: brass, composed of copper and zinc, had a tenacity more than double that of the copper, and nearly twice as great as that of the zinc: a metal of which \( \frac{1}{4} \) were lead and \( \frac{3}{4} \) were copper had a tenacity nearly double that of the zinc, and much greater than copper alone. The proportions which produced the greatest strength are different in different metals.

TENAILLE, or Fortification, is a rampart raised in the main ditch, immediately in front of the curtain between two bastions; and, in its most simple form, it consists of the earth and stones forming in direction of the bases of the bastions, and, consequently, consisting with much other entering angle. Generally, however, it consists of the faces, of which two have the directions just mentioned and the third forms a curtain which is parallel to the edges of the earth and stones, forming in direction of the bases (Fig. 1, Bastion, and P in the plan, p. 377), Fortification.

This work was originally proposed by Vauban, in order to serve the purpose, in part, of a fausses-braye (false-bray), since the fires of musketry on its face, not at an acute angle, but lying flat on the flanks of the bastions, to oppose the passage of the enemy across the main ditch when about to mount a breach in the ramparts of the place.

The relief of the tenaille, or the elevation of its face above the bottom of the ditch, is determined accordingly.
with the intention of thus defending the main ditch; and in some cases, the defenders of the tenaille might find it injured by the shot from its own batteries. In order to protect the flanks of the bastions, it is usual to make the crest of that work coincide with a horizontal plane passing three or four feet below the point where a line of fire from one of those flanks would fall at the base of a terreplein or an opening in the tenaille or its curtain. The height thus determined will allow the parapet of the work to be elevated from two to four feet above the terreplein of the ravelin in its front; and, consequently, from the curtain of the tenaille a gap is opened to the enemy, which, if not counteracted, the latter might enter, and so succeed in covering the shoulders of the bastions. They were invented by Vauban, who, however, very seldom constructed them; and subsequent engineers have generally considered them as inferior in defensive qualities to a counter-garde [QQ. Fortification, Fig., p. 377] placed over the faces and salient angle of the ravelin.

The form and position of a tenaille may be understood by being supposed to represent a small ravelin, if beyond the ditch of the latter the ramparts of the right and left faces are produced till each of them meets a rampart nearly perpendicular to the face of the bastion and extending to the place of meeting of the counterscarp of the main ditch at a point opposite the middle of that face. The works thus formed, one over each face of the ravelin before each of which a ditch is a ditch, and part of the general covered-way, the main ditch and that of the ravelin being in the rear. The two faces which are beyond the salient angle of the ravelin would, if produced towards the latter, form each with the latter, a detached parapet, whose vertex would coincide with that of the said angle.

The objections to tenailles are, that the besieger would experience little difficulty in establishing a lodgment on that part of the covered-way or glacis which is immediately in front of the curtain of the tenaille; and, in this situation, he would be able to breach the faces of the two half-bastions in four places, by fires of artillery directed along the ditches of the ravelin and those on the side of the latter to the salient angles of the tenaille. The salient angles of the tenaille, and of the ravelin which it covers, may be destroyed at the same time, and, when the ditches are dry, it would be possible to attack and carry the ravelin at the time of making the assails on the tenaille; then, the enemy having got possession of the former work, any retreatments which may have been made in the tenaille must necessarily be abandoned by the defenders.

At the siege of Lille, in 1708, one of the tenailles held out a long time, but this is ascribed by French engineers to the nature of the ground, in which there was conducted by the allies than to the strength of the work.

The re-entering space between the two faces which are in the prolongation of the faces of the ravelin, and which are consequently formed by a salient angle of the latter, may be filled by a small redoubt, consisting of two ramparts perpendicular to the faces which have been just mentioned; and thus may there be obtained a good crossing fire for the defence of that part of the covered-way which is concealed by the salient angles of the tenailles from the defenders of the bastions.

Demi-tenailles are works placed also on the sides of a ravelin, and consisting of two ramparts which are perpendicular to and nearly opposite the middle of the faces of the bastions and ravelins: these are usually accompanied by counter-gardes which cover the salient angles of the latter works, and are called Bonnets.

**TEEN.**

**TENANCY. [Tenantry.]**

**TEENT.** Tenants, in the more extended legal sense of the word, are of various kinds, distinguished from each other by the nature of their estates; such as tenants in fee simple, in fee tail, for life, &c. [Estate; Tenant in Fee Simple; Fee Tail; Life Estate; Tenant in Fee Simple.]

**TENANT AND LANDLORD.** The word tenant in the more limited legal sense, which is also the popular sense, is one who holds land under another, to whom he is bound to pay rent, and who is called his landlord. The present article is confined to the more extended sense of the word, it is proposed to show the nature, construction, and effect of the contract by which the relation of landlord and tenant is created; the rights, liabilities, and duties of each under it; how it cesses or may be terminated; and the legal means by which the rights and duties of each may be enforced.
The word land is here used in its comprehensive legal sense, which means not only the actual land itself, but also all that belongs to it, as foundations, woods, fences, and the like, which may be upon it. Any one who has an estate in land, provided he is also in possession, may let the land to another. The character and duration of the letting are partly regulated by the terms of the lease, and partly by the contract of leasing. Thus one who is the owner of land in fee simple may let the land for any limited period, while one who holds only for life cannot let for any longer period than the life upon which his estate depends, unless the lease be for a long period of years, for aforesaid powers; and to let for a longer period, the interest of the tenant will cease on the expiration of the life. To constitute the relation of landlord and tenant, the period for which the land is let must be shorter than that during which the land is held by the lessor, so that the lessor may have a reversion. If he parts with his whole interest, he is an assignor, not a lessor. Where the letting takes place by an express contract between the parties, the contract is called a lease. [LEASE.] A lease may be made by deed, by writing without deed, or by a mere verbal agreement.

By the 29 Ch. II, c. 3, s. 1, all leases, estates, &c. in land, &c. not put into writing, and signed by the parties so making or creating the same, or their agents thereunto, or by their writing, do not have the force or effect of leases or estates at will only, and shall not either in law or equity be deemed or taken to have any other or greater force or effect, &c. The second section of this act makes an exception in favour of 'all leases not exceeding the term of three years, or the making by which the rent reserved to the landlord during such term shall amount unto two third parts at least of the full improved value of the thing demised.' Under the construction which this statute has received, an unwritten lease, with a period of years, is valid in law to the extent of the rent. Such a lease does not destroy the tenancy, provided the previous existent estate be not destroyed. But the relation of landlord and tenant may be created otherwise than by a formal lease. If one man with the consent of another occupies his land, a contract of letting is assumed to have been made between them, and the occupier becomes tenant to the owner. Formerly, the tenants were called tenants at will, and might have been turned out at any time by the landlord; but now a more convenient and reasonable construction of their occupation is that they are considered to be upon the footing as if the lands had been let to them for a year dating from the commencement of their occupation. At the end of the first year, a second year's tenancy begins, unless six months' notice of the intention to determine the estate be given by either party, or the租期 be so extended as to make the land tenancy from year to year, and the terms as to rent, &c. upon which the tenant holds will be those which are agreed upon in the unwritten lease. The loss of a lease will not destroy the tenancy, provided the previous estate be not destroyed.

Generally, the tenant is bound to repair the premises. Repairs have been divided into two kinds, substantial repairs and ordinary repairs. The division appears very simple, but great difficulty often occurs in practice in determining to which class a particular repair belongs. Tenants for a long term of years are said to be liable for substantial repairs, such as beam, roof, &c.; tenants from year to year are liable only for ordinary repairs, and for injuries caused by their own negligence. A landlord is in no case, unless under an express agreement to that effect, liable to any action for non-repairing nor even for not rebuilding where there has not been a total destruction of the premises. But in the case of short tenancies, if the landlord should not rebuild or do the substantial repairs necessary to prevent the premises being put in quitting the premises and would cease to be liable for rent. It has been already observed that a tenant who has a lease which contains covenants to repair, who by holding over after his lease is expired, would be liable to the landlord for repairs, &c. If a tenant, in the absence of an agreement to that effect, is bound to rebuild after accidental destruction of the premises by fire. But under a general covenant to repair, and leave repaired, the tenant is bound to rebuild even in the case of destruction by fire.
The contract of letting may cease otherwise than by the mere lapse of time. By 29 Ch. II., c. 3, the Statute of 1806, a landlord, a surrenderer, can only be by a deed or note in writing, signed by the party surrendering, his agent authorised in writing, or by act and operation of law.

The deed or note in writing must proceed upon mutual agreement between the tenant in possession of the landlord, and, besides being signed, must be denounced and stamped. A lease may cease to exist by act and operation of law: 1, upon the acceptance by the tenant of a new lease in writing for the same premises from the landlord; 2, by operation of what is called the Statute of Uses, where the landlord against certain acts of the tenant, such as ploughing up meadow land, &c., by introducing certain provisions into the lease. These provisions may operate according to the phraseology used, either to assign a penalty to determine the liquidated damages agreed to be paid for the act done. It is often a matter of great importance and of some necessity to determine under which class the provisions fall. If under the first, the landlord is not entitled to the whole penalty upon the act being done, but he can only recover in an action the amount of the actual damage which has accrued. If under the second, he is entitled to the whole amount of the damages agreed on. A covenant by a tenant not to plough up meadow land, &c., for every acre ploughed up, is an instance of the first class: - a covenant to pay 5s. rent for every acre of meadow ploughed up, is of the second class. The right to timber and timber-like trees belongs to the landlord; topplings of pines, &c., are a commission of waste, and in the case of a tenant in possession of the farm, the right of property to be vested in a stranger, or asserts a claim to it himself, or by a breach of a condition which is expressly introduced into the lease, the breach of which makes re-entry a necessity; the landlord's failure to pay rent on a particular day, to cultivate in a particular manner, &c.

To this head may be referred provisions in a lease for re-entry by the landlord on the doing or failure to do certain acts by the tenant, such as agreements to proceed in such a way as to make the land liable for a penalty. If after the commencement of the act he does anything which amounts to a subsequent recognition of the tenancy, as by the acceptance of rent subsequently due, he will be held to have waived his right to insist upon the forfeiture.

A yearly tenancy, where no period of notice is agreed on, must be determined by a notice to quit at the expiration of the current year, given six months previously. If the period at which the current year expires is uncertain, the notice should be served at every six months, and shall first occur after the expiration of six months from the service of the notice. Where a fixed period of notice is agreed on, what has been said as to the period will apply to the period agreed on. Where different portions of the premises have been granted at different times, the service of the notice upon the principal portion will, for the purposes of quitting the premises, be considered as the entry upon the whole; and in case of a dispute at a trial which is to be held on the principal portion, the practice will be as usual. In the case of lodgings, the time, when less than a year, for which they are taken, will be the time for which a notice is necessary. Thus lodgings taken by the month or week require a month's or week's notice. A notice to quit may be waived by an acceptance of rent, or by a distress for rent due after the expiration of the notice.

If by the default of the landlord the premises cannot be occupied beneficially, as where the landlord is bound to repair, &c., and does not, the tenant may quit without notice.

The notice to quit need not be in writing, though, from the greater facility of proving it, a written notice is always desirable. It should distinctly describe the premises, be positive in its announcement of an intention to quit or require possession, be signed by the party giving it, and served personally upon the party to be affected by it.

If a tenant, after having given notice to quit, continues to occupy, he is liable to pay double rent. If he does so, he is liable to pay double value for the premises.

At the expiration of the contract the tenant is bound to deliver up possession of the premises; but if either by special agreement or by the custom of the country the tenant is entitled to the crops still standing on the land, and which are called away-going crops, he may enter for if there are other goods sufficient in value upon the premises. [Distress.]
the purpose of gathering them, and also use the barns and stables for the purpose of threshing and conveying them away. The in-come tenant may not enter without the consent of the preceding tenant to plough and prepare the land.

An action for the recovery of rent may, if the land is let by lease under seal, be in debt for the amount, or in coven-ant for the amount, of rent, or rent due at the time of the most pressing rent. If there is no indenture, the action may be in debt on the simple contract, or in assumpsit for the use and occupation of the land.

If the tenant refuses to deliver the possession of the land, the landlord may bring an action of ejectment to recover it. By 4 Geo. II., c. 28, which was passed with a view to remove some of the difficulties excused under the common law as to the necessity for a formal entry, &c. by the landl-ord, it is enacted that where there is a year's rent in arrear, or a sufficient distress on the premises, and the landl-ord to whom the same is due has a right of re-entry, he may, without any formal demand or re-entry, serve a de-claration in ejectment, which shall stand in place of the same.

By the 11 Geo. II., c. 19, and 57 Geo. III. c. 52, if a tenant, under any lease or agreement, written or verbal, though without a clause of re-entry, of lands at a rack-rent, or rent of three-fourths of the yearly value, shall be in arrear for the rent, and shall leave the premises deserted, and if the county, at the request of the landlord, may go and view the premises, and fix on the most conspicuous part thereof, and, setting on what day, distant fourteen days at least, they will return again to view the premises; and if on the second day no one appears to pay the rent, and there is no sufficient distress on the premises, the justices may put the landlord into possession, and the lease shall become void. These proceedings are subject to appeal before the judges of assize for the same county at the ensu-ing assizes.

By 1 & 2 Vic. c. 74, where the interest of any tenant of land, &c. at will, or for a time, is either by seven years, or by a period of time including more than seven years, or by a period of time including less than 20 years, shall have ended or been duly determined, and the tenant shall refuse to quit, the landlord may serve him with a notice, a form for which is given in the act, to appear before a justice for the county; and if he fails to show satisfactory cause why he should not give up possession, the justices, on proof of the tenancy and of the expiration of it, may give possession to the landlord. If the landlord was not at the time of the proceedings lawfully entitled to it, the tenant is entitled to an action of trespass at the suit of the tenant, notwithstanding the act of parliament.

'TENANT AT WILL, AND FROM YEAR TO YEAR. 'Tenancy at will,' says Littleton, s. 68: 'is where lands or tenements are let by one man to another to have and to hold to him at the will of the lessor, by force of which the lessor is in possession. In this case the lessee is called tenant at will because he hath no certain or sure estate; for the lessor may put him out at what time it pleaseth him.'

An estate at will may arise by implication, as well as by express words. Thus, where a tenant for years continues in possession after the expiration of his term, and pays rent as before, the payment and acceptance of rent constitutes a tenancy at will. So, where a man enters under an agree-ment for a term, and pays rent, and enters into the possession of an estate, he is considered at law as the tenant at will of the person who has the legal title. (10 Vin. Ab. 400; 1 B. and C. 448; 3 Camp. 8.)

Where a mortgage continues in possession of his land with the consent of the mortgagor, if the mortgage be after default in payment of principal and interest at the time stipulated in the mortgage deed, he is tenant at will. So also, where the legal estate is vested in a trustee, the beneficary owner, or custos trusti, if he be in possession, is considered as law a tenant at will under the trustee. (Cruise, Digest, tit. 9. c. 1. § 4.)

A tenant at will having no certain estate, has nothing which he can grant to another, and a person entering under a grant from a tenant at will is subject to an action of trespass. (Co. Litt. 57 a.)

A tenant at will has no right to commit any kind of waste; but, on the other hand, he is not liable to repair any such waste, &c. and cannot be distrained against him for permissive waste. (Co. Litt. 57 a; 5 Rep., 13 b.)

A tenancy at will may be determined either by express declaration of the lessor that the tenant shall have a term which must be made on the land, or, under the provisions of it to the lessee (Co. Litt. 55 b.), by some act of ownership exercised by the landlord inconsistent with the continuance of the estate, such as entering on the land, or having the trees demanated; or the landlord may give the tenant a lease for years to commence immediately. On the part of the tenant, any act of desertion, an assignment of the land to another, or the commission of waste, is a determina-"tion of his estate. A lessee determining the tenancy at will is due loses the rent; and on the other hand, the lessee who determines it before the rent is due may, with-"standing pay it up to that time. If either party to the tenancy, if it be of a house, continues till the next rent-day; and if of land, until the summer potato is received by the tenant or his representatives. (Co. Litt. 55 b, 57 a.)

Where a tenancy at will is determined by the lessor the tenant is entitled to emblements; but not if it is determined by the tenant himself. (Litt. 68; 5 Rep. 35.)

It is settled that a landlord cannot bring an ejectment against the tenant at will or his representatives when giving six months' notice to quit. (Cruise, tit. 9. c. 1. § 4.)

The courts are always inclined to construe demises—"no certain term is mentioned, not as estates at will, but as tenancies from year to year; and the circumstance of an annual rent being reserved has been considered sufficient to warrant the inference. (2 H. 1. 19. 178.) Thus, where a remainder-man receives rent from a tenant under lease for years which is void as against him, before election to avoid it, a tenancy from year to year is created. (5 T. R. 478.) Also where an agreement for the term of three years was given to the tenant, it was therefore set that the Statute of Frauds, there is a tenancy from year to year regulated by the terms of the agreement. (5 T. R. 460.)

A tenancy from year to year, when once constituted a binding not only upon the reversioner, but his sureties (1 T. R. 378), and does not cease upon the death of the tenant, but goes to his executors or admistrator. (3 T. R. 13; 15 Ves. 241.) The tenant is entitled to six months' notice to quit, ending at the expiration of the term. But if the tenant has in his possession any estate entitled to the term as often as the half-year's previous notice is served to be given at the proper time. (5 B. and C. 463.)

A tenant at will is capable of taking a release of the same after he has entered, but his estate ceases on the expiration of the term of a remainder. (Litt. 100. 68; 5 Rep. 75 a.)

'TENANT AT SUFFERANCE, says Lord Coke, that he at first came in by lawful demise, and the estate endeth continuance in possession, and may be holden over.' Thus a tenant 'autre eie, continued in possession after the death of custodie vie, a term for years holding after the expiration of his term and who, having been tenant at will, continues to be tenant after the death of the lessor, are all tenant at sufferance.

As the tenant at sufferance holds only by the lessee, there is no privity of estate between them: and therefore the tenant at sufferance is not capable of conveying the estate to another. (Cruise, Digest, tit. 9. c. 1. § 4.) On the other hand, it was held that tenants at sufferance were bound to pay any rent; but by the 4 Geo. II. c. 28, it was enacted that 'where any tenant holds over after the expiration of the term, and by the common law, such persons so holding over shall pay the yearly value of the lands so detained, for so long a time as the same are detained; or to be recovered by action of ejectment against the recovering of which penalty the tenant shall have an appeal.' By the 11 Geo. II. c. 24, it was provided that this penalty is imposed on tenants giving notice to quit afterwards holding. And by the 1 Geo. IV. c. 29. various provisions are made for enabling landlords to specify to recover possession of lands and tenements lawfully held over by tenants.
TEN
TEN

TENANT-RIGHT is the name for a species of customary estates peculiar to the northern parts of England, in which, although by custom the tenure was anciently performed before the political union of the countries, the tenant-right estates were held of the lord of the manor by payment of certain customary rents and the render of some services, and are descended from ancestor to heir according to a customary mode differing in some respects from the rule of descent at common law, and were not disposable by will either directly or by means of a will and surrender to the use of the same kind, though they are now made disposable by 1 Vic., c. 26, s. 3. And the possession of an estate in fee-simple in these estates, which do not properly belong to villenage tenure or copyright, is not held at the will of the lord, or by copy of court roll, and being alienable by deed and admissibility of the same, it has been determined that they are not freehold, but that they fall under the same general rules, the hold estates. (Doe d. Reay v. Huntingdon, 4 East, 27.)

TENANT IN FEE-SIMPLE. Atenancy in fee-simple involves a complete power of disposition over the land, and after a grant made in fee-simple the grantor has parted with his whole interest.

The words necessary for transferring an estate in fee-simple are the words, 'grant this land to you and your heirs.' (Litt., 1.) The addition of the word 'heirs' is absolutely necessary in a deed, and no other expression will serve; for any such words as 'I give the land to you,' or 'to you for ever,' or 'to you in fee-simple,' without the word 'heirs,' are deemed a grant of a non-estate, and not necessary to convey a fee-simple. But words of limitation, such as 'heirs,' are not now necessary to pass a fee-simple by devise. (1 Vic., c. 26, s. 28.)

A tenant in fee-simple dies intestate, the estate descends to the heir general of the purchaser (in the sense in which that word is explained in 3 & 4 Wm. IV., c. 106), whether male or female, lineal or collateral. [Descend.]

Lands in fee-simple in possession are subject to the control of the husband and the dower of the wife. [Courte-

y; Dowel.]

Lands in fee-simple in the hands of the heir were subject to common law as debts of the ancestor due to the crown and to specialty debts. By the 11 Geo. IV. and 1 W. IV., c. 47, a compulsory remedy was given for all kinds of specialty debts, both against the heir and devisee; and by the 3 & 4 W. IV., c. 104, estates in fee-simple are made liable in the hands of the heir or devisee for payment of the simple contract debts of the ancestor.

If a statute takes away a right of presentiment, or any other right necessary to endue the heir, which the statute leaves the offender the power of dispossessing the estate after his decease. Trust-estates in fee-simple may be forfeited to the crown, but are not liable to escheat.

An estate to a man and his heirs may be given upon conditions or limitations, which are capable of abridging or defeating it. The estate cannot then properly be called a fee-simple; but is, according to the circumstances, a conditional, qualified, or bar base. (Co. Litt., 1 b.)

TENANT IN TAIL. The origin and general nature of this estate are already described. [Estate; Remainder; Settle-

ment.]

The estate of the tenant-in-tail has some essential characteristics. He has a right to commit waste of all kinds by his own management, so long as he is living; and by doing other like acts; and this right of the tenant-in-tail cannot in any manner be restrained. (11 Rep., 50 a; 3 Mod., 489; 2 Vern., 251.) His estate, being an estate of inheritance, is called a tenant by succession; he is one who, though born after the estate tail, yet is entitled to enter into it as a tenant by his own right, when it is an estate in possession, to the courtesy of the husband and the dower of the wife. [Courte-

y; Dowel.] The tenant-in-tail is also entitled to the custody of the title-deeds, which the Court of Chancery will order to be delivered up to him. (2 P. W., 471.)

The tenant-in-tail is not bound to pay off incumbrances affecting the fee of the estate, as he has only a particular interest, and not the entire property in the land; and it appears that he is not in general even bound to keep down the interest on such incumbrances; though if he do pay off such incumbrances, it will in general be presumed to have been done in exoneration of the estate. (Cruise, Digest, tit. 2, c. 1, s. 140; and tit. 39, s. 6.) By the statute De Domis the tenant-in-tail was restrained from alienating his estate in any manner for a longer period than his own life, that is to say, the estate of the tenant-in-tail is perpetual; and it is also enacted that he shall not be guilty of mortality, and that the right of entry of the issue and remainder-men was not affected by the conveyance. But if a sequestration or fine made or levied by the tenant-in-tail in possession by virtue of the entail, caused what was called a discontinuance of the estate tail, whereby the issue and the persons in remainder and reversion lost their rights of entry and were driven to their action. (Litt., 596, 596, 507.)

This discontinuance might be either in fee, or for a limited period, but not remoter than the entail. It was caused by the conveyance of the tenant-in-tail; but while it lasted it affected not only the estate tail, but all the reman- ders and reversioners. (Litt., 620, 625.) A discontinuance might also be produced by the obligation of a warranty by the tenant-in-tail to the person for whose benefit the entail was granted. This discontinuance however was but partial, extending only to the heirs general of the person who made the warranty. (Co. Litt., 328, 329 a.) A fine duly levied with proclamations was an absolute bar to the issue, though not to the remainder-men. If any fine was called a base fee; and by means of a common recovery duly suffered, the tenant-in-tail might bar his issue and all the reman-ders over, and make an absolute conveyance of the estate. [Forfeiture.]

By the 3 & 4 W. IV., c. 74, fines, recoveries, and warranties of lands were abolished, and by the Statute of Limitations (3 & 4 W. IV., c. 27) it was enacted that 'no discontinuance or warranty which may happen or be made after that day (31st of December, 1833) shall defeat any right of entry or action for the recovery of land.' It seems therefore that no discontinuance, properly so called, can now be produced by any mode of conveyance, for what- ever may be the form of discontinuance, the last-mentioned statute takes away a right of the sovereign.

The 3 & 4 W. IV., c. 74, which abolished fines and recoveries, has substituted for them certain modes of assurance whereby the tenant in tail may now at once bar his estate tail and all the remainder over. [Fines; Re-

covery; Statute.]

In accordance with the principle which prevented a tenant in tail from alienating his estate for more than his own lifetime, leases by tenants in tail might be avoided after their death by the issue in tail. But by the 32 Hen. VIII., c. 28, tenants in tail were enabled to make leases for three lives or twenty-one years, which should bind their issue, though not the persons in remainder or the rever-

sioner.

The estate of the tenant in tail is not subject to any of the debts or incumbrances of his ancestor, except debts due to the crown, by the 32 Hen. VIII., c. 39, s. 75. Estates tail are subject to the bankrupt laws. The mode of proceeding in a bankrupt tenant in tail regulated by the 3 & 4 W. IV., c. 74, the 50th section of which expressly repeals the 6 Geo. IV., c. 16, s. 65, and virtually repeals the 1 & 2 W. IV., c. 56, s. 26. The powers of the commissioners of bankrupts as to the disposition of such estates remain.

Estates tail are subject to forfeiture for high treason by the 26 Hen. VIII., c. 13. By attainer for high treason, the estate of the tenant in tail, of his issue, and of all such of his collateral heirs as would have been entitled to take but for the death of the tenant in tail, was forfeited, but not the estates in remainder or the reversioner.

The 26 Hen. VIII. extends only to cases of high treason, and therefore as to felonies the statute De Domis is still in force, and the forfeiture by attainer for felony extends
only to the life interest of the tenant in tail. (Co. Litt., 897.)

TENANT FOR LIFE. Tenancy for life of lands or tenements is the possession of a frehold estate or interest, the duration of which is confined to the life or lives of the tenant or some other person or persons.

The estate of the tenant for life is either (1) such as is created by the terms of some of his personal legal assurances, or (2) such as arises by operation of law.

(1) An estate for life may be created by lease with livery of seisin, or by any other conveyance at common law which confers an estate in possession, or the creation of a use, or by will. The estate so limited may be either to a person for his own life, or it may be given to one for the life of another, or for any number of lives mentioned in the grant. In the last case, the estate is in effect one for the life of the survivor of the persons so named.

On the other hand, an estate may be granted for the joint lives of A and B, in which case it is in fact an estate for the life of the person who dies first.

When lands or tenements are conveyed by deed, without any express limitation of the duration of estate to be taken by the grantee, he takes an estate for life only. This however is the case only when the grantor might lawfully create such an estate; for if be tenant in tail, the estate may be a leasehold within the provisions of the stat. 32 Hen. VIII., c. 26, will pass only an estate for the life of the grantor. (Co. Litt., 42 a.) Before the 1 Vic., c. 26, a devise without words of limitation conferred on the devisee a life estate only; but now by sec. 26 of that act, though without limitation, passes the fee simple, or the whole of such other estate as the testator had power to dispose of, unless a contrary intention appear by the will.

Formerly, when lands were given to A for the life of B without any words of limitation, if A, or the person to whom he had assigned his estate, happened to die in the lifetime of B, the estate was considered as a kind of hereditas jacens, belonging to whoever first took possession; and even to him who did so before the general occup. (Co. Litt., 416.) (Occupancy.)

A gift to two persons for their lives is an estate in joint tenancy, and for the life of the survivor, if the parties continue joint tenants; but if the jointure be severed, each has then an estate in the moiety for his own life only. (2 Blackst., Com., 187.)

A condition may be annexed to an estate for life, as well as to an estate in fee simple; but the condition, it appears, must not be one prohibiting alienation on pain of forfeiture. The condition being inconsistent with the nature of the estate. (18 Ves., 433.)

(2) The estates for life arising by operation of law are, the estate tail after possibility of issue extinct, and the estate in tail by customary and in tail in estate of issue extinct arises when, by the death of one of the persons from whom the inheritable issue is to proceed, it has become impossible that any person should exist upon whom the estate tail can descend. Thus, if lands be given to A and the heirs of his body by B, his wife, or to A and the heirs of their bodies, and B die without leaving any issue of their two bodies living, A, from being tenant in tail special, becomes tenant in tail after possibility of issue extinct; which is in effect nothing more than a tenancy for life, with certain peculiar privileges remaining to the tenant out of his former inheritance, the principal of which is the right of committing waste. (Co. Litt., 27, 8; Cruise, Digest, tit. 15.)

As to the nature and incidents of tenancy by the courtesy and tenancy in dower, see Courtwor and Doww.

Tenants for life are entitled to estovers; that is to say, to an allowance of necessary wood for the repair of houses and defence of the land; but no tenant in tail, except tenant in tail after possibility of issue extinct, can cut down more timber than is necessary for such purposes, or build new houses, or open mines, without being guilty of waste, unless his estate be, as it may be, made expressly wild and waste. (Chitty.)

When a tenant for life dies before harvest-time, his executors will be entitled to the crops then growing on the lands, as a return for the labour and expense of cultivation, and these are called in law Emblements. (Co. Litt., 85 b.)

A tenant for life is not bound to pay off the principal of incumbrances affecting the inheritance, but he is bound to keep down the interest of such incumbrances. (1 Bro. R., 206; 1 Ves. jun., 283; 2 Bro. R., 128.)

In real actions all tenants for life, except tenants in tail after possibility of issue extinct, may pray in aid, or call for the assistance of any of the incumbrances or hereditary rights of tenure of the person in whose possession the evidence of the title to the inheritance. (Cruise, Dig., ch. 5, c. 1, 23.)

It seems to have been formerly considered that the tenant in tail after possibility of issue extinct only, that is, the title deeds, was entitled to the possession of the estate, which the contrary appears now to be established. (2 P.W., 477; 1 Ves. jun., 72; 1 Sch. and Lef., 208.)

The tenant for life may convey or demise his tenement by the same means as a tenant in fee, provided he does not attempt to convey any estate greater than his own.

If he convey by grant, lease for years, bargain and sell, or lease and release, he can pass no interest greater than that which he himself possesses; the conveyance for the excess is merely void, and no forfeiture is incurred, for a conveyance by feoffment, or by any assurance equivalent to a fine or recovery, if purporting to exceed the bounds of the estate, displaces the estates in remainder and reversion, and renders them both vacant. However, if the next estate in remainder or reversion becomes then immediately entitled to enter, thereby restoring all the estates which had been displaced by the torris conveyance, except that of the tenant for life, which becomes absolutely forfeited. (W. Hold., 420, t. 15, 416.)

As to the merger and surrender of estates for life see MERGER and SURRENDER.

The name tenant for life is also applied to the person to whom, in settlements or wills of personal property, an interest is given in a tenement only in the freehold of the person named. (Settlement; Will.)

TENANT FOR YEARS. (Estate; Lease; Time of Years; Tenant and Landlord.)

TENANCY in COMMON. (Common. Tenancy.)

TENASSERIM, or TENASSERIM PROVINCES, is a term which has lately come into general use to designate those countries on the west coast of the peninsula without the Ganges which lie on the south side of the Gulf of Martaban, and were acquired by the British by the peace of Yandabo (1826) with the Birmans. At that time the boundaries of this country were very imperfectly known, except that they were washed on the west by the Gulf of Tenasserim, which the British had been made both by the Birmans and Siames, which had the effect of converting large tracts contiguous to the boundary-line into complete deserts, and thus it happened that the limits of the Birmese and Siamese countries were unknown, and the southern boundary-line of Birm in the map, the first maps which were published after the peace of Yandabo laid the boundary down near 11° N. lat., but it was afterwards ascertained that the mouth of this river is south of 10° N. lat. and of Cape Victoria. During the occupation of the country by the Birmans, it had been considered that all the country drained by the rivers which flow into the Bay of Bengal belonged to their dominions, and that whose drainage went to the Gulf of Siam formed a portion of the Siames empire. When the British possessions were ascertained, this was made subject to be from 30 to 60 miles from the Bay of Bengal, but it has been ascertained that in some parts it is at a much greater distance, and that between 16° and 17° N. lat. it is probably as small as 10° N. lat., and between 19° and 20° N. lat. we know that it is from 10° to 17° N. lat., and it is supposed that the eastern boundary, at least in some parts, approaches 99° E. long. It is evident that in the present state of our knowledge of the country it is impossible to determine the true limits of Tenasserim, but we are inclined to think that the
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estimate of Dr. Heller, who assigns to it an extent of 300 by 200
square miles. The river Saluen or Salawan from its confluence with the
Thong Yin to its mouth divides Tenasserim from Birma, and the Thong Yin divides Tenasserim from the Shan States (Lacs) of Zimmay, Laboung, and Yaihang. A range of mountains running from this point through the whole of the Malay peninsula constitutes the boundary between Siam and Tenasserim as far south as the source of the last-mentioned river forms the boundary to its mouth. In the north of Tenasserim and opposite to Tenasserim are the Andaman Islands.

Coast and Islands.—The coast of Tenasserim from the mouth of the Saluen river on the north (16° 30' N. lat.) to that of the Pakcham (10° N. lat.), extends in a straight line about 450 miles, and its bends are not large, nor its inlets wide or deep, its length probably does not exceed 500 miles measured from point to point. A marked difference exists between this coast and that of the opposite coast of Coromandel. The coast of Coromandel extends in a continuous line without a single break, and does not afford a place of refuge even for a small vessel; that of Tenasserim is frequently interrupted by short projecting capes, by which several small harbours are formed, and a few indentations more in some parts of the coast of Coromandel do not admit vessels of any size, on account of the bars at their mouth, but in those of Tenasserim a considerable depth of water covers the muddy bars which lie across their embouchures. No soundings are found along the coast, the depth of the water being generally from eight to ten fathoms, whilst along that of Tenasserim there are soundings to the distance of 60 or even 80 miles, and though in some places considerable irregularities occur, the depth generally is said to be tolerably regular, the depth decreasing as we approach the land. The coast from Cape Kyckmi or Klaykami, situated on the west and close to the town of Amherst, as far south as Tavoy, is of this nature. The sea to the north of it is generally low, and in this part it is lined by a rocky reef, on which a great number of small islands rise to a moderate elevation above the sea-level. These islands are known by the collective name of Long Island, and the reef on which they rest, having little water on it, renders the approach of this part of the coast dangerous, and in many places impracticable even for small vessels. South of Mergui the coast-line is broken by several deep inlets, which form large promontories, and enclose some convenient harbours. They are hardly large enough to contain many vessels, but are so numerous, that even at present it has not been completely surveyed, and is laid down rather by guess, though of late much has been done to clear up its position by Captain Richardson and coast. It extends from 12° 30' to 11° 30' N. lat. South of the last-named inlets the soundings likewise occur, but though numerous, they do not penetrate to a great distance inland. In these parts the country close to the sea is more elevated than at any place farther north, and probably may contain many harbours for small vessels.

Numerous islands occur along the western coast of the peninsula without the Ganges, between 14° 40' and 8° N. lat. North of 12° 30' they extend to the distance of 70 or 40 miles from the shore, but south of 12° 30' N. lat. they occupy a space of only 40 miles in width. These islands are comprehended under the collective name of the Mergui Archipelago. All the sea between them and the coast of Tenasserim has soundings, though near the islands they are not less extensive than 60 miles. The swell of the sea breaks the swell of the sea during the south-west monsoon, and accordingly the channels which divide them from the main offer great advantages to vessels coasting along the coast. This circumstance, together with the fact that the islands have been frequently visited, as well as the fact that the Mergui Archipelago has only been surveyed within a few years. The islands themselves are rather high, and most of them are visible at the distance of 20 or 40 miles. The coast including the islands which occur between 12° 30' to 10° N. lat. forms one of the most beautiful and interesting in the world, as the islands are large and many smaller islands. The larger islands from north to south are Tavoy Island, King's Island, Ross Island, Donel Island, Kisse-

roicing Island, Sullivan's or Lampee Island, and St. Matthew's Island. These seven islands are more than 20 miles long, but vary in width from the three to nine miles. They are covered with timber-trees and well provided with water, but all of them have a very rugged and uneven surface, and do not appear to possess great fertility. No part of them seems to be cultivated, and they are only inhabited by a few fisher-folks. Two of these islands require notice, on account of their excellent harbours. The northern of these harbours is called King's Island Bay, being formed by the island of this name and the Mergui Island. It is about 20 miles long, and extends opposite to that of the town of Mergui on the mainland. It can only be entered from the north by large vessels, as the southern portion of the channel, which divides Plantain Island from King's Island has so little depth as to be only passable for country boats. The harbour is spacious and safe, but the entrance has some difficulties, as a shoal extends over a part of it, which has 19 feet of water on the shallowest part at high-water, and only nine feet at low-water. The second harbour is called Elephant Harbour, and occurs at the northern part of the island of St. Matthew: it is described as very spacious, and capable of containing the largest navy in the world. The soundings vary from 17 to 12, 11, and 10 fathoms nearly close to the entrance, and in the bottom of the harbour. It is reached by a single land from the sea by several small islands at the entrance, and on the other sides it is sheltered from all winds by the high hills which surround it, so that it is completely land-locked. This harbour was discovered in 1625, by Lieut. Menier, and was called by him the only safe and good of the group; the highest part, situated in the middle, is nearly 3000 feet above the level of the sea.

Mountains.—It is supposed that a continuous range of mountains forms the watershed between the river flowing on one side into the Gulf of Bengal, and that of Bengal, and that this range is the boundary-line between Siam and Tenasserim. It is also supposed that the elevation of this range varies between 3000 and 6000 feet above the sea-level, and that the summits of the highest mountains is known among the natives by the name of Thown-gee Mountains, is the most elevated portion. It is stated that in this part it makes a great bend towards the east, forming nearly a segment of a circle. But we have no account of this part of the range; it has only been traversed at the Three Pagodas, which stand near the sources of the upper branches of the river Atta-yen (Attaran); and in reading the account which Dr. Richardson gives of his travels, one would suppose that at this place the summit of the range is 9000 feet above the sea-level, for he does not say that he traversed it by a mountain-pass. The southern part of the range, when seen from the Gulf of Siam, presents only a succession of peaked mountains, of which some appear to rise to the elevation of 3000 feet. The Siamenee give the name of that part of the mountain with the name of Sam-roi-yot, which means in their language 'the 300 peaks.' Two roads are said to have formerly been used in crossing this part of the chain; and it is certain that the chain terminates, or rather has a very great depression, at the sources and upper course of the river Pakcham. This river runs from north-east to south-west, and is navigable for large boats to Karas or Pakcham, about 40 miles from its source. To the east of this place runs another river in an opposite direction, which falls into the Gulf of Siam, and is called the river of Choomphon, from the place where it reaches the sea, or Telimounfong, as Dr. Heller heard it named by the natives. The interval between the navigable parts of these two rivers, if it may be properly a tract is it even stated that at high tides the rivers rise so as to inundate this tract, and to mingle their waters; but Dr. Heller, who visited the place, does not mention this circumstance, and it is thus supposed to be in the alder authority. As far as it is known, this chain is chiefly composed of granite and gneiss. These mountains are scarcely ever very precipitous, and are generally rounded near the tops, which rise in gentle declivities. The sides are generally covered with a good deal of vegetation; a bare rock is rarely seen. Only a few spots are occasionally cultivated by the Kareans, who are in exclusive possession of these wildernesses.

Surface, Soil, and Rivers.—The general character of the country is hilly, and in some places even mountainous,
but there are also plains of considerable extent and some wide valleys. The degree of fertility which the soil possesses is determined with a very small portion of it is under cultivation; but we are inclined to the adoption of the statement of Dr. Hefler, according to which these provinces are much superior in fertility to the Malay Peninsula, by far the greater part of the soil is either of a clayey or pebbly black granite, and the numerous eddies produced by the inequalities of the bed of the river, which in these places is extremely deep. A boat once drawn within the vortex of a whirlpool is inevitably jetsam, and the wind blows either on or down, and never known to make their appearance again.

The Atta-yan or Attaran is known up to the vicinity of its source. Its principal branch originates to the south of the Three Pagodas in the Thown-gee range, and is called the Tenasserim. It is much broader, and the Zimee, or Martaban, which is a deep river, for even at a short distance from its source is three feet deep, and this depth increases as it proceeds farther down, where it is joined by numerous small rivers from the Thown-gee range. The current is never rapid and hence it is named for floating down teak timber. The tide advances to Nat Kyaung, about 70 miles from mouth of the Atta-yan. Above Attaya-yan, which is about 30 miles from the mouth of the river, the Zimee is joined by the Way-nio, which comes from the south, after the confluence of the two branches, the river called Atta-yan. This river has a very winding course and the current is hardly perceptible. As the tide, which rises to 10 or 20 feet, advances more than 30 miles above the mouth, there is a very probable that the whole fall of the Atta-yan, which amounts to 50 miles, if all its bends are taken into account, does not exceed 12 feet. The river is very deep, but lower part no bottom is found with 9 fathoms, and up Atta-yan it is never less than 15. The Gyeng or Gain comes from the east, but its upper course is imperfectly known. It is a broad river in lower course, but is shallow and full of sand-banks. The river courses 30 miles from the open sea, and by their confluence forms a broad sheet of water, which is about 15 miles long, and runs north-east to south-west, and from five to six miles wide and interspersed with numerous wooded islands. It is an expansion of a small river on the island called Phuloo-geen, or, according to Crawfurd Bald. This island is about 20 miles long, and 10 in a rage width. A chain of low sandstone hills runs through the length, never exceeding 200 feet in height. The coast of the island is composed of a black sand, which it forms only a narrow belt, which is traversed by several creeks that penetrate several miles into the island, on which behind the mangrove jungle there are plains which are covered with cultivated ground. The forest, which cover the plains contain only trees of moderate size, and there is no underwood.

Within the country just described there is an extensive alluvial tract, which occurs where the three rivers Sal-ween, Gyeng, and Atta-yan join. The principal of these rivers is the Sal-ween or Saluxen, generally called by the natives Thaun-Lweng; it originates in the south-western part of Proper China, in the province of Yun-nan, or farther to the north; its upper course is not known: in China it is called Noo-kiang and Luokiang. Running in a generally southern course, it is supposed to form the boundary between the Shian States (Laos), which are subject to Siam, and the Birman empire. This part of its course is not known. At the mouth of the Thown-gee it begins to separate Tenasserim from Birna, and this is the only part of its course which has been investigated. Though at this point the river is only about 100 miles from its mouth, and has a great volume of water, it is not navigable. The hills and rocks which obstruct its course, and are very frequent between these parts, cross the bed of the river, and form several ledges, over which the current rushes with great quickness. Near Towng-bio-myo (about 7°30' N. lat.) the rapids become much greater and the navigation even impossible perhaps during the north-east monsoon. It is succeeded by other rapids, though less dangerous, farther down, and they cease only at Colon Island (near 17° N. lat.), where the river divides into two channels. The eastern channel above is navigable. The land is rocky, and about 10 miles long, but only about two miles wide in the widest part. Even below this the banks of the river are generally bordered by limestone rocks, and the current is very quick; the river being divided into two or three branches, to which the numerous eddies produced by the inequalities of the bed of the river, which in these places is extremely deep. A boat once drawn within the vortex of a whirlpool is inevitably jetsam, and the wind blows either on or down, and never known to make their appearance again.

The Zimee or Martaban is also a plain, which is much higher than that of the Atta-yan river, as the banks of the first-named river rise to 20 feet above its face, whilst those of the Atta-yan are very low and sedge, and it is navigable. At an interval of about 30 miles the lower part is nearing the sea, and the rapidity of the current is reduced by the sand-bars, which are quite extensive, though it cannot be called mountainous. This extensive tract is covered with a deep layer of clay of considerable fertility, and the country contains extensive forests, which the ten-nue grows to a large size. But there also tracts of less fertility, where the soil is very hard and
the little Tenasserim, or Khioung-gak, which joins it at its most southern bend, and has downed a volume of water from the Sam-roi-yot range. Up to this place, where the town of Tenasserim is built, the river is deep enough for vessels of 100 tons. At the same place the Tenasserim turns to the west, having passed between two high hills, which begins to divide into two arms, which in approaching the sea again subdivide, so that, according to the survey of Captain Lloyd, it reaches the sea by six or seven channels. There is no bar which is found on the channel south of the town of Mergui has depth enough for vessels of moderate size at high-water, the tide rising between 14 and 15 feet. Below the town of Tenasserim the river still runs above 40 miles in straight line, and is the whole course of it.

The river Tavoy, which originates near 15° N. lat., runs first to the south-west, but turns gradually to the south, so that its lower course is parallel to the shore. The wide estuary by which it is connected with the sea reaches to 13° 30' N. lat.; the whole course of the river in a straight line is not less than 100 miles. It is stated that the tide, which rises from 13 to 14 feet, runs up more than 50 miles from the sea, and that to this distance the river may be navigated by both. The currents are difficult by numerous low islands and shoals. The town of Tavoy is about 35 miles from the sea, and for vessels of 120 tons burden may ascend. There is no bar at the entrance of the river, but the navigation is intricate, owing to the numerous low islands, and the two or three channels through which some vessels have only 2 or 2½ fathoms, but in most parts the depths are from 6 to 12 fathoms. There is good anchorage on the east side of Tavoy Point, which is on the west side of the entrance of the river, in 6 fathoms. The Central portion of the country, extending from 15° to 12° N. lat. The northern districts, as far south as 13° 30', present a very uneven surface. Several ridges of hills traverse the country from north to south, and it is divided into a great number of small hills. These are generally rounded near the tops, and their declivities are rather gentle. The valleys which are inclosed by them are of moderate width, and fertile. The decomposed particles of the adjacent rocks are washed by the rains from the sides of the hills, and deposited at the bottom of the valleys, where they are mixed with a large quantity of decayed vegetable matter, which makes a rich soil. Level tracts of a great extent are rare: the largest are near the town of Tavoy. The Malay Peninsula may be considered as the best region for plantations in the Malay Archipelago, and is known as the Isthmus of Kra. It is the least known part of Tenasserim. Dr. Helfer, who lately investigated its geology and minerals, found it uninhabited, with the exception of a few spots, and from his observations it appears that the whole country is covered with high hills, and contains only a few small valleys. The soil does not appear to be distinguished by fertility, and it may be conjectured, that with the Isthmus of Kra that sterile tract begins which extends over the whole of the Malay Peninsula. All the rivers, which, though favourable to the growth of fruit-trees, produces only scanty crops of rice and other grain. The inhabited places of this tract are almost exclusively confined to the mouths of rivers, and on the inland. The rivers, though they have not a long course, are said to be large and navigable to a considerable distance from their mouths. The largest are, from north to south, the Lenya, the Bokpyun, and the Pakham. The last-mentioned river, which divides Tenasserim from Siam, has already been noticed.

Climate.—Like all other intertropical countries, Tenasserim has only two seasons, the dry and the wet season. They depend on the rains being produced by the south-west monsoon, whilst the dry season lasts during the north-east monsoon. There appears to be some difference in the wet season between the climate of Moulmain and of Mergui, the two only places in which a regular meteorological observations have been made, and which, though favourable to the growth of fruit-trees, produces only scanty crops of rice and other grain. The inhabited places of this tract are almost exclusively confined to the mouths of rivers, and on the inland. The rivers, though they have not a long course, are said to be large and navigable to a considerable distance from their mouths. The largest are, from north to south, the Lenya, the Bokpyun, and the Pakham. The last-mentioned river, which divides Tenasserim from Siam, has already been noticed.
between the temperature of the air in the day and night is remarkable, as the thermometer is often found at 60° in July and in January it falls to 40°. The average temperature varies between 60° and 80°, and the weather is very constant, rain rarely falling, and only in short showers. The heat is moderated by the sea and land breezes, which blow very regularly in this season. The rainy season sets in towards the end of April or the beginning of May, and lasts to the month of November. During the first two months the rains are moderate, but from the middle of June to the beginning of September they are heavy, and they again begin almost at the beginning of October to gradually diminish. Rain falls also during the dry season, but only in showers, which occur at intervals from four to six weeks. The greatest heat occurs before the rains, and in the first two months after they have set in, but it is stated that the average temperature of the six hottest months does not exceed 94°. Land and sea breezes are regular during the dry season. At some places in the interior, which are considerably elevated above the sea, as the table-land of Meta-mio, the climate is some degrees more temperate than near the coast.

The climate is considered very healthy. This opinion is confirmed by Dr. Helfer, who lived there many years, and who says that it is the most healthy of all known tropical countries for Europeans; and he supports his opinion by the fact that the list of mortal cases kept by the medical gentlemen of the European British corps stationed at Maulmain and its dependencies show that the rate of mortality scarcely ever exceeds and is sometimes less than it would be in the countries of temperate Europe. This is the inactivity of malaria is remarkable, as many of the adjacent countries, and especially Aracan, which resembles Tenassemir in nearly every respect, have acquired a bad name for their insalubrity. Helfer cannot account satisfactorily for this phenomenon. It is not due to the sea, for the country is the eastern part of a narrow peninsula or immediately adjacent to one, and that the extensive seas on both sides produce a constant though not always perceptible current of air, by which the noxious vapours that rise from vegetable matter are carried away. The diffusion of malaria is therefore carried away. Even the exposure to the sun is rarely attended by bad effects, and the climate does not produce languor or mental inactivity, which is partly to be attributed to the coolness of the nights.

Products.—If the value of a country were to be estimated by the number of marketable articles exported from it, Tenassemir would certainly be one of the least valuable. For, if a small quantity of rice and some teak timber are exported, every article of any value which has been exported from that country up to the last few years. But it sites with any country on the globe in the varieties of its natural products, and when cultivated it will export almost every article which belongs to tropical countries. The absence of any travelling by the country has not been explored, it is known to be rich in minerals. Gold is found in some of the rivers, but in small quantities. A silver mine exists in the range of the Bo-Thong, but its value is still doubtful. It has lately been ascertained that there is copper-ore in the north-east portion of Sullivan's Island, and on the island of Cala-gisihan, near Mergui. Tin is the only metal which has ever been worked. The tin-mines are about one day's journey to the east of the town of Tavoy, and in the vicinity of Mergui. But Dr. Helfer, who has explored the southern districts, states that the range of hills which runs north of the Pakcham River is the richest in tin-ores, the grains or crystals being sometimes of the size of a pigeon's egg, and the layer in which they are found being 8 or 10 feet thick. It is however difficult to work these ores, as the contiguous country is entirely uninhabited. Tin-ore is also found on the banks of the Bokpyin river and on Dornel Island. The richest deposits of tin-ore are probably yet unknown. Iron-ore of a quality equal to that found in Cornwall is reported in the vicinity of Tavoy, and at several other places further south, especially in the districts south of the Tenassemir river. Antimony occurs in the neighbourhood of Maulmain. Extensive coral beds have been found in several places on the banks of the Tenassemir river. The coral in general is of good quality, and the best kind is near the banks of the river below the last rapids, so that it can be brought to Mergui at moderate expense. Three or four years ago this mine began to be worked at the expense of the East India Company. It is thought that the discovery of these coral beds will have some effect on the decree of the river of the Gulf of Bengal, and the ships that trade with Laccas. Limestone and marble are common in the northern districts.

Rice constitutes the principal object of cultivation; but it is not grown everywhere. The arable land is dry, and only one crop is taken. Wheat is cultivated on a small scale. Other objects of agriculture are season chilies, yam, sweet potatoes, plantains, and melons. The sugar-cane, indigo, and tobacco are only grown for local consumption. The teak is also grown for local consumption. It is thought that these last articles could be raised to a great extent if there was a demand for them. Among the trees which are cultivated the most important is the anar palm, which succeeds well as far north as 13°. S. Sings the occupation by the British, the natives have begun to cultivate it on an extensive scale, and it will yield a large article of export if the fruits of this palm should continue to be used in Europe for tanning, raising of oak-bark and sumach. In later years coffee-trees, cocoa-trees, and clove-trees have been introduced. The two thrive well, and promise to remunerate the cultivators but the success of the clove-trees is still doubtful. The produce of the coffee-trees is compared with the world quantities, and may form a small part of the trade. The mangoes grow in the Malay Peninsula and the Indian Archipelago may be raised in Tenassemir. The durian is found on the 16th N. lat., and is exported to Rangoon and other places of Av. The mangosteen has lately been introduced, but it is in its infancy. Other fruits are the pine-apples, guavas, and oranges also succeed well. In some parts the arennuto (Bixa orellana) is raised. Cocoa and the plants are rather extensive near the sea, and is also the pinnipalm (Nipa fruiticana). The toddy or palm-rose of the large countries is, of course, unknown. The country is not only rich in fruits, but in species of trees, which are not much used at present; but as the countries surrounding the Bay of Bengal are mostly desti- tute of such forests, and the demand for timber is rapidly increasing with every year, it is probable that the country will be a future source of wealth. Extensive forests of tea-trees still exist on the banks of the Ayayen, and furnish at present the most important article of export. A small number of junks are annually built by Chinese at Mergui and Tavoy for the Hopea odorata, which is always employed by the Barmese in the construction of small craft. The last timber-trees, except the coal, belong to the Hopea, Verna and Shorea; and the most numerous are the Dypsis, or large trees, which are employed in the inferior wood. All these trees when fully grown are from 70 to 120 feet in height, rising with a straight trunk 60 feet high, and before they throw out any branches they have a circumference of 10 to 30 feet. In addition to these trees there are various species of trees which have no use in the country, but are productive of wood, and plants which grow wild are numerous. There are various kinds of trees yielding caoutchouc, stelnk, gamboge, masarina, caupetu-oil, various gums, resin, oil, black varnish, sandal-wood, dammar, several kinds of substances, several dyes, aloes, and sappan-wood. Cor- mum-plants are said to be found in the mountains of the eastern boundary, and hemp grows wild on some of the new islands. Large tracts are covered with bamboo and bamboo begins to bear, having been found at a superior quality to that grown in the neighbouring countries. On the Sam-roi-yot range there is an aromatic wood, called by the natives callam, which is brought down to Mergui, and there shipped for Rangoon.

In this country the animals are not remarkable. The snakes, such as those of buffaloes, which are large. As to wild animals, Heels observes that as Tenassemir constitutes as it were the bridge by which the continent of Asia is united to the Indian Archipelago, its zoology possesses several species not found above it, and in the western parts of South Asia. The number of species common to Bengal and Hindustan is comparatively small, but in the northern districts of Teneassemir there are many species which are peculiar to that country. They are more often found east of the Burman, and even several of the Boonan and other species which have hitherto been exclusively found in the Indian Archipelago.

There are five different kinds of quadrupeds: a species of ophiorhizos belongs to the rarest animals of this place.
it is chiefly found in the northern districts, on the isolated limestone rocks. The Malay bear occurs in the more mountainous parts as far north as 13° N. lat. The royal tiger is found in great numbers, and is very strong and large; but it is also a rare animal. The Malayan tiger is common. There are also leopards and wild-cats. Elephants are numerous, and they have a wide extent of forests to range in. They are killed and eaten by the natives, but which the tribes are divided. In many cases, they are very common, and all the known Asiatic species are found. The Malay tapir, called by the natives the 'great pig,' is found in the most southern districts. The wild hog is common, and also the Sus Babiroussas. The Cebus or Prey of the archipelago, Haploxiphion Wallachii, Cervus Aristotelis, C. Axis, and C. Muntjac, with two other species, are known to exist. The Bubalus Arni and Domesticus are both in a wild state; and of the Bisons, the great Gaurus is rather rare, but B. gaur is very common. A variety of monkeys and Nectarinna, in its splendid plumage and diminutive size, resembles the humming-birds. Four species of Muras rivalryin colours the species of Java and Australasia. The Indian possessed Tennant's and the interor monalid. There are five species of panthers. The Phasianus gallus, the origin of our domestic fowls, is very common in the jungle, and the native breed is kept up by supplies of eggs from the forests. The Birundu esculentus is known to exist. The Belcher's pigeon, the Extensive range of the Mergui Archipelago, and a considerable number of the nests are annually collected and exported by the Chinese. There are several species of hawks, falcons, and hawks, and five kinds of pigeons, some of which are very beautiful from the -colours of Mergui Archipelago, where an extensive fishery is carried on by the Seengons, Malayans, and Chinese, who prepare fish for market, which is done by spreading it over a framework of Panguea-trees, and drying it in the sun: it is a daily trade on the islands. There are also several species of ducks, some of which are aquatic. The fishery of the Mergui Archipelago is almost monopolized by the Chinese, who also carry on the pearl-banks, which were formerly fished, but an amount of that purpose some years ago was not successful. Trenganu is one of the principal objects of fishery. The Malayans, natives, mother of the Archipelago, and the natives of small states by the Seengons. They constitute an important article of internal commerce, and are partly exported. They are said to be fifteen species of wild bees, two of which are without stings. The Chinese keep them in the Siam, where they are known as Siamese. - Heister estimates the population of Te ten at about 100,000 individuals, and consequently are about three to a square mile. Though this population is very small, it consists of very different races, which have led some American travellers to the belief that the was subjected to the frequent conquests to which the Malay was subjected since the time when it was ruled by Europeans. In the last two centuries the Thailands and Burmees havealternate, and more than once possessed Tenassera. These nations appear to have adopted a policy which we found mentioned in the national histories of Western Asia, namely, transplanting inhabitants of one country to another, on account of the distance from it. The bulk of the population consists of Burmians, Thailands, Siamese, and Karians or Khorens. Though these nations have some physical features which belong to the Mongol race, yet there are others which indicate the influence of the sugar-cane. The Karian approach near the Chinese: they have a head, a small nose, prominent cheek-bones, black thin beards, thin lips, and a colour more or less brown. The Burmians and Thailands are half Malays and half Chinese; indeed the features of the Karian approach so as the Caucasian form, that many of them have aquiline, a high forehead, and the European facial angle. The resemblance to the Caucasian race seems one of the most striking which appears in the Americans under the Karians as the lost tribes of Israel. The Burmians, who were the lords of the country up to the peace of Yandabo, are still the most numerous. They are settled in the plains on the rivers Atta-yan and Geyng, in the vicinity of Mergui, Tavoy, and Yee, either near the seacoast or on the banks of navigable rivers or creeks, and never far inland. They are healthy, strong, and muscular. Their principal occupation is agriculture. They are indolent and self-conceited; but honest, polite in their manners, and neither passionate nor revengeful, by which they are distinguished from the Malays. They are Buddhists, and consider the sovereigns of Ayodya as their religion; they are quiet subjects. The children are placed at an early age in monasteries, established in almost every village, and endowed by the voluntary contributions of the inhabitants: the children remain here for a certain time, during which they are fed by the monks, and instructed in reading, writing, and religion; and thus elementary knowledge is more generally diffused among the lower classes than in most countries of Europe; but provided with knowledge of the higher classes is not much greater. The knowledge of their priests is limited to the explanation of theological and metaphysical doctrines. The missionaries have hitherto failed in their attempts to convert them to Christianity, with the exception of a few isolated instances. The Burmians have led the Christians for the sake of worldly gain. This want of success is not to be ascribed to fanaticism or obstinacy on the part of the Burmans, but to their religious dogmatism, which is a great number of the Thailands and the Birmans, which has been adopted as the language of the courts, of public transactions, and of general conversation. The Thailands are likewise Buddhists, and participate in the education which their countrymen receive at the capital. The food is almost sole occupation is agriculture, and rice is almost the only object of cultivation. A small number of Thailands were settled on the Atta-yan previous to the occupation of Tenassera by the British, but a much greater number have emigrated since that event. Having arrived during the war a great partiality for the British, they feared the vengeance of the Burmians when their country (Pegu) was restored to that nation, and took refuge in Tenassera. In the year 1822, a considerable number of the settlement of Maulmain, where there are at present twenty Thailands for one Birman. When Tenassera was subject to the king of Siam, the Siamese were very numerous, but after their conquest by the Burmians, they retired to these provinces almost entirely, except the districts south of Mergui, where a number of them remained on the banks of the rivers Lenya and Bocyn, that part of the country having always remained a disputed district. The security and equitable administration introduced by the British has attracted a considerable number of emigrants from Siam, who have formed settlements in several parts of the country, especially on the banks of the Greater and Lesser Tenassera rivers. The Thailands, according to an interview of Mr. Jones, are more enterprising than the Burmians, besides being quiet, obedient, and orderly. They think that their immigration in greater numbers would be a desirable accession in the wilds of Tenassera. They have introduced the cultivation of the sugarcane, which art which they have learned from the Chinese who are settled in their country, though this cultivation has not yet become important. Many of the Siames are hunters by profession, living for months in the wilds. There are some thirty elephants in the islands, but they are also the trappors, tamers, and managers of elephants in general. Under the Burman law few elephants were tamed, but at present the practice is becoming more general through the Siamese, in whose country elephants are the most important of domestic animals. The Karians occupy exclusively the country adjacent to the mountain-range which divides Tenassera from Siam,
never being found near the sea-shore. They are said to be the same nation which occupies several mountain-tracts in Birma, and is dispersed over the delta of the Irrawaddi [BIRMA, vol. iv, p. 440], and to support this opinion it is affirmed that the Birman Karians bordering upon China, at the distance of 1 and 1/2 degrees of latitude, speak the same language which is current among the Karians of Tenasserim. This fact requires to be confirmed, for in other respects these nations differ greatly in habits. In Birma the Karians are the most industrious cultivators of the land, they are said to have planted 327 degrees of cotton and other cloths, but those of Tenasserim are an agricultural people without any fixed habitations, migrating every second or third year. When a Karian family has chosen a place for a plantation, bushes and bamboos that grow naturally are felled, and a part of the forest is cleared, just as much as is necessary to plant the ground with rice sufficient to maintain the settlers for a year. The paddy is sown upon the ground, which is imperfectly cleared, without any tillage or other preparation, and whatever else is wanted (cotton, indigo, sesamum, vegetables, &c.) is sown or planted promiscuously on the same spot. The following year another spot is cleared in the vicinity, and after some years, or when a death happens, the family removes to a new ground and begins again. Many Cotton and Indigo plantations are found covering immense forest-trees, visiting only from time to time the old establishment, which yet yields fruit for several seasons, and thus the Karian wanders all his lifetime without ever settling permanently. Rice is the only improvement in the condition of the Karians that is taking place. Their religion is heathenism. They believe in evil spirits, called nats, which have a direct influence on the destinies of mankind, and they try to propitiate them by sacrifices, offerings, and festivity. But they do not believe in the future life, or in a system of rewards and punishments, which they deposit at certain places. The attempts to convert them to Christianity by the American missionaries have been successful. A tribe of the Karians, called the Red Karians, inhabit the mountains north-east of Maulmain, and are said to be a much inferior people.

The Seelongs are the lowest in civilization among the nations of Tenasserim. They are confined to the islands of the Mergui Archipelago, and are a race of wandering fishermen, who live on fowl, fresh-water fish, sea-fowl, and bananas, during the inclemency of the monsoon, and pass the rest of the year either in boats or on the sea-beach under the shade of trees. They never cultivate the ground, but live upon the spontaneous products, chiefly turtles, fish, and shell-fish, which form their principal food. They have a peculiar language, but too little is known of it for us to determine whether it is a mixture of languages or a peculiar tongue. They form a petty tribe, not exceeding, it is said, 1000 souls in number, and it is very difficult to meet them in the islands which they speak a dialect of the same. Their language is said to be intelligible to them themselves whenever they see a strange sail approaching. This is probably the effect of their having suffered much from the pirates, who, until lately, infested those seas, and it serves to explain the statement of the early European navigators, who landed on these islands, and found them uninhabited. The Seelongs have a vague idea that there are certain invisible beings which exercise an influence over the destinies of mankind, but there is no established mode of worship, and they are entirely ignorant of a future state. No attempt has yet been made to convert them.

Hefler reports, that among the natives the opinion is general that in the most mountainous part of the country there is a race of wild men, who shut all intercourse with their fellow creatures, and seem to be savage. He is much inclined to think that these wild men are the gigantic orang-outangs of Sumatra. But the Andaman Islands are inhabited by a pure race of men, the lowest in the scale of intellectual beings, which seems to belong to a race different from the Asiatic Indians, and only degrees farther south, in the kingdom of Queda, a small tribe, the Sambag, are found [MALAY PENINSULA, vol. xiv, p. 327], which greatly resemble the inhabitants of the Andaman Islands, and it is improbable that the small remnant of such a tribe may still exist in Tenasserim.

The Karians, Seelongs, and the last-mentioned race are probably aborigines: the others have emigrated from the mainland of India. Many Chinese are settled in the sea-ports, where they are merchants, ship-owners, ship-builders, spirit-distillers, carpenters, blacksmiths, bakers, and gardeners. A few of them settled when the country was subject to Birma, and others have come since the occupation by the British. They are married to Burmese women, but their children, if males, are brought up by Chinese, and adopt the customs, manners, and dress of their fathers. There are also a number of Chinsali, or natives of Coromandel, settled in the places where Europeans reside, with whose customs and wants they are much less acquainted than the natives, and by administering to what they gain their living. The Karians, Seelongs, and the remaining tribes who have been converted into useful members of society, many of them have married, and on the term of the banishment expiring have settled in the country. A few Armenians and Parsees are settled, being the only place in Tenasserim where trade is carried on.

The English settled in Tenasserim are almost all official capacities, either civil officials of government or minor duties for the Parsee merchants, and are not numerous here. The number of private persons is small, and that of all of them are congregated in Moulmain, where they are chiefly engaged in ship-building, or otherwise connected with it, and many are soldiers. There are also a number of Parsee Missionaries, and many descendents of Parsee traders. By intermarrying with native women, they have partly lost the advantages of European civilization, their religion being nearly the same with that of the natives, and being attached to the mode of living of the aborigines, to which their predecessors have been faithful. They are also mostly preserved their language, but it is barbarously corrupted.

Tenasserim, a country so little cultivated, and the population which is dispersed over such an extent, their can be no large towns. When the British took possession of the country they founded the town of Ameber, near the mouth of the Martaban river, hoping that the commerce of the country might settle at this place; but the expectations have not been answered. Moulmain, which was at first only a military post, has since risen into importance and is now increasing, as its situation near the confines of the great river of the Salween is the most favourable place for relying on the trade in teak, which constitutes the most important article of export. Ship-building is the only trade which is carried on to any extent. The town of Tenasserim is also small, but it has some commerce with Moulmain, and is considered as a safe and well-protected harbour. The roadstead is between the mainland and Madraccoa Island, with a deep bottom in from 6 to 15 fathoms, and large vessels can be sheltered from all winds. It is about six miles from the town. But vessels of moderate size can go farer up the river, and anchor off the town in five fathoms. Though it is at present a small place, it will probably grow to great importance, as in the country at the back of the nearest deposits of coal, and they have been discovered. The town is also particularly well adapted for plantations of spice-trees, and the Siamese have begun to cultivate the cane for making sugar; it is also well suited for commercial intercourse overland with Bangladesh, and for the cultivation of sugar and cotton, for the name. Tenasserim, an ancient town, which however was destroyed in the wars between the Siamese and Birma, is in ruins, but will probably be revived, owing to the roadstead, the architecture in the neighbourhood and the sloop navigation extending to the river.
and tobacco from Rangoon, and spices and sugar from Penang. The chief exports are tea and rice; there are also exported ivory, wax, tin, nut-oil, trepang, edible bird's nests, and bamboo. The only places with which a commercial intercourse exists are Calcutta, Portbello, and Penang. It is hoped that an overland connexion will be established between Maulmain and the south-western provinces of China, especially Yunnan, as caravans from these parts annually visit the Shan States (Lac) north of Thaton, not the plaintiff therefore. A few years afo a intention to proceed to Maulmain, but were prevented by political circumstances.

History.—Nothing is known of the early history of these provinces. When they were first visited by the Portuguese it appears they consisted of a great number of petty states, of which we know nothing now. It seems that at that time the bulk of the population consisted of Thilans, and probably the country formed a portion of the kingdom of Pegu. It was afterwards connected with Siàn, from which it was wroten by Alampra, the founder of the present Birman dynasty, about the middle of the last century. Notwithstanding the repeated contests and invasions of the Siamese, it remained a part of the Birman empire until it passed into the hands of the British on the 24th of March, 1869. At that time the population was estimated at 50,000 individuals: at present it probably considerably exceeds 100,000. It forms part of the government of Penang.

Cox's Journal of an Embassy to the Court of Ava; Loomes' Mission to Birmania in 1830; Nain's Historical Collections; Foster's Voyage to the Mergus Archipelago; Helfer; several Reports on the Tenasserim Provinces, and its Geology, inserted in the Journal of the Asiatic Society of Bengal, 1836; Rich-ardson's Journal of a Mission to the Court of Siam, in the Journal of the Asiatic Society of Bengal, 1840; and their successors.}

TENBY. [Pembroke-shire.]

TRNC, a fresh-water fish belonging to the family Cyprinidae, or Carp tribe. [Tinca.]

TENDER. A tender is the offer to perform some act. It is generally made in order to pay money on behalf of a party indebted, or who has done some injury, to the creditor, or to the party injured.

A tender to the amount of forty shillings may be made insincerely; but beyond that amount it must be in good. If a tender be made of a larger sum or variously divided, and no objection be taken at the time to the money tendered must be actually produced and shown, or the least bag or other thing which contains it shown to the party to whom it is intended to be made, unless it is accompanied by some declaration or act by the creditor. The assignation with such strictness, that even though A party tell his creditor that he is about to pay him so much, and put his hand into his pocket to produce the money, if the creditor leave the presence of the debtor before the money is actually produced, the tender will have been made: but if the creditor refuses to receive the money mentioned on the ground that it is insufficient in amount, the actual production of it is not necessary to constitute a valid tender. The offer must be absolute and without charge; as offer with a request of a receipt, or on condition that some thing shall be done on the part of the creditor, are not valid tenders; but an offer of a larger sum absolutely without a demand of change is good, A tender made in this manner, although the creditor and the managing clerk of the creditor refuses to receive it, assigning that circumstance as his reason for doing so. If the attorney write to the debtor demanding the money, a tender afterwards made to him or to his managing clerk is not good, unless it is accompanied with a demand of change. The tender offer to the agent or servant authorised to receive it, or to a managing clerk; and a tender will not be gratuitously even though before it is made the creditor has made the blood-vessels of the Siamese are the chief source of the nation's wealth, and they are, in a corresponding degree, compact and strong. The blood-vessels of the Siamese are the chief source of the nation's wealth, and they are, in a corresponding degree, compact and strong. In the flat membraneous the cellular tissue is much more abundant, and fills up large inter- spaces between the fibrous bundles. The blood-vessels of the tendons are numerous do the blood-vessels of the tendons seem to be. In the round compact tendons they are scarcely discernible; but when well prepared, the same arrangement is observed in them as in the blood-vessels of the Siamese. The cellular tissue in the blood-vessels is run in parallel lines between the fibrous bundles, rarely dividing into smaller branches, and communicating by short canals which pass transversely across the bundles. The blood-vessels of the tendons are chiefly derived from the vascular system of the muscle tissue which is admitted that in most instances a large branch runs across the line of boundary between the muscular and tendinous fibres, and gives off many smaller branches to the latter.
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At that end of a tendon which is affixed to a muscle each primitive fibre or fasciculus of the latter (Muscles) terminates in an abruptly-rounded extremity, which is embraced by a fasciculus of the filaments of the tendon, expanding and enclosing it in a ring, or in a manacle, which is coarsely rounded by placing the end of the fore finger of one hand within a circle formed by the ends of all the fingers of the other hand. The larger bundles of cellular and fibrous tissue in the tendon are also continuous with the cellular tissue which is placed between the secondary fasciculi of the muscle.

At their opposite extremities the tendons are usually affixed to bones. Their fibres are intermixed and firmly united with those of the periosteum, and often pass into the substance of the bone. Although the chief and proper office of tendons is to serve as media for the action of muscles, yet many of them fulfil other purposes in the economy. Thus the aponoe-

roses of the abdominal muscles form a great part of the walls of the abdomen, and, by their toughness, support and protect the organs within its cavity; the tendons of the muscles of the fingers add strength to each joint over which they pass; and many, in other parts, are arranged as ligaments.

TENDRAC. [Tendrak.] TENDRILS, or Cirrhii, are those elongated and filamentous organs of plants which possess a power of twisting in one direction or another, and by which the plants on which they are attached are enabled to encircle other plants, and thus to elevate themselves. Tendrils are only found on those plants which are too weak in the stem to enable them to grow erect. In most cases the tendrils are only forms of the petiole; for although they may occur on the part of the stem which is in connexion with the flower, they are regarded as apomorphic organs of the leaf. Tendrils are distinguished according to the parts of the leaf from which they grow. When the tendril consists of the elongated petiole of a compound leaf, it is called a cirsus pedunculare. When it is extended from the point of a single leaf, as in the Gloriosa superba, it is a cirsus foliis et; and when it occurs in the petals of a flower, as in Strophanium, it is called cirsus corollarii. Those tendrils which are in connection with the stem alone, as those of the passion-flowers and vines, are called Capreoli. The type of these organs however is the same in all cases. (Bischoff, Würterbuch der beschriebenen Botanik.)

TENÉDOS (Tinos), an island in the Greek Archipelago, off the coast of Troas, in 39° 47' to 41° 19' N. lat. and 25° 30' to 30° 8' E. long. It is said to have been antically called Leucophry. The island is supposed to have derived its name from Teneus, the son of Ceymus, king of Colone in Troas, who reigned over the inhabitants, and was afterwards deified by them. (Pausanias, x. 14; Schol. on Hom. ii., 137; and more particularly by Dr. Burnet, in his admir. of Homer, 36 324), it was sacked by Achilles, and occupied by the Greeks when they retired from the siege of Troy immediately before its capture. (Virg., Aen., ii. 21.) This connection with the story of the Trojan war has given Tenedos some celebrity. It was colonized by the Corinthians from Amycla in Laconia, under the command of Peisander and Orestes. (Pindar, Nem., xi. 45-6; Herod., i. 151.) Little mention is made of Tenedos in ancient history. It was independent in the time of Cyrus, king of Persia, but was made subject to him in the reign of Alexander the Great (b.c. 433): it was afterwards a tributary of Athens, and in the fourth year of the Peloponnesian war took part with the people of Methymna against the rest of the Lesbians. (Thucyd., ii. 2.) Pausanias states that the Tenedians, being unable to defend themselves, submitted at some period of their history to Alexandria in Troas. Aristot. (Hist. Vet., i. 16) mentions some dispute as having recently occurred between them and the Sigeians, in which they received the support of the Corinthians and the Ionians, in a war against the Sigeians. (Ibid., i. 2.) Pindar (Nem., x.) speaks of the Prytanes, or yearly magistrates of Tenedos, to one of whom, Aristagoras, he addresses this ode. It appears from Stephanus Byzantinus that Aristotle wrote on the constitution of Tenedos. On the ancient silver coins of the island are the types of a double-edged ax of a peculiar form; and on the reverse a bifacial head like that of Janus. The 'Tenedicara' (ax of Tenedos) was a proverb expressing any summary mode of executing justice or dispatching an affair; derived from the law of a king of Tenedos, mentioned by Arrian, who ascribed it to Severus, which permitted a person who caught others in adultery to kill both parties with an ax. (See the passages quoted by Eckehl, and Cid. Ad. Quintum Pr., ii. 11.) The last of this island occurs on oin. In the worship of the deity here, and its transmission to Tereza near Corinth, Müller, Doriens, i. 247.

According to Strabo (p. 604) there were two harbours at Tenedos. It was used by the emperor Justinian as a depôt for the wine going from the island, and afterwards for foreign wine. The wine was said to be of fine quality; and the whole town was at one time a celebrated wine grows, but in the Tenedos which is now its name, there is no wine cultivated in the interior, and produces what is very fine red wine.

TENEMENT is a word employed in descriptions of property. Though in its usual and popular acceptance it is applied to houses, the word is used of a right or interest in land, whether original and proper and legal meaning it includes everything of a permanent nature that may be held, whether separal or incorporeal. It is sometimes used in a more extended sense, including all appurtenances to a feudal tenure; but in general it includes not only but every modification of right concerning it. The term word 'Librum tenementum,' frank-tenement, or frehold, is applicable not only to lands and other solid objects, but also to appurtenances of rents, services, commons, and the like. (Hamp. & Litt., 155. a. n. 7.)

TENERIFE, or more properly TENERO, is an island of Chinefe by the original inhabitants, the Guanches, the largest and most important of the Canary islands. It stands in the north, between the 28° 30' N. lat. and 20° 30' W. long. of the equator. It is a large and hilly island, and one of the most northern, Punta del Hidalgo, in 28° 30' N. lat. and 20° 30' W. long. The eastern part, Punta de Agua, is in 16° 59' W. long. and 25° 30' N. lat. The western part, Punta de Tena, in 17° 59' W. long. and 23° 30' N. lat. The distance from south-west to north-east is about 55 miles, and the breadth from east to west about 32 miles. The country is in general mountainous, and the remains of ancient structures are abundant. The crater of the Cono de Vera, called Caldera, is of an oval form, and only 300 feet long from south-east to north-west, and 200 feet in the opposite direction. It is distinguished by
The plain of Laguna occupies the middle of the island, near 16° 29' W. long.; it is about 1700 feet above the sea, and enclosed by hills; the surface is nearly a dead level, occupying a space of about 12 square miles. After the rains it is partly covered with water, and hence is derived its name. The soil consists of a reddish clay, and produces abundant crops of grain, but not part of it is covered with trees.

The eastern portion of the island, or the peninsula which extends east of the plain of Laguna, is only hilly in comparison with the western. On the summit, the Buñolero, rises only to 3069 feet above the sea-level. In this part no traces of lava and no volcanic cones occur: the hills consist mostly of black basalt: the valleys are numerous, but narrow. These valleys and the adjacent plains are cut by sharp-edged ridges and are surrounded by a flat table-land. This surface is not too steep: they produce the finest fruits in the island. The country descends gradually towards the east, and Punta de Anaga is only elevated a little above the sea-level.

**Climate.**—Teneriffe, being situated near the tropic, partakes of the climate both of the countries within and without the tropic: it has only two seasons, a rainy and a dry season, but the rainy season does not occur when the tropic is near its greatest southern declination. It occurs in the same period of the year as in southern Europe. The dry season is produced by the trade-winds, which, when the sun approaches the northern tropic, proceed farther north, and even 16° 30' N. The season begins with a blow on Teneriffe without interruption from April to October, and always from the east-north-east: they are strongest from the middle of May to the middle of August. The wind begins in the morning between ten and eleven o'clock, and continues in this direction, and in the trade-winds which blow from Madeira to Teneriffe it generally takes ten or twelve days, and sometimes even three or four weeks. A voyage from Madeira to Teneriffe is made in two days, but it takes more than a month to sail from Teneriffe to Madeira. During the rainy season the weather is constantly fine, and not the drop of rain falls.

In the rainy season, from October to April, south-west winds prevail: in October the winds turn to the east and south-east, and the summit of the Peak of Teyde begins to be covered with clouds, and the table-land, on the south. These clouds accumulate on the Peak, and gradually descend lower. When they have sunk to about 6000 feet above the sea-level, and cover the most elevated part of the island, they produce in the soil the best climate for the production of trees, and the air is full of the rain; the air rests on the mountain about four months. At the beginning of November the wind is settled in the south-west, and whilst it blows the rains sometimes last for three days. This depression is called El verano, and the hot winds, which blow before or after the beginning of the rainy season. Its effect on all organic bodies is very great, and the heat which it brings from the Sahara is felt much more in elevated places than near the sea-shore, the more so as water is very scarce in those parts, and the show of wind produces intolerable heat. In those higher places it blows with such force that it frequently blows down men and horses. The air is misty, and it is not possible to distinguish objects even at a moderate distance; but there are no clouds in the sky in the wind. Sometimes this wind brings locusts in large numbers to the island.
formerly thought that these insects reached the island by flying, but MacGregor states that such immense numbers of them are carried from the Sahara into the sea as to form a thick layer; and that in this way they are carried to the Canary Islands, and that most of them are dead when they arrive there, but those which cover the upper surface are alive, and spread their devastation over the corn-fields and plantations.

We subjoin the meteorological observations made at Santa Cruz and at Laguna: the last-mentioned place is about 1700 feet above the sea.

<table>
<thead>
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<th>Santa Cruz</th>
<th>Laguna</th>
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<td>65° 45'</td>
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<td>65° 02'</td>
<td>65° 45'</td>
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This table shows that the climate of Teneriffe is distinguished by its moderate temperature, and that the heat of the summer is prolonged to the month of November. October being considerably warmer than May, and November than April.

Productions.—All European domestic animals are reared, and also white camels, which are used as beasts of burden, and reared on the west coast of the island, but not in the Canaries. There is a great deal of cattle and other produce, on account of the want of pasture-ground. They are kept for slaughter and for the plough: the cows are never milked. Horses are still less numerous. They are of good breed, and very hardy and very hardy, and their milk is exclusively used, and butter of a white colour, called 'mantequilla,' and a large quantity of cheese, are made of it. These goats are of a peculiar breed, which existed on the island before the arrival of the Europeans. They constituted the principal riches of the Guanches. Sheep are also numerous. The breed is small, and the wool is coarse, but abundant: it is consumed in the island. Ases are rather numerous, but small: mules are much used as beasts of burden. According to MacGregor, the number of cattle is about 4800, of horses 1000, of camels 60, of mules 1400, of asses 2200, of goats 30,000, of sheep 18,000, and of hogs 3000. The silk-worm is extensively reared, and the annual produce of silk may amount to 8000 lbs., but it fetches a less price than the Italian silk, not being so well prepared. In 1828 the cochineal insect was introduced, and the first trials at rearing it succeeded very well. We are not acquainted with the result of this attempt. Bees are abundant, domesticated. The honey is also rather inferior, especially that which is collected in the neighbourhood of the Peak of Teyde, which is extracted by the bees from the blossoms of the retama plant. Between 2000 and 8000 lbs. of wax are annually collected. Rabbits are very numerous.

The domestic birds are fowls, ducks, geese, and pigeons. A great number of turkey are reared. The number of wild birds is very great. Some of them are always found on the island, and others arrive only at certain seasons, in their migration from north to south, and vice versa. The most remarkable belonging to the first class are the wild pigeon, various species of Tetraonidae, quails, and larks. The canary-bird is common. Fish is far from being abundant. The principal fish, mostly on potatoes, is obtained from the fishery on the coasts of Africa [Sahara, vol. xx., p. 317]; but of late the inhabitants of Teneriffe have abandoned this branch of industry, and buy the fish from the fishermen of the other islands. Whales are sometimes met with among the Canary Islands, and still more frequently dolphins. Seals rarely visit the coast.

The principal objects of agriculture are potatoes, wheat, maize, barley, and rice. Where the soil is good, and means of transport exist, two crops of maize, and one of potatoes, or two of potatoes and one of maize, may be raised in twelve months. According to an average of five years (1800-1804), the annual produce was about 70,000 quarters of potatoes, 21,700 quarters of wheat, 8511 quarters of maize, 5918 quarters of barley, 2300 quarters of rice, and only 40 quarters of oats. It is however stated that since that time the cultivation of grain, and especially that of potatoes, has considerably increased. Other objects of cultivation are flax, canary-seed, sunnach for the teasteries, pumpkins, cucumbers, yams, cabbage, peas, Turkish beans, garbanzos, lentils, lettuce, capucins, onions, and cabbages. The orchards produce apples, pears, cherries, plums, peaches, nectarines, apricots, peaches, marolls, almonds, chestnuts, and other fruits. The orchards yield a great quantity of good wine. The wine of Santa Cruz is considered to be the best on the island, and the annual produce amounts to 23,464 pipes, each containing 100 gallons, but it is stated that this quantity from 6000 to 6500 pipes only is consumed during the year. There are many brandy and spirit shops. The annual produce amounts to about 2500 pipes. But the war between Spain and its American colonies, to which a large quantity of wine and brandy was reported, has considerably diminished the branch of wines, and at present the annual produce amounts to about 1500 pipes. The best sort, known by the name of Vino de Madeira, and is sent to England. The Malvasia was formerly in great request, but the demand for it has considerably diminished. The difficulty of obtaining a remunerative price for their wines and brandies has, less induced the inhabitants to introduce some other objects of culture. Cotton has begun to be cultivated; the produce resembles that of Perambuco. They have also made some attempt to cultivate tobacco. The island of Teneriffe was the most important branch of cultivation, but there is now only one sugar-mill on the island.

Large forests still cover some of the higher parts of the island, though they have been greatly reduced. Among the trees grown are pines, cedars, oaks, hickory, and pines. Two or three wild or3ing plants are used for making madeira, and the Mysoream- thenum crystallium is cultivated for that purpose. Some oak is cut. Two kinds of lignum which grows on the rocks are collected for their medicinal qualities; the liquor is made, and the bark is used for tinctoria, which yields the salvia, and the parke: they are mostly sent to England.

Teneriffe has no metals, except some iron-ore, of which no use is made. Sulphur occurs in large quantities at the Peak of Teyde.

Population and Inhabitants.—According to an estimate of MacGregor, founded on the old census of 1802 and other data, the population of Teneriffe amounted, in 1828, to 35,000 individuals. Inhabitants of Guanches, who inhabited the island at the arrival of the Spaniards, perished in the war by which the Spaniards put possession of it, and the remainder intermarried with the Spaniards. The chief towns are considered as Spanish towns, whom they also resemble in person and character. The Spanish language alone is spoken in the towns and in the remote parts from the towns with the other islands.

Political Divisions and Towns.—For the administration of justice the island is divided into three jurisdictions, the courts for which are at Santa Cruz, Laguna, and Orotava. Santa Cruz de Teneriffe is the seat of the governor-general of the Canary Islands, and is built on the south coast of the island, not far from its eastern extremity. The harbour is not large, and is well protected against the winds, except those that blow from the south. At the distance of 6 nautical miles is 100 fathoms from the land they are good anchorage in 5 to 12 fathoms. The roadstead is safe and sound for 30 fathoms. The lowest part of the town is more than 20 feet above the sea-level, and the ground rises gently. The houses are built in the Spanish Moorish fashion, with a court-yard or patio in the middle, and have only one floor. The streets are straight, but narrow, and crooked. The population amounted, in 1823, to 8520 individuals. The place carries on a considerable commerce, and the harbour is annually visited by 80 to 100 vessels.

Santa Cruz is considered the capital of the island, being the seat of administration. It is built to the middle of the plain of Laguna, and is a pleasant place. The streets are straight and wide, well paved, and have few pavements. Most of the houses have only one story. The inhabitants of Santa Cruz pass the summer months here, as the climate of Laguna is much cooler.

Taconorte, not far from the northern coast, is a village, has 4600 inhabitants.
Quezava is on the declivity of a steep hill, nearly 1200 feet above the sea-level: it is a well-built and thriving place, with nearly 8000 inhabitants. It carries on a considerable commerce by means of its harbour, called Puerto de Oro, which is about 2 miles distant, and contains a population of 4600.

Gallar, on the southern coast, is in a very fertile valley, which produces much wine and wheat: it is rather well built, and contains 3000 inhabitants. In the vicinity are the tombs of the ancient inhabitants, the Guanches, which contain mummies.

Manufactures and Commerce.—There are a few manufactures of silk stuffs at Icod de los Vinos, a town on the north coast, with 4000 inhabitants. These manufactures were very active, and their produce went to America; now in a declining state, especially since the Teneriffe have begun to wear cotton instead and woollen stuffs are made by the families for consumption. Woollen stockings were for a degree of perfection by his son. He died at Antwerp in the year 1649, at the age of sixty-seven.

Teniers, David (the Younger) was born at Antwerp in 1610, and received his first and principal instruction from his father. Some authors have affirmed that he left his father to become a disciple of Adrian Brouwer, who however was only two years older than himself, and that he had the advantage of the precepts of Rubens. Others have pretended that he was like a pupil of Elsheimer, who died when Teniers was only ten years old. He adopted, as we have observed, the subjects and style of his father; but, with a more fertile imagination, he produced compositions much more varied and ingenious; his colouring is more vivacious, and the facility and the advantage of his execution is enchanting. He studied nature in all her varied forms with the most critical attention. He possessed, in perfection, what we have heard one of the brightest living ornaments of the British school call 'the art, or rather the gift, of seeing.' Hence the truth and nature of his pictures, which look almost like reflections in a convex mirror. His pencil is fine and delicate; the touching of his trees light and firm; his skies are admirably clear and bright, though not much varied. The expression of his figures, in every varying mood, of mirth or gravity, good or ill humour, is strongly marked, striking, and natural; he represented them however precisely as he saw them before him, but was perhaps inferior in delineation of character to Jan Steen or Wilkie.

It is remarkable that at the commencement of his career very little regard was shown to his merit, so that he was often obliged to go to person to Brussels to dispose of his pictures. But he was not long neglected. The archduke Leopold having seen some of his pictures, immediately distinguished him by his patronage, appointed him his principal painter and gentleman of his bedchamber, presented him with a chain of gold to which his portrait was affixed, and gave him the direction of his gallery of paintings, which contained works of the most eminent masters of the Italian and Flemish schools. Teniers, who possessed an extraordinary talent in imitating the works of other artists, made copies of this gallery, in which he touched, the colouring, and the manner of the several painters, however different from each other, were reproduced with such a deceptive fidelity, that he acquired the name of the Proteus of painting. Some writers have objected that his figures are too short and clumsy, and that there is too much sameness in their countenances and habits: but it must be remembered that he designed every object as he saw it; and the charm which his art has thrown on scenes flat and insipid in their forms, even subjects low, barren, and commonplace, justly excited the admiration of all lovers of the art, and the extraordinary prices which are given for his works in every part of Europe are an incontestable proof of the universal admiration and esteem in which they are held. This circumstance is the more deserving of attention, as his works, from being scarce, are extremely numerous: his extraordinary facility of execution and the great age to which he attained enabled him to produce such a number of pictures, that he was used to say in joke that to hold all his paintings (though they were of such small dimensions) it would be necessary to build a gallery two leagues in length. It is worthy of remark that while of all the Flemish painters his works are the most popular, he was habitually conversant with the higher classes of society. The savvity of his manners and his irreproachable conduct secured him the esteem of all his countrymen. Besides the archduke Leopold, he was honoured with the favour and protection of Christina, queen of Sweden, the king of Spain, Don John of Austria, who became his pupil, the Prince of Orange, the bishop of Ghent, and other eminent personages. He often assisted the landscape-painters of his time by inserting figures into their pictures, and many works of Artus, Van Uden, Breughel, and others derive additional value from this circumstance. The galleries and collections in England contain a great number of his finest works. He died at Brussels, in the year 1694, at the advanced age of eighty-four years.

(Tenison; Thomas) (born 1636, died 1713), an Eng-
lsh divine, son of a clergyman in the diocease of Ely, who
was advanced by his own deserved reputation for piety,
character, learning, and liberality, to the highest station in
the English church. He was born at Cottenham in Cam-
bridgeshire, educated in the grammar-school at Norwich,
from whence he passed to Corpus Christi College, Cam-
bridge, where he was admitted in 1653, and took his
bachelor's degree in 1659. The university was then in
the state which had been brought by the parliamentary
commissioners, and the turn of mind of Tenison not ac-
cording with what at that time was expected from persons
undertaking the ministry, he for a time turned to the study
of medicine. About 1660 he was accidentally ordained
by the episcopal method then proscribed by the govern-
ment of the time. The ordination was performed at Rich-
mond in Surrey by Dr. Dappa, the expelled bishop of Sal-
isbury. The restoration of the king, and with it of the
episcopal church, soon following, he was made minister
of St. Andrew's Church in Cambridge, in which situation he
had gained much credit by his attention to his parishioners
during the time of the plague, in 1665. He had other
preference in the county, as the church of St. Peter-
church in Norwich, and the rectory of Holywell in Hunting-
donshire. This brings down his history to the year 1680,
when, being then doctor in divinity, he was placed on a
more conspicuous stage, being presented by King Charles
12th. and Dr. Sibell's in St. Martin's in the Fields.
In this public situation he acted with great prudence,
and with a liberality which emulated the munificence of
the clergy of earlier times, giving more than 3000. to
the poor of his parish in the time of the distress occasioned
by the plague in 1665, and endowing a grammar-school, and
engraving and furnishing a library. In 1665 he discharged the dif-
cult duty of attending the duke of Monmouth previous to his
execution with singular discretion. In his politics he was a
Whig, a friend of the Revolution, and was accordingly
marked out by King William for advancement in the
church. In 1689 he was made archdeacon of London, and
in 1691 bishop of Lincoln. This large diocese, which had
been too much neglected, he brought into order. In 1694,
or shortly after, in the absence of Dr. Tillotson, he made archbishop of
Canterbury, in which high dignity he remained for twenty
years. He died on the 3d of December, 1715, and was
interred in the parish church of Lambeth.
A large account of his life was published soon after his
death, without the name of any author in the title-page,
but evidently written by a person possessed of good
information, and who was fully sensible to his merits.
He speaks of him thus:—And as he was an exact pattern of
that exemplary piety, charity, self-denial, and good con-
duct in the affairs of the church, so prevalent since the primitive
age of Christianity and the time of the Apostles there has been no man whose learning and abilities have better qualified him to discharge and defend a
great and important trust.
The library which he founded in the parish of St. Mar-
tin's still exists; and he may be regarded as the founder
of the library in the cathedral church of St. Paul, having
presented two hundred and fifty pounds to make up four
hundred and fifty, which the dean and residents gave
for the libraries of two clergymen bought by them in 1707.
His will contains many munificent bequests for charitable
and religious objects.
As a bishop Tenison has left no writings behind him
which can be said to make part of the general literature
of the country, or to establish for him a literary reputation.
Yet he published several treatises, mostly connected
with the religious and political controversies of his age.

TENNANT, SMITHSON, a distinguished chemist, was
born at Selby, in Yorkshire, November 30, 1761, and died
February 22, 1815. He was the only child of the Rev.
Calvert Tennant, of whom little is known except that he
had been a Fellow of St. John's College, Cambridge, and
with Mr. Dr. Rutherford, Regius Professor of Divinity
in that University.
While very young he gave many proofs of a particular
turn for chemistry and natural philosophy, and after quitting
school was very curious of completing his chemical studies under the immediate instruction of Dr. Priestley, who was then enjoying high and deserved reputation
for the extent and variety of his discoveries in pneumatic chemistry, but this was found impracticable in consequence of the previous engagements of Dr. Priestley.

In the year 1781 he went to Edinburgh with the in-
tention of studying medicine. Of his companions, occupa-
tions, or studies while in Scotland, little is known, except
that he received instruction from Dr. Black; but it
however continued long in that University, for in October
1782, he was admitted a member of Christ's College, Cam-
bridge, where he then began to reside.
In the summer of 1784 he travelled into Denmark and
Sweden, with the intention, partly of examining the
mines of the latter country, but chiefly with the view of
becoming personally acquainted with Scheele, for whom
he had conceived a high degree of admiration, especial-
lly since the publication of his remarkable researches.

In a year or two thenceforward he went to Paris, where he became acquainted with
some of the eminent chemists; thence he went to Holland
and the Netherlands, after having recovered from a serious
illness with which he was seized during his residence in
the French capital.
In January, 1785, he was elected a Fellow of the Royal
Society, and in 1786 he left Christ's College and removed
to Emmanuel College, where he took his degree of
bachelor of physics, and soon after quitted Cambridge and
came to reside in London. In 1796 he took a doctor's de-
gree at Cambridge, but as his fortune was independent,
he relinquished all idea of practice as a physician. In 1813,
he was made full professor of chemistry at the Royal
Society, having in the previous year delivered, with great success, a few lectures on the principles of mineralogy to some of his friends.
In the month of September, 1814, Mr. Tennant went to
the Continent, to reside at Paris and, on his return home on the 28th
of February, 1815, he arrived at Boulogne with honour
in order to embark there. They embarked on the 2d, but
were forced back by the wind, and meant to embark
next day; in the mean time he went, to see Romantte's pillar, about a league
and a half off, and going off the road on their return to look at a small fort,
of which the drawbridge wanted a bolt, they were both
thrown, with their horses, into the ditch. When saved,
Mr. Tennant was severely hurt, but Mr. Tennant's skull was
severely fractured, that he died within an hour after.

The following character of Mr. Tennant is chiefly con-
sidered with some variations, from the Annals of Philosophy,
vi., and the writer of this brief notice, having well
done the subject of it, is satisfied to confine those extracts
in the all the important particulars.
Mr. Tennant was tall and slender in his person, with
this face and light complexion. His appearance, appar-
tioned some singularities of manner, and great repres-
ence of the gentleman, and cost of the court, to which
he belonged. He was of great conversation in the
early years of his life. As a spectator of events he
would often vary in his conclusions, and at favourable
times, when he was in good health, as
still very pleasing. The general cast of his features were
plain, but there was a great deal of intelligence; and
ral persons have been struck with a general simplicity in
his countenance to the well-known portraits of Locke.
His intellectual character, the distinguishing and
primary idea of the whole, was good sense: a prompt and
natural perception of truth, both upon those questions in
which certainty is attainable and those which must be determined
by the nicer results of moral evidence. In quick percep-
tion, united with soundness and accuracy of judgment, it
was perhaps without an equal. He saw immediately
with the utmost clearness of intellect where any philoso-
lay, and upon what points the decision was ultimately to
pend, and he was remarkable for the faculty of stating
merits of an obscure and confused question very clearly
and with great simplicity and precision. The
and tenor, as well as the style of his publications which
deployed on such occasions, were alike admirable; and
omitted to convince the unprejudiced, and to con-
cert or silence his opponents. He had a peculiarity of
uncommon style which was heightened by his own
counterpart, a quiet familiar manner, and a charac-
tristic simplicity of style. In consequence, principally,
of the declining state of his health, his talent for con-
versation was perhaps less uniformly conspicuous than his
of his researches; but at the same time he never failed, when his
exerted himself, to dis-
play his peculiar powers.

The Physical Transact. octs. contain eight pages to
Mr. Tennant. — 1. On the Decomposition of Flax
Surface and Soil.—This state is naturally divided into three regions, which may be called the Eastern or Mountain region, the Middle or Hilly region, and the Western or Level region; and this division is made to correspond with that which is made for the administration of justice, according to which the country is divided into the Eastern, the Middle, and the Western District. The first and the last have nearly equal extent, each comprising about 10,000 square miles, but the Middle District is about double that size.

The Eastern or Mountain Region lies within the ranges of the Appalachian Mountains. This extensive mountain-system is bounded on the east by the boundary-line of Tennessee. Near 35° N. lat. and 82° W. long., on the boundary-line between South and North Carolina, the country forms a ridge of hills, a continuous high ground which extends west to 83° W. long., a distance of more than 160 miles. In the Carolina it is known by the name of the Blue Ridge. It does not terminate at 85° W. long., but west of that meridian it forms a kind of mountain-knot, consisting of several ridges, which extend west and north-west in the direction of the whole mountain-system. These ridges lie between 34° and 35° 20' N. lat., and the Tennessee river traverses this tract in a south-west direction. The highest of these ridges is on the east of the river valley, and is called the Look-out Mountains. The elevation of this ridge just mentioned, is the southern extremity of the Appalachian Mountains; for from its eastern extremity, west of 82° W. long., a ridge runs in a general north-east direction, which is also called the Blue Ridge, being considered as the continuation of the ridge of the Appalachian Mountains. Beyond this termination (near 86° W. long.) there runs another ridge under the name of the Cumberland Mountains, first north-north-east, and afterwards east-north-east and north-east. This ridge extends between the two western valleys to west about 300 miles. It is traversed by several minor ridges, among which the most elevated and least interrupted is called the Iron Mountains. It extends south-west and north-east, is much nearer the eastern Blue Ridge than the western, and constitutes the boundary-line on the east between North Carolina and Tennessee.

The mountain-region of Tennessee occupies the tract enclosed by the Iron Mountains and the Cumberland Mountains, whose most elevated part is about 70 miles distant from one another. The northern half of this tract is traversed by three minor ridges, which in general run parallel to the larger ranges, and thus with the two outer ranges form four valleys, the branches of which traverse the upper branches of the Tennessee River, namely, Powell's, Clinch, Holston, and French Broad River. The valleys are rather wide, but as there is little alluvial land along the watercourses, their surface is uneven and broken, and the soil, which is of silicious gravel, is of little fertility and quality, except in the valleys of the Holston and French Broad rivers, where it contains a mixture of clay. Only a comparatively small portion of it is strong enough for the growth of wheat; the greater part produces rye and oats, but the mountains afford good pasture-grounds, and large herds of cattle and sheep are kept. The most elevated part of the mountains is overgrown with forests of pitch-pine, which yield timber, and from which tar, pitch, and turpentine are extracted. The minor ridges terminate near 35° 30' N. lat., where the upper branches of the Tennessee river form their union. The country south of 35° 50' can only be called mountainous near the southern portion of the Blue Ridge and the Cumberland Mountains, the interior being covered by a succession of hills rising hardly more than 300 feet from their base. The soil of this tract is of indifferent quality, and mostly used as pasture-ground, but the forests contain many large trees, as pitch-pine, red cedar, and black walnut. Along the watercourses there are some tracts of moderate extent fit for the growth of rye and oats.

The Hilly or Middle Region extends from the Cumberland Mountains westward to the Tennessee River, where it traverses the state by running from south to north. The soil is of its nature level. It is covered by a mantle of soil on the sea-level, and it is covered with numerous hills, which form several continuous ridges, such as those which, under the name of Elk Ridge, runs from east to west near 35° 20' N. lat. between the Elk River and Duck River. The watercourses are usually much depressed below the general level.

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and most of them run in narrow channels. This tract varies greatly in fertility. Near the Cumberland Mountains, and to the distance of 20 miles from them, the soil consists chiefly of gravel mixed with limestone, and is of moderate fertility, but in general it is better than in the mountainous region and larger branches are fit for the growth of wheat.

The country west of this tract is the most fertile portion of Tennessee: it extends over the whole of the state from north to south, and reaches westward to 97° W. long. The soil is not inferior to the best part of Kentucky, and consists chiefly of gravel, sand, and gravel. A large quantity of wheat is produced, but the staple articles are tobacco and maize. In the better lands, especially along the Cumberland River, the common crop is maize, and there are 70 bushels of wheat, and in other places 40 or 50. The forests, which still cover a great part of the surface, consist chiefly of ash, elm, black and honey locust, mulberry, sugar-maple, and the wild plum; and wild grapes are abundant. The western districts, or those which lie near the Tennessee River, and extend about 30 miles east of it, are less hilly, but they are also less fertile: they produce the same articles, but the crops are less plentiful. In some places cotton is cultivated.

Western or Level Region lies between the Tennessee and Mississippi. It forms a crescent of flat swells of high ground: the most extensive is that which runs across the state from north to south, about 12 miles from the western bank of the Tennessee River, and is several miles wide. Other swells lie towards the southeastern districts, running from south-east to north-west, and terminating on the banks of the Mississippi with the Chickasaw Bluffs. The north-west districts are nearly a dead level, which descends imperceptibly to the banks of the Mississippi, and in that part more than 1 mile wide, is termed the largest wood-Mississippi, called the Wood Swamp. This region was very thinly inhabited twenty years ago, but it cannot be of indifferent quality, if we judge by the rapidity with which the population has increased. It appears however that the more elevated parts of the country are more settled than the level tract, which may be attributed to the circumstance that the last-mentioned tract contains many swampy places, and is less favourable to health. In these regions, every kind of grain is grown, and cotton and tobacco are extensively cultivated.

Rivers.—Numerous rivers drain this state, and some of them have a long course. The larger rivers are navigable for keel-boats and for steam-boats, but only during the boating season; and steam-boats are fit for the growth of wheat. The Ohio River commences in February, and terminates early in June. Occasional freshets contribute to render them navigable during a short portion of the other months, but no reliance can be placed on periodical returns of freshets, except those of the spring season. The Miami is the largest tributary of the Ohio in the Appalachian Mountains: the most remote of them originate in Virginia near 81° 20' W. long. and 37° N. lat., and run south-west. The largest branches are the Clinch and Jackson rivers: the former unite with other branches which rise in North Carolina, in the country enclosed by the Blue Ridge and the Iron Mountains, and which break through the last-mentioned chain. The largest of them are the French Broad River, the Tennessee, and the Hiawassee. After these numerous branches have united, the Tennessee traverses the mountain-knot between 34° and 35° 20' N. lat. It passes through the ridge, which on the south is called Look-out Mountains, and on the north Walden's Range. It rushes through this gap with great impetuosity over a rock called Look-out Rock: its course is very rapid, but the mountain-tract is very rapid, and it escapes from it by another gap near Port Deposit, in Alabama. At this place it changes the south-west course into a western course, and after draining Alabama for about 100 miles, it returns to Tennessee. In Alabama the river widens from two to three miles, and in this part there are extensive rocky shoals, which are known under the name of the Mussel Shoals, and occupy for seven or eight miles the whole of the bed. It is comparatively shallow all the way to the mouth of the Tennessee.

Clinch. In the boating season it may be ascended by large river-boats to the Mussel Shoals, and even to the gap by which it escapes from the mountains by small boats. Some of its upper branches are navigable for small boats above the Suck. It appears that within the Appalachian Mountains it may be descended by small boats, but the ascent is very laborious and even dangerous.

The Cumberland River rises in Kentucky, in the valley formed by the Cumberland Mountains and the Lane Mountains, and traverses the south-eastern district of the state. The Ohio River, as it is called in Kentucky, 150 miles it turns to the south-west and enters Tennessee, where it soon resumes its western course. It descends through the northern districts of Tennessee by a course of about 22 miles, and reaches Hillsville, in Virginia, and thence to Kentucky, where its general course is to the north. It falls into the Ohio a few miles above the mouth of the Tennessee. This river runs about 450 miles, and as its current is very gentle, the navigation is easy for small boats as far as Nashville, more than 150 miles from its mouth. It is stated to be navigable for river-boats 150 miles alike up, but in Kentucky the upper course is obstructed by extensive shoals in several places.

Climate.—No meteorological observations made in Tennessee have been recorded. We are therefore placed in the dark as to the real nature of the climate. It is very probable, as it is assumed by Darby, that the general level of the Mountain Region is about 900 feet more elevated than the level tracts of the state, and must be much more exposed to the sea. This of course must produce a considerable difference in the climate of the two regions. Cornelia found the vegetation in Virginia, east of the Blue Ridge, two weeks earlier than in the valley west of it. It is probable that the same difference of vegetation continues for half a week, and that the frost is rather severe. In the eastern part of the range the rivers are generally covered with ice for a few days in the winter. Snow falls to the depth of ten inches, but seldom lies more than twelve or fifteen days aginst the end of March, as the country is exposed to much rain and snow; but in the other seasons rain is not frequent, nor does it continue for any length of time. The climate of some parts of Tennessee is remarkable for its dryness. Cattle are accustomed to drink water only at one river, on the mountains of Tennessee. In one part the rain or snow is scarce, and is said to be otherwise than as good in this state as in Georgia. The quantities produced are estimated to be 930,608 lbs. In the other parts the rain is considerable: as that produced in Mississippi (399,283,818 lbs.). In the latter part of the year, the produdion is only as 1 to 2. It is however worth observing that in the part of the state that extends into Georgia (148,907,880 lbs.), and Ohio (134,322,720 lbs.) Tobacco was produced to the amount of 26,040,489 lbs., more than one-third of the quantity grown in Virginia (74,157,841 lbs.). Excess and hemp yielded 45,653 tons, and the meadows only 38,518 tons of hay. Rice is extensively cultivated, as the produce was only 772,816 lbs.: the buck plantations yielded only 840 lbs. The cultivation of the silk worm seems not to have made much progress, as only 1,165 lbs. of cocoons were gathered. The value of the wool was estimated at 396,797 dollars, which proves that horticulture has made considerable progress. A small quantity of wine was made, amounting to 653 gallons. The sugar made from the sugar-cane amounted to 39,741,312 pounds, the produce of 105,337 acres, which is not more than would be expected from the size of the article drawn from the forests. It was considered considerable: the lumber was estimated at 2,092,320 dollars, besides 3,119 barrels of pitch, tar, turpentine and rosin, and 212 tons of pot and pearl ashes. Sheep were also increased, and the number of sheep and goats at the end of 1820 was estimated at 7,733,330, and that of oxen to 7,488,456. The value of the poultry was estimated at 581,531 dollars. The produce of the dairy was to the value of 330,863 dollars. The quantity of wool was 1,023,326 lbs.; and the was 507,780 lbs.

Buffaloes were once numerous, but they have entirely disappeared; the elk and moose-deer are only local.
the Mountain Region, and the deer is still abundant there. There are bears, pumas, wild-cats, and wolves; bears, otters, and musk.-Raccoons, foxes, dire wolves, opossums, rabbits, polecats, and minxes are abundant; pheasants, partridges, pigeons, swans, wild ducks, and geese are abundant. There is fish in the rivers, but not very abundant. The wild trees and underbrush are very prolific and abundant. There is a great variety of fruits, the crab-apple, the wild cherry, and the strawberry.

There is gold in the mountains bordering on North Carolina, but up to 1834 only 12,000 dollars' worth had been collected. Lead exists in the same mountains, but is not utilized for the market. Silver and tin is found on the south side of the Cumberland River, and also at other places. Limestone and marble are quarried in the Cumberland Mountains, and are used to some extent in the Mountain Region. Salt springs are very numerous, and some of them are strong. Some is made, but not to a great amount, as salt is easily obtained from the western districts of Pennsylvania and Ohio.

Population.—In 1836 the Cherokee, who up to that time were in possession of the southern districts of the contain Region, left Tennessee, and went to the west of Mississippi. [Northern American Indians.] At present the population consists of the descendants of Europeans, Chinese, and Indians. By the census of 1820 the population consisted of 422,613 individuals. At the census of 1830 it had increased to 1,054, which gives an increase of 81-3 per cent. in ten years. According to a recent estimate the population is about 829,210, so that in the ten years preceding the census it had increased 21-6 per cent., which is about double the rate of increase in most countries. The increase however has not been equal in different parts. In the Eastern District the increase of the number of slaves amounts to 29-2 per cent., while the proportion of the white inhabitants to the slaves is least in the Eastern District, which contains only 18,714 slaves and 203,971 whites, so that the slaves constitute about one fifth of the white population. In the Middle District there were 301,157 whites and 176,733 slaves, which raises the slave population to 32-4 per cent. of the number of the whites. In the Western District the ratio of whites amounted to 136,059, and that of the slaves to 33,619, or 24-8 per cent. The slaves constituted 41-6 per cent. of the white population.

If the population were equally distributed over the state there would be 20-9 individuals to each square mile. This is the most fertile part of Tennessee, the mountain-region, the most populous. If we allow it 10,000 square miles, which is probably somewhat too much, it contains 212,919 individuals, whilst the Middle District has only 212,919, the Western District only 19-3 individuals to each square mile.

Political Divisions and Towns.—For the administration of justice the state is divided into three districts; and for administrative purposes into fourteen counties. As Tennessee is eminently an agricultural country, none of the states have risen to any importance. The capital is Nashville, built on the left bank of the Cumberland River, at the navigation for large boats begins. It is a town of 65,000 inhabitants; and in 1840, 69,292. Knoxville, on the river, is nearly in the centre of the mountain-region, has a population of about 3000. The other towns are small. The French formerly played the game of ten-pins, which is called the French game of ball called palm-play, or jie de paume. The British have since adopted it, and have added a larger glove, which in some instances was lined, and that afterwards the players bound cords and tendons round their hands to make the ball rebound more forcibly; and hence, it is added, the racket derived its origin. He states that palm-play, or hand-tennis, was exceedingly fashionable

Manufactures.—Manufacturing industry has not made much progress in Tennessee. In 1840 the number of persons employed in manufactures and trades was only 17,605: of whom 10,409 were in the Middle; 3727 in the Eastern; and 2727 in the Western. The number of distilleries was 1381, but all on a small scale, as may be inferred from the produce, which amounted only to 232,406 gallons, of which 56,610 gallons were produced by 3727 distilleries more than 4 millions. Cotton and linen stuffs for clothing are made at home. There is a small number of families who make coarse cotton, linen, and hemp manufactures, also a few ship builders, manufacturers of cordage and ropes. Some bar-iron is made, and nails are manufactured. There are also several small tanneries.

Commerce.—Tennessee is not favourably situated for commerce, as the only river which is navigable for large boats all the year round washes its western extremity. The mountain-region labours under the greatest disadvantages, as the mountains which separate it from the Atlantic regions are difficult to pass. Its commercial wealth consists of live stock: they send their next cattle to Virginia, and their horses, mules, and hogs to the Carolinas. The Middle and Western Districts are commercially connected with New Orleans, to which place they send, by the Mississippi, cotton, tobacco, pork, potatoes, hemp, indigo, musk, bar-iron, and flax. The foreign articles consumed in the country consist mostly of grocery and some other articles of manufacture, imported from Pittsburg and Philadelphia, or from New Orleans.

Education is not neglected. The number of white persons above twenty years of age unable to read and write amounted, in 1840, to 66,532; the number of elementary and common schools was 993, and the number of children attending them 25,090, of which number 6005 were taught at the public expense. The number of academies and grammar-schools was 192, and they were attended by 2818 boys. There are five universities or colleges. The best is the University of Nashville, which has six instructors and a library of about 8600 volumes. Jackson College is near Columbia. The colleges of Greeneville, Washington, and Knoxville are smaller. There is a theological seminary at Maryville in East Tennessee for Presbyterian clergymen.

History and Constitution.—The first settlements in Tennessee were made about the middle of the last century, but in 1780 they were destroyed by the Cherokees, then their possessors of the most southern and central part of which they were expelled in 1790. Since that time the number of settlements has continually and rapidly increased. Up to 1790 Tennessee formed a part of North Carolina, but in that year it was ceded by that state to the United States. In 1796 it was admitted into the Union. The legislative power is vested in a general assembly consisting of a senate and a house of representatives, elected by the freeholders for two years. The senate is at present composed of 25 members, and the house of representatives of 75 members. The executive power is vested in a governor, who is chosen by the electors for the term of two years, and is not capable of holding office more than six years out of eight.

(Tenue, Tour in TENNESSEE. TENNESSEE'S EXPEDITION TO THE ROCKY MOUNTAINS, by James; Darby's Geographical View of the United States; Pitkin's Statistical View of the Commerce of the United States; the American Almanack and Repository of Useful Knowledge for 1842.)

TENNIS, a game in which a ball is driven to and fro by several persons striking it alternately, either with the palm of the hand, naked or covered with a thick glove, or with a small bat or bat-like stick, held in the hand; the aim being to keep the ball in motion without allowing it to fall to the ground. Strutt, on the authority of St. Foix, a French author, states that the French game of ball called palm-play, or jie de paume, is older than the American game. The British added a larger glove, which in some instances was lined, and that afterwards the players bound cords and tendons round their hands to make the ball rebound more forcibly; and hence, it is added, the racket derived its origin. He states that palm-play, or hand-tennis, was exceedingly fashionable

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France during the reign of Charles V., it being often played by the nobility for large sums of money. Perhaps the principal source of the game in England is that which Shakspere has introduced, almost in the words of the old chroniclers, in his 'Henry V.' (act i., sc. 2), where the dauphin sends a present of tennis-balls in answer to Henry's demand for the sovereignty of France. Henry VIII. entered into the game himself; and, according to an Register of his expenditure in the thirteenth year of his reign mentions an item of twelve-pence for his loss at tennis and three-pence for the loss of balls, it may be inferred that the game was played abroad, as the loss of balls is one of the most common and least likely to have happened in a tennis court. Be this as it may, in the sixteenth century tennis-courts were common in England, and the game was very popular with the nobility, which it continued to be down to the reign of Charles II., when it appears that both players and tennis with its couriers. Tennis-courts were divided by a line stretched in the middle, and the players, standing on each side with their rackets in their hands, were required to strike the ball over this line. A similar game was sometimes played with a hollow ball, inflated with air, and called a balloon, which was driven from one player to another by striking with the hand, or with a wooden brace fixed upon the hand and lower arm. Further particulars respecting these and other games played with a ball may be found in Strutt's 'Sports and Pastimes,' and 'Horda-Angel-Cynn.'

TENON, JACQUES-RENE', an eminent French surgeon, whose father also belonged to the medical profession, was born in 1724. He was appointed to the hospital de la Salpêtrière, and in 1741, when he was thirty, and inulin gained him the notice of Winalow, and also of Antoine and Bernard de Jussieu. The first of these celebrated men initiated him in the study of anatomy; the other two developed in him a taste for botany and natural history. The ample and exact knowledge of his contemporaries, Tenon understood that surgery, far from being separated from the other branches of medical science, and restricted to the mere performance of operations, is on the contrary most strictly united to them. Accordingly from this time he bent his whole field of study to the study and treatment of surgical affections minute anatomical investigations and ingenious physiological experiments. In a short time he acquired a well-merited reputation; and though inferior to some other modern French surgeons in skill and genius for that particular department of science, yet few have surpassed him in the extent of his studies and the variety of his information. In 1744 Tenon was appointed to the chair of surgeon to the first class (chierge de première classe aux armes) and served in the following year throughout the campaign in Flanders. On his return to Paris he obtained by competition (au concours) the situation of chief surgeon to the hospital of La Salpêtrière, and in the year 1751 established it as a place for inoculation, a practice which his labours contributed much to propagate. He afterwards became a member of the College and of the Royal Academy of Surgery, and succeeded Andouillé as professor of pathology. In 1777 he was received into the Academy of Sciences.

Tenon belonged to the first Legislative Assembly, and there displayed the same zealous philanthropy which seemed to belong to all his actions. Upon the re-organization of the learned societies, he became a member of the Institute of the first class, and read in that assembly many interesting papers. He was also a member of the Legion of Honour and of several learned and scientific societies, and preserved to the end of his life the same love of labour and the same zeal for the advancement of science which had marked the early years of his career. He died at Paris, on the 15th of January, 1816, at the advanced age of ninety-two. Few persons have written so many memoirs and monographs as Tenon; many of these have only been published after his death. The library of the Institute of Paris contains a collection of the papers written by him, which under the direction of his colleagues is being published (Paris, 1806, 8vo. "Mémoire sur les Hospitiaux de Paris," Paris, 1788, 4to.; a very able memoir, which has served as a model for many that have been since written on the same subject; in which are pointed out almost all the improvements that have been introduced into the French hospitals. His last work, which was published when he was ninety years old, is entitled 'Offrande aux Ville de Paris, et a quelques Moyens pour prolonger la Vie.'

TENOR, the voice of the most common and adult male voices, that which is between the extremes of highest and lowest, or Contratenor [ Alto] and Bass [Voice]. The compass of the Tenor is from c, the second note in the treble, to the second line in the treble. Example, in the tenor clef—

Hence it will be seen that the tenor and treble are relatively at the distance of an octave; consequently, what is calculated for the one voice, as relates to compass, will at the distance of eight notes, inversely suit the other.

The word is derived from Tenor, to hold; for in ancient part-compositions, the plain-song, or air, if it may be so denominated, was given to, or held by, the Tenor. [Clef Tenor-Clef is the c, or mean clef, placed on the fourth line for the use of the tenor voice. Example—

It is also occasionally used for the violincello; and the part of the tenor trombone is written in this clef.

Tenor is also the English name for a larger instrument of the roman tuba, which in Italian music is called Tenorino (Ténor), now Tino, a small island in the Greek Archipelago lying to the south-east of Andros, and between that island and Myconus, and forming one of the group called the Cyclades. S. Nicolò, on its north coast, is in 37° 30' N. lat. and 25° 15' E. long.; it is about 15 miles long, and its greatest length is from north-west to south-east. It was antiently called Hydra because it was well watered (εκοίτησκε) (Bor. Byzant., v. ροδών; Pliny, Hist. Nat., iv. 12), and Ophelos (Strabo, p. 467, ed. Casaubon), invisibly suited in sea. In the time of the Persian invasion of Greece a Texas trireme rendered good service to the Greeks by deserting from the enemy, and giving intelligence of their movement to the allies who were besieging the city of Corinth. The name of the Tenians was in consequence inserted upon the tripod at Delphi in the list of states to whom Greece was indebted for the repulse of the invaders. (Herodot., v. 82.) According to Pausanias (v. 23) the Tenians were among those whose names were inscribed on the state of Jupiter at Olympia, dedicated by the Greeks to fought at Plataea. The island paid tribute to Athens during the Peloponnesian war. (Thucyd., vii. 57.) It was taken, and the inhabitants enslaved by Alexander, tyrant of Pherae, n.c. 362. (Demosith, in Polyol., 1247, Revs. Clinton, Fasti Hellen., n. 362.) In the reign of Tiberius when the Roman senate instituted an inquiry into the rights and privileges attached to temples in the provinces of the empire, the Tenians quoted an oracle of Apollo, by which their state had been consecrated to an altar and temple to Neptune. (Tacitus, Annal., i. 63.) The temple was of considerable size, as appears from Strabo (p. 467), and on the coins of Tenos the image of Neptune is a common type; on the coin there is usually a bunch of grapes. The island is still celebrated for its wines, of which about twenty sorts are grown.

TENREC. Centetes, III.; Centenies, Dezem.; Stere. Geoff. The Tenrecs may be considered—indeed they have been so—by zoologists as the true or chief proceedings of the Institute; he is also said to have left behind him a great number of manuscripts. More than thirty of his works are mentioned in the Biographie Médicale, of which the following are perhaps the most important:—De Cataracta, Paris, 1753; Mémoire sur l'Exhibition des Oes. read before the Academy of Sciences in 1758, 1759, and 1760, and afterwards printed, together with some others, with the title: 'Mémoires sur l'Anatomie, la Pathologie, et la Chirurgie,' Paris, 1806, 8vo. "Mémoire sur les Hospitiaux de
It is in this genus that we first find the jugal bone wanting among the Insectivora.

Geographical Distribution and Habits of the Genus.—Cuvier remarks that three species are found in Madagascar, the first of which, the Tenrec, properly so called, Chrysochloris ecudatus, (Erinaceus, Gmel.) is, he observes, naturalized at the Isle of France.

Mr. Swainson (Classification of Quadrupeds) states that the second division of the family Soricinae, is composed of mole-like animals, apparently connected to the Shrews by the American Scalops and the African Chrysochloris, and that it includes but three genera. (Soreczne, vol. iii., p. 261.) Of the Tenrecs (or Tendrac as he writes the word) he treats as animals peculiar to Madagascar, apparently as capable of domestication as their European congener. *Although inhabiting a warm region,* proceeds Mr. Swainson, *they are said to pass the three warmest months of the year in a state of torpidity: this, it must be owned, is a singular circumstance, and is the only one upon record of an animal hybernating, so to speak, in the height of summer. In other respects they feed like the European Hedgehog, and are nocturnal animals.* The singularity of the circumstance vanishes when we find that the period in which the Tenrec becomes dormant is not only the warm season, but the dry season, and the apparent anomaly becomes another instance of the harmony of adaptation which prevails throughout nature. A suspension of the active powers of life becomes absolutely necessary to insectivorous quadrupeds, because there must be certain seasons when they would find no food. 'Our usual term for the act of retiring, in order to give way to this suspension, is hibernation; because, in our latitudes, this aberration of worms and insects takes place in winter, when our Bats, Hedgehogs, and Shrews lay themselves up till spring returns to call forth their prey. But in Madagascar the dry season is that in which the absence of worms and insects occurs; and then it is that the Tenrec sinks into its half living and half dead state.

Dental Formula:—Incisors $1-1$; canines $1-1$; molars $6-6$.  
$6-6=40$.

Tendrac.

Centetes ecudatus, III.—The Tendrac of Buffon and Zimmernan—is less than the former, and the spines are short and rigid.

Centetes semispinosus is still less, and hardly so large as a common mole. Its body is clothed with a mixture of spines and bristles, and is banded longitudinally with yellow and black.
TENSION (Mechanics), the name given to the force by which a bar or string is pulled, when forming part of any system in equilibrium or in motion. Thus when a weight is supported by a string, the tension of the string is the force which is suspended to it. Every point of the string may be considered as a point of application of two equal and opposite forces, downwards and upwards, each equal to the weight applied.

TENTERDEN, CHARLES ABBOTT, LORD, born at Canterbury, on the 7th of October, 1762, was the son of a barber, who has been described as "a tall, erect, primitive-looking man, with a large club-pitigated going on to the head, as of a做生意, and attended frequently by his son Charles, a youth as decent, grave, and primitive-looking as himself." He was entered in 1769 on the foundation of the king's school of the cathedral, under Dr. Osmond Beauvoir, who is stated by Sir Egerton Brydges to have been an admirable classical scholar, of fine taste, and some genius. Sir Egerton, who for some years held the place next to Abbott in the class, speaks of him as remarkably even in his school-boy days for accuracy, steadiness, and equality of labour; as well acquainted with the rules of grammar, sure in any examination or task, and a tolerably correct writer of Latin verses and prose themes.

In the beginning of 1771 Abbott was elected scholar of Corpus Christi College, Oxford, with an allowance, including his exhibition, of 50l. a year. His mathematical acquirements are said by his friends to have been considerable. In 1784 he obtained the chancellor's medal for his poem, "The Vision of Lupin's ballad," "Globus Aetatonicus." In 1786 his essay "On the Use and Abuse of Satire," obtained the chancellor's medal for the English essay. This essay displays the turn for neat, lucid, and exhaustive arrangement, which was the most marked feature of his mature intellect, and also a good deal of that want of passion and imagination which, perhaps as much as any of his positive qualities, contributed to his judicial eminence. He was elected a fellow of his college, and appointed junior tutor to Mr. (afterwards bishop) Burgesses.

By the advice of Mr. Justice Buller, whose son was one of his private pupils, Abbott entered himself of the Inner Temple in 1788. He also, in compliance with the suggestion of the same experienced lawyer, attended some months the office of the London solicitors Messrs. Sandys and Co. He afterwards became a pupil of Mr. (subsequently Baron Wood); and, aided by his recommendations, began to practise as a special pleader with marked success.

He was called to the bar in Trinity term, 1795.

He married, on the 13th of July, 1795, Mary, eldest daughter of John Logistic Lamotte, Esq., a gentleman of fortune in Kent, which title he afterwards assumed, on the expensiveness of a marriage-settlement. Abbott said he had nothing but an excellent law-library, which the lawyers might tie up as tightly as they pleased.

Having selected the Oxford circuit, he speedily rose into great business. The jealousy of his young rivals gave rise to rumours of his being too courteous to attorneys; but by whatever means he may have obtained his position, he kept it by the preference the leaders evinced for a junior who could often suggest a case in point, and was much behind him in capacity and pretensions. He obtained his appointment, by Sir Vicary Gibbs, when solicitor-general, to the office known among the members of the bar by the name of treasurer-devil, the junior counsel to whose care the business of government is intrusted. In this character he took part in most of the numerous state-trials which occurred about the close of last century. As his character became established, he was appointed standing counsel to the Bank and other great monopolies and companies. When the assessment of the income tax were called for, Mr. Abbott's account was looked upon as a curiosity, both for its minute accuracy and for the largeness of the sum-total of his fees during the past year.

In a sketch of Lord Tenterden, which appeared in the sixtieth volume of the Edinburgh Review," Lord Brougham says of his career at the bar:—"As a leader he was very rarely, and by some extraordinary accident only, appeared; and this in a manner so little satisfactory to himself, that he peremptorily declined it whenever refusal was possible; and he seemed to have no notion of a leader's duty beyond exposing the pleadings and the law of the case to the jury, who could not comprehend them with his explanation. His legal arguments, of which for many years the books are full, were extremely good, without reaching any very high pitch of excellence; they were quite clear, abundantly full of case law; betokening some knowledge of the law, and of principles, and of the felicitous commentary that marked Mr. Holroyd's.

In 1802 Mr. Abbott published his Treatise on the Law relative to Merchant-Ships and Seamen. This work has given the public a good idea of what is coming about with principles of the law; the arrangement was well arranged, and well written: its merits have been repeatedly acknowledged: it is one of the best English law treatises.

In 1818 Mr. Abbott was offered a seat on the bench, but declined from prudential motives, his professional income far exceeding the salary of a judge. As years grew upon him however, and his fortune increased, he began to long for the comparative repose of the bench. In February, 1816, he was offered a seat as puisne judge in the Court of Common Pleas, and accepted it. In May of the same year, on the death of Mr. Justice Le Blanc, he yielded to the importunity of Lord Ellenborough, and was chosen to supply the vacancy in the Court of King's Bench, and was knighted in the same time. In 1816, Sir Charles Abbott succeeded Lord Ellenborough as chief-justice of that court.

It has been alleged that at the outset of his judicial career chief-justice Abbott was apt to lose himself among the difficulties of his office; but he displayed a spirit of great anxiety to make his decisions accord with common sense and substantial justice. Perhaps he showed most in the management of arguments which required a combination of scientific with legal knowledge: 'to see him preside over a complex patent case, was a very great treat, whether to a lawyer or a man of science.' A reasonable distinction, a reasonable interpretation of the law, were his favourite phrases. He was, as every learned and judicious lawyer must be, rather impatient of the check on the capacity of his mind, and was never in temper in command when arguing with the bar. His impartiality, as far as the parties were concerned, was unquestioned. 'It was an edifying sight,' says Lord Brougham, 'to see him preside over a complex patent case, was a very great treat, whether to a lawyer or a man of science.' A reasonable distinction, a reasonable interpretation of the law, were his favourite phrases. He was, as every learned and judicious lawyer must be, rather impatient of the check on the capacity of his mind, and was never in temper in command when arguing with the bar. His impartiality, as far as the parties were concerned, was unquestioned. 'It was an edifying sight,' says Lord Brougham, 'to see him preside over a complex patent case, was a very great treat, whether to a lawyer or a man of science.'
acted in evidence; 1 Will. IV., c. 21, Mandamus and prohibition; 3 Will. IV., c. 22, Interrogatories Act; 1 & 2 Wills. IV., c. 58, Increase in extent of district, and 29, Uniformity of Process Act; 2 & 3 Will. IV., c. 71, Prescription Acts; and (prepared under his sanction) 3 & 4 Will. IV., c. 27, for the limitation of actions and suits and for simplifying the remedies for trying the rights thereof.

As his political opinions were of the kind generally understood to predominate at Oxford, so his literary tastes gained the impress of his University education. When Oxford was black, and he was in the category of 'The Vision of Judgment,' alluded to the poetry of Lord Byron as familiar to the jury, Lord Tenterden could not repress the observation that, for himself, 'there was an air of too severe a school of taste to admire the modern poets.'

The last long vacation were the perusal of the classics, the study of botany, and the composition of Latin verses on flowers and plants. He founded and endowed, in the grammar-school of his native county, two annual prizes; the one, the best English essay, the other for the best Latin verse. In his relaxations, as in the discharge of his public duties, he displayed a mind narrow, it may be, and unaccommodated, but active, dexterous, and elegant.

Several years were occupied with ill-health, and alarm occasioned by the aspect of public affairs. He continued however to discharge assiduously the duties of his high office. He presided for the first two days at the trial of the 'Umbrellas' of July 1832, and conducted the trials in the city at the time of the Reform Bill, in 1831, in which he was confined to bed by a violent attack of inflammation. The disease baffled the skill of his physicians, and he expired on the morning of Sunday, November 4, 1832. Lady Tenterden died on the 19th of December following. He had two sons, one of whom succeeded him in the title, and two daughters.

The materials for this article have been found in a notice of Lord Tenterden in the Obituary of The Gentleman's Magazine, pp. 51-57; in a sketch of the 'Judicial Character of Lord Tenterden' by Mr. Sergeant Talfourd, in the 13th volume of the same work, pp. 294-6; and in a sketch of his character and character by Lord Brougham in the 76th volume of The Edinburgh Review, pp. 14-23. There is a portrait of Lord Tenterden taken by Owen in 1819, and engraved in mezzotinto in a quarto form by S. Lee, in 1832, from a picture by C. G. Henry engraved by H. Meyer. A cast for a bust was taken from his countenance after death.

**TENTHREDO**, a genus of Hymenopterous insects of the section Terebrantia. The genus Tenthredo of Linnaeus is a compensation for Linnaeus, and contains those species which the name Securifera has been applied by Latreille, and Tenthredinidae by Leach. Latreille restricts the generic term Tenthredinidae to those species and increasing in thickness towards the apex. The larvae have from eighteen to twenty-two feet. The genus Tenthredo is however still further restricted by many other authors, and it is especially to Dr. Leach (Zoology of Micronesia, vol. iii. that we are indebted for pointing out distinguishing characters for the subdivisions of the very extensive Linnean genus. By this author the Tenthredinidae are divided chiefly according to the structure of the antennae, and the cells enclosed by the nervation of the wings. According to this classification, the genus contains those species which have the antennae short and clutched at the extremity and the third joint long; the superior wings with two marginal and three submarginal cells. It includes the genera Cimbex, Trichosoma, Olavia, Zarca, Abra, &c.

The species of the second section have the antennae of moderate length, filiform, and composed of three joints; the last joint long, slightly thickened at the extremity, and sometimes bent; one on out of the three contains the genus Hypolota and Schizocerus. The characters of the third section are—antennae short, with nine or ten joints, increasing in thickness in the middle, but ending in a point; the third joint longer than the fourth, the body short and thick, tapering towards the apex. Genera: *Messa*, *Selandria*, and *Penua*.

**Section IV.—Antennae composed of nine joints, moderately long; body moderately long; upper wings with two marginal cells.** To this section belongs the genus Tenthredo of Linnaeus. It is at present represented by many species, but the species with four submarginal cells, and the antennae with the third and fourth joints of equal length. The genus Allantus differs only from Tenthredo in having the third joint of the antennae longer than the fourth. The *Allantus Schroepferi* is a species that occurs in the country, and is found on the scrophulariae, on the leaves of which its larva feed. The perfect insect somewhat resembles a wasp, but is of a rather more slender form; it is also distinguished by the enlarged rings; the legs (with the exception of the thighs) and antennae are also yellow. The larva, which is provided with twenty-two feet, is white and has black dots, and the head is black. When touched it rolls itself up in a spiral manner, as in* Tenthredo.*

**Section V.—Superior wings with but one marginal cell; body short, narrower at the extremity in the males; antennae simple, nine-jointed, slightly dilated, increasing in thickness in the middle, and decreasing at the extremity.** This section contains the genera *Creusa*, *Nematus*, and *Cladius*, examples of which are found in this country.

**Section VI.—Antennae with ten joints; body rather dilated; wings with three marginal and three submarginal cells.** British genera *Tarsa*, *Lyda*, and *Lophurus*. The larva of the species of *Lophurus* live in society, more particularly on the pines, and are said to be very injurious to young plants. The species of this genus are very rare in England. The males live in cells, which the males are provided with a double series of denticles.

**TENTHUS** are a sixth part of the yearly value of all ecclesiastical livings. They were formerly claimed by the pope as due to himself by divine right, after the example of the Jewish high-priest who had of the Levites a tenth part of the tithe; and his claim was sanctioned, in this country, by an ordinance in the 20th year of Edward I, to the value of 10s. The pope might know the amount of his revenue from this source. The possessions afterwards acquired by the church were not liable to the payment of tenths to the pope, as all livings continued to be charged according to that valuation. (Coke, 2 Inst. 627.) When the authority of the pope was extinguished at the Reformation, Henry VIII. transferred the revenue arising from tenths to the crown, and had a new valuation of all the livings, so as to obtain a third tenth of the annual income. (3 Hen. VIII., c. 3, s. 9-11.) By royal grants under 1 Eliz., c. 19, s. 2, the Archbishop of Canterbury and the Bishop of London were exempted from tenths and were also authorized to receive the tenths of several benefices as a temporary loan with intent that the income of each benefice should arise from their sees. By the 6 Anne, c. 24, all benefices were discharged from the payment of tenths which, at that time, were under the annual value of 50l., except those of which the tenths had previously been granted by the crown to other parties. There are also some other special exemptions. At the present time, out of 10,496 benefices, with and without cure of souls, there are 4838 which remain liable to tenths. (Parl. Rep. First-Fruits and Tenths, 1587, No. 384.) Queen Anne gave up the revenue arising from tenths, as well as from first-fruits, which had been enjoyed by her predecessors since the Reformation, and by act 2 and 3 of her reign, c. 11, assigned it to the augmentation of parishes and for which one part in six were appropriated to the funds, called the Governors of Queen Anne's Bounty. This act declared that Episcopal sees and livings not exempted should continue to pay in such rates and proportions only as her predecessors, or according to the valuation of Henry VIII., commonly known as *The King's Books.* Tenths under the act 1 Vict., c. 20, are collected by the Treasurer of the Governors of Queen Anne's Bounty. Payment is enforced by Escheat or fines, which may extend to the whole of the annual income, and the time limited to give notice of arrears within one month after the proper time of payment. In case of a living being vacated, the Escheater is empowered by act 20 Hen. VIII., c. 3, s. 18, to recover arrears of tenths, not only from the executors, but also from the successor of the last incumbent. (2 Burn's Ecclesiastical Law, 9th ed. pp. 273-293.) [First-Fruits, Taxatio Ecclesiastica; Title.]
TENTZEL, or Tenzel, Wilhem Ernest, a German
historian and antiquarian, was born in 1659, at Greus-
see in Thuringia, where his father was pastor. After
the completion of his school education he went, at the age of
eighteen, to the university of Wittenberg, where he chiefly
devoted himself to the study of the antient and Oriental
languages in connection with history. In 1685 he was
appointed teacher at the gymnasium of Gotha, and was at
this period much engaged with the collection of num-

nathyra, Temm.); Trochilus, Linn. (dividing the genera
into the Humming-birds properly so called, or Calidris,
Trochilus, Lasep.; and the Oscines-Motmches, or Fly-birds,
Orthornis, Lasep.; the genera Pregillus, Cuv.; the Hoopes properly so called,
Upupa, Promeropa; and Epimicus).

Mr. Vigors, after pointing out the place of one group
of the Linnaean Certithe which clumb and feed on small
insects, as the Tenuirostre family, and describing
the Collector Birds as the most interesting group
He remarks that the aberrant families of the
order are so numerous in their forms and the
habitato have been so unsatisfactorily characterized, that
it is impossible to speak of them with that certainty which
must be the observations on better defined groups. The genus Prom-

ices to him to be that form of the present tribe
which approaches nearest to the adjoining tribe of Fisc-

nies, or 'The Tenurostre, Promeropa,' exhibits somewhat of
the broad base of the bill of the Fissirostre, and, at the same
time, the gressorial feet. By means of Merops, he remarks
the curved bill of which approaches the structure of
its own, it appears to be immediately connected with that
of a Crecep, and, as such, it is most likely, that the first
appellation from M. Brison's above-mentioned genus,
continues Mr. Vigors, 'I can say nothing at present, but
I do wish to enter into more than a general reference to
the succeeding family of Melaphydse.' (See the article

The families admitted by Mr. Vigors into this tribe of
Insectes be will be found in the article Scinlbe, &c.

Mr. Swainson (to whose publication on this order, in the
1st vol. of the 'Zoological Journal,' which appeared after
the paper On the Natural Affinities that connect the
Orders and Families of Birds was sent to press. Mr. Vigors
refers), in his tenth chapter of the second volume of "
Classification of Birds, remarks, that the most abstract
division of the inessential order is that of the Tenurostre
or honesuckers, so called from the great majority
of the subsistence both from insects and the nectar of flowers
which they suck up by means of a long or filamental
the tongue adapted for that purpose. In these birds,
Mr. Swainson in continuation, are further removed from
the types of their order, they consequently show a great
affinity to the Scitores on one hand, and to the Fis-

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In Mr. G. R. Gray's "List of the Genera of Birds" (2nd edition, 1861), a work remarkable for its accuracy and the vastness of condensed labour which it contains, the Ten- 

nure or the right of the lord is a seigniory. This includes the word "tenant," the office of tenant, and the right of the lord in the tenement. As already observed, all land is held either mediately or immediately of the king; and ultimately all land is held of the king. The ownership of land in England is therefore never unlimited as to extent, for he who is the owner of land in fee, which is the largest estate that a man can have in land, is not absolute owner: he owes services in respect of his fee (or fief), and the seigniory service of knight service is a very limited and restricted form of tenure.
of the lord always subsists. This seignory is now of less value than it was, but still it subsists. The nature of the office of parson of the tenant had nothing to do with the use of the land, and the ownership remained in the lord; and this is still the case. The owner of a fee has in fact a more profitable estate than he once had; but he still owes services, fealty at least, and the ownership of the land is really in the lord, for his successor. For the practical purpose of the owner the power of enjoyment is as complete as if his land were alloidal, but the circumstance of its not being alloidal has several important practical consequences.

No land in England can be held by tenant in chief. If the lord of the fee of lands died without heirs, and without disposing of his fee by will, the lord takes the land by virtue of his seignory. If land is aliened to a person who has a capacity to acquire but not to hold land in England, the land is the land; though some persons in the landlord's lands being sold to an alien. The forfeiture of lands to the king for high treason and to the lord in cases of petty treason and murder are also consequences of tenure.

The case of church lands seems somewhat peculiar. They are held by tenures, though no temporal services are due. This tenure was originally the tenure in frankalmoigne. By the tenure in frankalmoigne the tenant was bound to make orisons, prayers, masses, and other divine services for the soul of his great lord, &c. (Litt., s. 37, 216) the land did not fealty. If land was held for certain divine service certain to be done, &c. (Litt., s. 137), the lord might distrain, and in this case it seemed the lord might have fealty; this tenure by certain religious services is the tenancy by divine service. Coke, in his 'Commentary on Littleton' (96, 6) observes, 'for this divine service certain the lord hath his remedy, as it here appears by our author, in foro securi; for here it appears that if the lord distrains for divine service, the lands is certain that shall upon his avowry recover damages at the common law, that is, in the king's temporal court, for the not doing of it.'

The Act which abolished military tenures could not from its terms affect tenure in frankalmoigne; but for greater caution it was declared that this act should not subject tenures in frankalmoigne to any greater or other services. Tenure in frankalmoigne therefore is now exactly what it was before the 12th of Charles II. was passed. Church lands then, which are held in frankalmoigne, still owe no services; but the lord of whom they are held must be considered the owner. And this conclusion is consistent with and part of the law of tenure, by which no land is held ever without a tenant. It differs from land held by laymen in this, that the beneficial ownership can never revert to the lord, for all spiritual persons are of the nature of corporations, and when a parson dies, the corporation sole (as he is termed by an old writer) continues, is distinct, and is the duty and right of some definite person to name a successor. It is stated by Blackstone (i. 470) that 'the law has wisely ordained that the parson, quaedam parson, shall never die any more than the king, by making him to his successor a corporation; by which means all the original rights of the patronage are preserved entire to the successor: for the present incumbent and his predecessors who lived seven centuries ago, are in law one and the same person.' But notwithstanding this ingenious attempt to make a man, together with others not ascertained, a corporation, the difficulty really is, that when a parson dies, there is no person who has a legal ownership of the land until a successor is appointed. It is the same as the theory is true. The law is to the effect of the case of a parson without that the king is unapt, for the successor to a deceased king is ascertained by the death of his predecessor; but the successor of a parson is generally ascertained by the death of some other person being exercised, and the person entitled to appoint a parson has named one, and he has been duly instituted, the lands of the church have no legal owner, unless the lord is the owner. This seignory may be worth nothing, but it still exists. This difficulty may indeed be cleared up by the invention of a seignory still existing, and in the following manner. There is succession in the case of one parson succeeding another, for which the notion of a corporation is not necessary. The notion of succession is this: the right which is the object of the succession, continues to the subject, that is, the person, changes. In order to constitute strict succession, the new owner must have the same title as the former owner.

The nature of tenure as it exists at present will be
TEPHROSIA (from τεφρός, ash-coloured), the name of a genus of plants belonging to the papilionaceous division of the order Leguminosae. The genus consists of shrubs or herbs, with usually unequally pinnaed leaves, and lanceolate or subulate stipules distinct from the petiole. The flowers are white or purplish, arranged in racemes which are mostly axillary. The calyx is without bracts, 5-toothed, nearly equal; vexillum of corolla large, silky outwa...
three pairs; the legume is 6- or 7-seeded, and rather pubescent. It is a native of Egypt, and yields a blue colouring-matter which is used in dyeing.

*Senna*, Buga Senna, is a glabrous shrub, with leaves having six pairs of leaflets, and the legumes and calyces covered with pubescence. It grows on the banks of the river Cavo, near Buga, in the province of Perugia. Its leaves are used as a purgative quality like *senna*, and are used by the natives for the same purposes as that plant is used.

In the cultivation of these plants a mixture of loam and peat should be employed. They may be raised from seeds, or by young plantings planted in sand, and covered with a bell-glass. Some of the species require the heat of a stove.

**TEPLITZ**. [MORAVIAN STATES,]

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**TER**. [MORAVIAN STATES,]

**TERAMO, PROVINCIA DI**, called also **AQUILA**, is an administrative division of the Abruzzi and Molise, of the kingdom of Naples, stretching east of the great Apennine ridge, and sloping down to the Adriatic sea. It is bounded on the east by the Adriatic, north by the Papal province of Fermo and Ascoli, west by the Neapolitan province of Lanciano, and south by the province of *Aquila*. Its limits are the Tronto, which marks the boundary between the Papal State, the Tordino, which flows by the town of *Teramo*, and the Vomano, whose several sources flow from the mountains of Sasso d'Anna, and so join with the *Aquila*, occupying great part of the area of both. The river Pescara, in its lower course, marks the boundary between the province of *Teramo* and that of Chieti.

The province of *Teramo* is divided into two administrative districts, *Teramo* and *Penne*, containing seventy-five parishes, the whole population amounted in 1861 to 200,719 inhabitants. (Serratori, Statistiche d'Italia.) The area is estimated at about 1000 square miles. Most of the population are employed in agriculture. There are several manufactories of silk and delft ware, liquorice, paper, and tobacco. The town of *Teramo* is a centre of production of several churches and convents, and about 8000 inhabitants.

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portraits, conversations, persons engaged at different games, performers on musical instruments, ladies at their toilettes. He finished his pictures highly, with a light and delicate touch, and is remarkable for introducing white satin in the desire of some figure in all his compositions: he always looks as if the picture had seized upon it, and seems never to have painted a picture without considerable care of the colours he exerts all others; but none can be compared with him in the enchanting harmony and silvery tone, and the observance of the aerial perspective. His figures, which are well drawn, have an uncommon ease of refinement, and a particular grace of expression. His capital works are in England, in the collections of Sir Robert Peel, the duke of Sutherland, Lord Ashburton, Mr. Hope, the marquess of Bute, and Her Majesty. (Pilking

TERCEIRA is considered the principal island of the Azores or Western Islands, though it is neither the largest nor the most fertile. It is situated nearly in the centre of the group, and it is the seat of government. It extends between latitudes 36° and 37° 22' W. long., and is about 20 miles long from east to west, with an average width of about 13 miles. This gives an area of 200 square miles, or about 60 square miles more than the smallest of the English counties, Rutlandshire. The island of England and Holland is about the same size. The eastern coast of Santa Maria, has probably been produced by volcanic action, but its surface does not exhibit that extreme irregularity which occurs in the other islands, and in general conforms, with respect to that agency. The coasts indeed are rocky and precipitous, but some parts of the island are chiefly composed of beautiful and penetrable fertile plains, and entirely destitute of the numerous cones, craters, and peaks which distinguish the island of St. Michael. Along the west, and the north, and the south, and the east, which however probably does not exceed 3000 feet above the sea-level. The elevated rocky coast along the western and northern shores cannot be approached without great difficulties, is lined with lava, and the sea-beach which is in many places from 10 to 75 feet, and rarely exceeds these two extremes. But the weather is nevertheless subject to great changes, and is only settled between the summer solstice and the annual equinox. Showers of rain are frequent throughout the year, and in winter so violent as to cause constant changes in the face of the country, washing away enormous masses of pumice-stone from the mountains, throwing down projecting portions of the rocks composed of soft volcanic materials, and leaving the surface of the rocks and adjacent land destitute. Many of these eruptions are estimated at about 200, and the

wet ones at sixty. The sea, which surrounds the Azores is remarkable for the incessant gusts and gales to which it is subject, on which account it is rather dreaded by seamen. This phenomenon is probably connected with the Gulf-stream, which reaches the most western islands (Flores and Corvo), and frequently expels over the large group. All the navigators have noticed the frequent occurrence of these sudden squalls, especially along the northern edge of the Gulf-stream. The prevailing winds during the winter range between north-west and south-west; the south-west generally blows in strong gales, and is attended by heavy rains. During the summer the most frequent are northerly, north-easterly, and easterly winds; but at all seasons the changes of the winds are frequent and sudden, and render the navigation between the islands very tedious. The soil being more suitable to agriculture and pasturage than to the cultivation of fruit, grain and cattle are the staple articles. The principal objects of cultivation are wheat, Indian corn, flax, French and broad beans, and a little barley. The yearly produce of the grain is stated to be 720,000 bushels, and some is exported to Lisbon, Oporto, and Madeira. The most common vegetables are yams, potatoes, sweet potatoes, onions, and capiscums. All the fruit-trees of both islands have been carefully and systematically cultivated. All the principal works are in England, in the collections of Sir Robert Peel, the duke of Sutherland, Lord Ashburton, Mr. Hope, the marquess of Bute, and Her Majesty. (Pilking

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TEREBELLA. [TURCIOLIDA.] (N.B. This comes too near to Terebellum.)

TEREBELLA'RIA, a genus of Polyplacina, included by Blainville in the family of Milleporens.

TEREBELLUM, Lamarck's name for a genus of testaceous mollusks, placed by Cuvier among his Pectinibranchiata Gastropods, between Ovula and Voluta; by De Blainville among his Angiostomata, between Conus and Ostrea; and by Bang between Mitra and Ancillaria.

The fossil Terebellum convolutum is the type of Montfort's genus Serrata.

Generic Character.—Animal?

Shell delicate, polished, subcylinrical, rolled upon itself; the apex pointed; the aperture longitudinal and triangular, very narrow behind and obtuse before; edge of the right lip simple and truncate; columnellar border smooth, truncated, and slightly prolonged forwards.

There appears to be but one recent species known, Terebellum substantum.

De Blainville divides the genus into two sections:—

A. Species whose spire is visible, and whose aperture is shorter than the shell. (Terebellum.)

B. Species whose spire is nearly entirely hid by the rolling up of the whorls of the spire, and whose aperture is nearly as long as the shell. (Serrata, fossil.)

Example. Terebellum substantum.

Description.—Shell subulate-cylindrical, rather thin, smooth, and polished; the spire distinct; the outer lip attached to the columnella.

There are at least four varieties:—

A. Clouded with chestnut, quadrifasciate, or with the colour in patches.

B. Ornamented with flexuous subspiral or transversely oblique chestnut lines.

C. Thickly dotted with rich chestnut.

D. Entirely white.

Locality.—The East Indies.

Terebellum substantum. (Genus Serrata of Montfort.)

Terebellum convolutum. (Genus Serrata of Montfort.)

TEREBINTACEAE, a natural order of dicotyledonous plants. They are trees or shrubs, abounding in rainy or gummy, caustic, poisonous, and sometimes milky parts. The leaves are alternate and simple, ternate, or pinnate. The flowers are terminal or axillary, mostly unisexual. The calyx is small. The petals and stamens are equal in number to the divisions of the calyx; sometimes the stamens are twice the number; the disk is fleshy; ovary simple; fruit indehiscent, with a single exalbuminous seed.

This order was constituted by Jussieu, and is adopted by De Candolle, Arnott, Don, and other writers on systematic botany. Brown has however constructed from this, viz., Anacardiaceae, Birracaceae, Convolvulaceae, and Amygdaleae. These orders have been recognised by Kunth, Lindley, and others; and their characters and properties are given in this work under the respective names. [Anacardiaceae; Bixaceae; Spondanaceae; Amygdaleae; Terebida.]

TEREBIDA. [ENTOMOSTOMATA, vol. ix., p. 451.]

TEREBIDALIA, Mr. Swainson's name for a genus of testaceous Gastropods, arranged by him under the Littorina, the fifth subfamily of his Strombid, of which he characterized:—

Outer lip much dilated, generally uniting at its base with the inner lip, leaving a round perforation at the base of the pillar; channel truncate, operculum round.

Mr. Swainson places the genus between Pireo [Ceramacea] and Rhinocliva, Sw.; and, among other species, he refers to Terebralia Terebratulum, Certusium Terebra, etc., of authors. [ENTOMOSTOMATA, vol. ix., p. 451.]

Whatever may be thought of this genus, the name for its coming so near to Terebra, may produce confusion. The reason for not admitting Pirea as a genus was found in the article Melanopsis. (TEREBRATULAT.)

TEREDINA, a testaceous mollusk of the family Terebridae of Lamarck, and belonging to the Adscendens of De Blainville.

Generic Character.—Valves equal, but inequal; umbones prominent; when closed, orb-like with a semicircular opening in front, and a subcircular aperture behind. Tube testaceous, subcylindrical, with a termi- nal posterior extremity, without any septum, unite at the posterior part of the two valves.

This genus is fossil only. Lamarck places it between Septaria [Terebida] and Tereba; Cuvier between Terebra and Clavagella.

Mr. Swainson arranges it in his family Phoideidae, which makes it a subgenus of Tereba.

Mr. J. E. Gray places Terebrina among the Phoideidae between Jovannetia and Tereba.

Mr. Deshayes, in the last edition of Lamarck, states that this curious genus was not well known to the zoologist. The Terebrina, M. Deshayes remarks, is a sub
globular Pholas fixed at the end of a tube, and has in fact the exterior characters of the Pholades. It carries an escutcheon on the umbones, and within it is provided with three appendages which so readily distinguish the Teredo from other genera. The shell is always external, and soldered by the posterior extremity of its valves to the anterior part of the tube, which is very thick and terminated by a blackish part of a horrid appearance, whose internal surface is sometimes divided into eight regular carinations.

M. Deshayes, in his Tables, gives two species, Teredina permatua and a new species, both from the tertiary beds (ocene of Lyell). In the last edition of Lamarck no notice is taken of the new species, and to the second species, Teredina bacillum, recorded by Lamarck, is appended a note stating that this last does not belong to the genus Teredina; and that, according to the description and figure of Brocchi, it can only be a Clavagella or a Fistulana; but that it is not Clavagellæ tubiæ, as M. De Blainville believed.

Teredina permatua. (Courtaud, &c.)

| b. tube with valves; | c. the other termination of the tube; | d. spongy valve; | e. valves with accessory valve in its place. |

TEREDO, the name given by Linneus to a genus of testaceous mollusks, highly interesting on account of the ravages which one of the species commits upon submerged wood.

Linneus, in the twelfth edition of the 'Systema Naturae,' placed the genus among his Verræ testacea, between Serpula and Sabella: nor is this certainly inapt position to be wondered at when we consider the very infant state of malacology in his day.

Cuvier, in his last edition of the "Règne Animal," makes Teredo one of the genera of his Envermés, the fifth family of his Acéphalous Testacea, arranging the genera between Pholus and Fistulana.

M. de Blainville arranges the genus in the tenth family (Ademacæa) of his Pyloridians, between Teredina and Fistulana, immediately after which comes Septaria.

Lamarck placed the genus among his Tubicidès, and M. Rang adopts that arrangement, giving it a position however between Jouannetia and Fistulana, next to which, and immediately before Teredina, Septaria appears.

Lamarck ended with this genus his Tubicidès, which are immediately followed by the Pholadaires. Teredo is immediately preceded by Teredina, and this again by Septaria. In speaking of the last-named genus, M. Deshayes, in the last edition of Lamarck, observes that although the animal and the shell of Septaria are not known to him, the great portions of its testacea tube or sheath, which he had seen, convinced him that the animal is analogous to that of Fistulana, which differs from it principally in size only; and because its two anterior siphons are very long, and form for themselves each a particular testaceous sheath. The animal sought therefore to have posteriorly, he remarks, a bivalve shell, which had escaped those who have collected the great tube, or the portions of it which we see in cabinets. M. Deshayes goes on to state that he had only seen for Septaria, unequally distant and entirely incomplete. Some Fistulana, he adds, have also vaulted septa in the posterior part of their sheath; but the diminished or anterior part of this offers only particular tubes projecting outwards (1835).

Again, when Lamarck concludes his observations by saying that, for the rest, the Septaria is hardly anything but an exaggerated Fistulana, and scarcely deserves to be distinguished as a genus, M. Deshayes declares that if we substitute for the word Fistulana the more correct remarks would be perfectly just. This genus, he adds (Lamarck's Septaria), which had been believed to be peculiar to the seas of India, has been found some years since in the Mediterranean; and he refers to the paper published on that animal in the 'Annales des Sciences et de l'Industrie du Midi de la France,' Marseille, 1832, by M. Mathéron, in which that naturalist proves the animal of Septaria to be similar to that of Teredo; and this resemblance, says M. Deshayes, in conclusion, confirms his own opinion of the necessity of uniting the Septaria and the Teredina.

Mr. Swainson (Malacology, 1840) places Teredo with the subgenera Teredo and Teredina, at the end of the 'Pholades.'

Mr. J. E. Gray arranges Teredo between Ternea and Bankia, under his Pholades, the first family of his second order (Cladopoda) of Conchifera. Septaria is introduced, with a query, into his second family, Gastrocochæidae.

ORGANIZATION.

It is now 36 years since Sir Everard (then Mr.) Home laid before the Royal Society, with the assistance of Mr. Clift in making the drawings, and the aid of Sir Benjamin (then Mr.) Brodie, his Observations on the Shell of the Sea-Worm found on the Coast of Sumatra, proving it to belong to a Species of Teredo, with an account of the Anatomy of the Teredo Navalis. Sir Everard remarks that the internal structure and economy of Teredo navalis is so little known, and so much of what was said of them by Sellius was so vague, that it became necessary to acquire an accurate knowledge of the common Teredo navalis, before any adequate idea could be formed of the new species, which he names Teredo gigantica.

On examining the shell of Teredo navalis while in the wood, Sir Everard found its external orifice very small, just large enough, in fact, to give a passage to the two small tubes. The greatest thickness observed was 3⁄16 of an inch. The canal extended for 1 inch in length, was not lined with shell, but smeared over with a dirty green-coloured mucus, which was also spread upon the last-formed portion of shell. According to Mr. Hatchetti's analysis, the shell of Teredo navalis is perfectly similar to that of Teredo gigantica, being devoid of phosphate of lime, and composed of 97 parts of carbonate of lime and 3 of animal matter.

While the animal was in the shell alive and undisturbed, what is termed the head was in contact with the end of the canal in the wood; but, on laying the head bare, it was drawn in for an inch into the shell. The body of the animal filled the area of the shell completely, but appeared much smaller when taken out, in consequence of the sea-water which it contained escaping. The largest of the worms examined were of different lengths measured 8 inches in length. Many of them were alive 24 hours after being removed from their shell, and in these the heart was seen to palpitate. The blood in the vessels going to the head was red, as also the parts near the liver; but this colour disappeared soon after death.

The head of the worm was enclosed between the two concave boring shells, so that what Sir Everard calls the head was the only part exposed. The head is the part altogether on what is termed the back part of the head by a very strong digastric muscle, having a middle tendon from which the fibres go off in a somewhat radiated direction, partly to increase the surface of the head, and partly into a long semicircular process projecting from the posterior part of each shell. The two incline the osophagus and other parts surrounding it. The double muscle was inclosed in a smooth shining fascia. When first exposed it was of a bright red.
On the opposite side of the head the shells were united by a ligament from which they were readily separated; at this part were two small tooth-like processes, one from the narrow edge of each shell, where they were joined together.

From the middle of the exposed part of the head projected a kind of proboscis; which in the living animal had a vermicular motion: its extremity was covered by a cutaneous tube of the same nature as above. On removing this, the cavity immediately beneath it was found to contain a brown-coloured gelatinous substance, like a Florence flask, with the large end uppermost in form. Sir Everard remarks that as this proboscis has no orifice, there is reason to think that it adheres to the anal orifice, and excreta are deposited there.

The mouth was nearly concealed by the projection of the proboscis, but, when exposed, presented a very distinct ring of muscle between the proboscis and the large digestive muscle.

'The body of the worm,' proceeds Sir Everard, 'is inclosed in one general covering, extending from the base of the boring shell, with which it is firmly connected to the root of the two small tubes, which appear out of the wood. It terminates in a small double fold forming a cup, on the inside of which are fixed the long small stems of two opercula, which become broad and flat towards their outer extremity. These, when brought together, slant the shell, and inclose the two contracted tubes within it; not one operculum corresponding to each tube, but in a transverse direction. In the Teredo gigantea, the opercula are more distant, each having its own operculum, and differing in length. At the base of this cup the general covering is thick and ligamentous, for about one-fourth of an inch in length, where the stems of the opercula are connected with it; and at one spot of this thickened part there is an adhesion to the cylindrical shell, which is the only part of the animal connected with it. There is a depression in the shell pointing out this spot. The double fold of the outer covering, that forms the cup, contains the sphincter muscle, which closes the orifice by bringing the opercula together. The general covering is composed of two membranes, the outer strongest, and made up of circular fibres, the inner much finer, having no fibrous structure. On the back of the animal, this covering is firmly connected to the parts underneath, and is therefore strongest. On the belly it forms a cavity, and is thinner. It is everywhere sufficiently transparent to show the different viscera through it.'

Sir Everard Home begins his section by dividing this covering into two parts, each with a posterior orifice, the former to be less natural openings: one, that of the largest of the above-described tubes, by which it receives the water from the sea; the other, a transverse slit under the union of the boring shells, one-quarter of an inch long, opening into the anterior part of the mouth. The anterior tube has no communication with this cavity, and that there is none between this cavity and that of the belly, the viscera having a proper covering of their own: the breathing organs however, which are attached on the posterior surface of this cavity, are described as having their fringed edge loose and exposed to the influence of the salt water; so that the larger tube is constantly applying salt water to them, and conveying it to the animal's mouth through the anterior tube for the same purpose.

'Digestive System.'—The head and abdominal viscera were found to occupy about one-third of the animal's length, the breathing organs another third, and the space between their termination and the ends of the small tubes the remainder. The two large tubes was very short, lying on the left side of the neck. On the right were two large approximated glands connected with its coat. The osophagus gradually swelling out became stomach, which extended from the head to the lower end of the abdomen near the middle of the length of the abdomen; the intestine commenced close to the termination of the osophagus; but when the stomach was laid open, a septum appeared dividing it into two distinct bags, except at the lower end, where they communicate with each other. The stomachs were found double on itself. In those worms which were examined alive, the stomachs were quite empty; but in some preserved specimens the contents were a yellow-coloured pulp, of which we shall have to say more presently: the quantity in a specimen from the British Museum was about 10 grains.

The intestine was very small, and became dilated into a cavity containing a hard, white globular body, of the size of a large pin's head, and then made a turn upon itself. Here the liver is attached to the stomach, to which it firmly adheres. The gut passed forwards till it reached the lower end of the stomach, opposite the septum, and continued a short distance between the stomach and the end and up again on the opposite side. It was then continued on one side of the esophagus nearly as high as stomach, where it was reflected over the middle tendon: the digestive muscle of the boring shells, and no intestine were in the line of the body, except it passed through the small intestine, though its contents are emptied.

'Humans and Respiratory System.'—The heart was found in the middle between the mouth and the lower end of the body, and was divided into two chambers, one on each side. There were two auricles, composed of a thick brown-coloured membrane, which opened by contracted valves orifices into two white strong tubes, which united to the ventricle. This ventricle, Sir Everard observes, 'was to be continued into a branch of the brain, which supplies the viscera, and ascends to the muscles of the two boring shells. The heart was very loosely connected to the surrounding parts; its action was distinctly seen through the external covering, and was observed, in some instances after it had been cut open and examined, to shut two auricles, which shortened themselves in that action. A swelling of the ventricle, followed by a contraction, thus produced. Sir Everard found that the artery between the heart and the tubes was of the nature of two auricles, and that the shell was of a red colour, as well as the liver, and one-third of the surrounding parts between the heart and the body. One side of the heart contained only of a single circulation, as in other animals where the blood passes directly from the heart to the different parts of the body, and returns through the vessels of the breathing organs. The other side of the heart was only two tubes to the orifice of the breathing organ, which in fishes it goes first to the breathing organs, and then to the different parts of the body. This peculiar circulation, he adds, becomes a link in the gradation of modes of exposing the blood to the air in different classes of animals; and it furnishes an instance of how the exposure to the air is carried on more slowly, but in a more perfect way than in caterpillars.

'Brain and Nervous System.'—Sir Everard doubt not the existence of the brain and nerves in animals so perfectly constructed as the Teredos, and Teredines, but he failed to detect them during his investigation.

'Generative System.'—Sir Everard Home describes the testicles as two long glandular substances, one on each side of the stomach, of a whitish colour and granulated structure. From each of them a duct passed to the orifice which lay between the two breathing organs. The duct ran upon their outer edge, and terminated near the base of the small tube. In this way, he remarks, the eggs are impregnated before they pass out at that orifice. It was also taken from a specimen which was examined in February, the testicles were small, and no appearance of ovaria could be seen; but in specimens from the Hunterian Museum the testicles were much fuller, and the ovaria formed two large tubes, with lining of the eggs. These, when examined under the microscope, were seen to contain innumerable eggs. When the ovaria are empty, Sir Everard states that there is nothing to be found between the two breathing organs but the two small black seminal vesicles, which, as the Teredo variegata has its ovaria full of eggs in the spring and summer; that they are met with as late as December, and that these individuals which he examined in February had their ovaria full of eggs, and that the Teredo variegata ever bore eggs with full or empty ovaria.

With regard to Teredo gigantea, the same author observes that, when arrived at its full growth, it closes over the end of its shell, and so does Teredo navalis. Sir Everard believed that the animal by this act formed its own tomb.
since it could no longer destroy the wood in which it was contained. Sir Everard, however remarks that in *Teredo gigantea* death is brought about by the permeation of the substance in which it is imbedded. In some of Mr. Grif-fiths's specimens the shell was just covered in, and the part close to the termination extremely thin, whilst in others it was increased twenty-fold in thickness. In others again the shell had not only become thick, but the animal had receded from its first inclosure, and had formed a second three inches up the tube, and afterwards a third two inches further on, and had made the sides thicker and thicker, so as to diminish the canal in proportion to the diminution of its own size.

**Animal of *Teredo navalis* out of the shell.**

a. the opercula are wanting, and the tubes retracted. b. the opercula in their station, and the tubes protruded. c. a, the lining-shells; c, the proboscis; d, e, the mouth; f, g, the contents of the animal seen through the transparent external covering; e, f, breathing organs seen in the same way. (Phil. Trans.)

Sir Everard considers these facts as proving that *Teredo gigantea*, when arrived at its full growth, or whenever it is prevented from increasing in length, closes up the end of its shell, and lives a long time afterwards, furnished with food from the sea-water. *Teredo navalis*, he observes, closes up its shell in the same manner: it must therefore, after that period, be supplied with food entirely through the medium of sea-water. The *Teredines*, he adds, turn round in the shell, to which they are not attached, and with which their covering only has a slight connection at one particular spot, to prevent the external tubes from being disturbed. This motion, Sir Everard observes, is for the purpose of boring.

**Generic Character.**—Animal very much elongated, vermiform, with a very delicate mantle, open in front and at its lower part for the passage of a mammilliform foot; tubes narrow, very short, especially that for the depressions: mouth small; labial appendages short; anus situated at the extremity of a small tube floating in the cavity of the mantle; branchial riband-like, united on the same line throughout their length, and a little prolonged in the appendage. The mantle and the tubes, in which is implanted a pair of pedunculated corneous-calcareous appendages or palumines, playing laterally one against the other.

**Shell.**—Small, thick, very short, annular, equally open before and behind; equivale, inequilateral, angular, with triangular valves, trenchant in front, and only touching each other by the two opposite edges; no hinge; an elongated, nearly straight, submiform, spoon-shaped process; a single slightly-marked muscular impression.

**Tube.**—Cylindrical, straight or flexuous, closed with age at the buccal extremity, so as to envelope the animal and its shell, always open at the other, and lining the cavity in which it was introduced itself.

Such is M. Rang's definition of *Teredo gigantea*, excluding *Teredo gigantea* (Septaria), of which he gives the following description, observing that it closely approximates to the *Teredines* and *Fistulana*:

**Animal unknown.** (But see the paper of M. Mathéron above referred to.)

**Shell unknown.** (But see the descriptions of Mr. Grif-fiths and Sir Everard Home here noticed.)

**Tube.**—Calcareous, thick, solid, in the shape of a very elongated cone, and irregularly flexuous, furnished internally with small, incomplete, annuliform septa; terminated at one of its extremities by a convexity, and at the other by two slender and separated tubes.

The number of species of *Teredo* (exclusive of Septaria) recorded by Lamarck in the list of *Animaux sans Vertébres* (1818) were two, *Teredo navalis* and *Teredo palumbulatus*.

of the latter Lamarck, who had seen neither its tube nor its shell, says that it probably only differs from *Teredo navalis* in its greater size, its longer palmules having been more easily observed.

M. Deshayes, in his Tables, makes the number five living and five fossil (tertiary), exclusive of *Septaria*; and, in the last edition of his 'Dictionnaire', adds species above noticed *Teredo corniformis* (*Fistulana corniformis*), *Teredo gregata* (*Fistulana gregata*, Lam.), and *Teredo arenarius* (*Septaria arenaria*, Lam.).

N.B. Lamarck had stated that the *Ropan* of Adanson (*Sénégal*, pl. 19) was nothing more than the *Teredinae*, remarking however that he (Lamarck) knew it not. But M. Deshayes points out that M. Rang, on his return from a voyage to Senegal, where he had an opportunity of observing the *Ropan*, found that this curious shell belonged neither to the *Teredinae* nor to the *Teredo* of *Pholades, as Bosc says, and still less to the *Gastrochaenelae*, as M. de Blainville supposes; but that it is a *Modiola* already known, *Modiola eauligera*.

**Teredo navalis.**—This is sufficiently described above, and we therefore proceed to the consideration of its food, habits, &c. Some of the *Teredines* examined by Sir Everard Home were sent from Sheerness in the wood alive, and they lived in salt-water for three days after being brought to town. Sir Everard observed that when the surface of the wood was examined in a good light, while only an inch in depth in the water, the animal threw out sometimes one, at others two small tubes. When one only was protruded it was most clearly perceived; but when two were thrown out, it was with difficulty distinguished. One of them was about three-quarters of an inch long; the other only half that size. When the largest was exposed to its full extent, there was a fringe on the inside of its external orifice of about twenty small tentacles, scarcely visible to the naked eye; these were never seen in the other; in that state; for when the tube was retracted, the end was first drawn in, and so on, until the whole was completely inverted: and therefore in a half-protruded state it appeared to have a blunt termination of a round edge. The smaller tube was not retracted when the larger was in the 'three tubes,' says Sir Everard Home, in continuation, while playing about in the water appeared at different times to vary in their directions, but usually remained at the greatest convenient distance from each other. The largest was always the most erect, and its orifice the most dilated; the smaller one was sometimes bent on itself with its point touching the wood. In one instance, where a small insect came across the larger one, the point of the smaller turned round and pushed it aside, and then went back to its original situation. In several instances the smaller one appeared to be the most sensible; since by touching the longer one gently it did not retract; but on touching the smaller one they both were instantly drawn in. Indeed whenever they were retracted the last were drawn in together. When the worm was confined within the shell the orifice was not to be distinguished in the irregular surface of the wood, which was covered with small fuel. The worm appears commonly to bore in the direction of the grain of the wood, but occasionally it bores across the grain to avoid the track of any of the others; and in some instances there was only a semitransparent membrane as a partition between two of them.

Sir Everard observes that as the *Teredo gigantea* bores in mud, on which it cannot be supposed to subsist, or even to receive any part of its nutriment from it, it becomes a question whether the *Teredo navalis*, an animal of much smaller extent, derives sustenance from mud which it destroys, or is supplied wholly from the sea. The last opinion seems the most probable to Sir Everard, because the animal, having red blood and very perfect organs, necessarily requires a great deal of nourishment for the purposes of growth, and to supply the waste coming on; but if, he observes, the aggregate of shell and animal substance is taken, it will be found equal in bulk, and greater in specific gravity than the wood displaced in making the hole in which he remarks, that a very small quantity of wood which the animal has taken into its body is wholly insufficient for its formation and subsistence. When once it is established that the *Teredo* can be supported independently of the wood which it inhabits, and can afterwards subsist when the communication between it and the wood is cut off, a doubt, he adds, is created about the wood forming any part of its aliment, and it becomes pro-
bable that the *Teredo navalis*, like the *Teredo gigantea*,
forms its habitat in a substance from which it receives
no part of its sustenance; and that the sawdust conveyed
through the intestines is not digested, particularly as that
examined by Mr. Hatchett had not undergone the slightest
change.

Mr. Hatchett found the ten grains of pulp from the
specimen above referred to to be an impalpable vegetable
sawdust. When burnt the smoke had precisely the odour
of wood; it formed a charcoal easily consumed, and was
converted into white ashes, in every respect like vegetable
charcoal. Solution of potash did not act upon it, so it
would have done if it had been an animal substance.

Sir Everard Home suggests that the straight course of
the intestine in the *Teredones* makes it probable that the
sawdust retards the progress of the food, so as to render
convolution unnecessary.

*Teredo Navalis* has been found at depths ranging from
the surface to ten fathoms.

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It is said, probably with truth, that *Teredo navalis* was
introduced into Europe from warmer climates. However
that may be, it now unfortunately swarms in our seas. The
ravages of this apparently insignificant animal are terrible.
Ships, piles, all submarine wood-works, are ruinously
affected by it; small as it is, it threatened the submersion
of Holland by its destruction of the dykes. The living
specimens which formed the subject of Sir Everard Home's
observations were furnished from one of the royal dockyards.
The rapidity of its growth and the destructive celerity with
which it works are hardly credible. A piece of deal, after
a submersion of forty days, was riddled by them, and some
had attained considerable size. Those from the dockyard
at Plymouth, examined by Montagu, were in piles which
had been recently taken up to be replaced with new; they
had not, according to the information given to Montagu,
been under water above four or five years, but they were
greatly perforated, though they were sound solid oak when
they were driven. The only effectual way of preventing
the attacks of this animal upon piles appears to be by
covering all that part which is continually beneath the
surface with short broad-headed nails. The action of the
sea-water on the nails produces a strong coating of rust,
said to be superior to a copper sheathing.

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In 1805 Captain Maxwell of the Calcutta East Indias
gave to Sir Everard (then Mr.) Home, a specimen of a
shell, five feet long, but imperfect at both extremities.
The captain said it was brought from Sumatra. Several
Mr. Home's friends considered it as a mineral substance,
a hollow stalactite, being misled by its rounded shape.
Sir Joseph Banks decided that it was a shell, and was
analysed by Mr. Hatchett, who found that it was composed
of carbonate of lime and an animal gelatinous substance
which was greater in quantity than in *Chams pies*. It
was less than in the common oyster. Mr. Home then gave
it to Mr. Marsden, who introduced him to Mr. Griffiths,
the paper of the last-mentioned gentleman immediately
proceeds that of Mr. Home in *Phil. Trans. for 1806*.

Mr. Griffiths relates that a short time after a very great
earthquake that occurred in Sumatra, in the year 1797
which produced 'a most tremendous' inundation of the
did great damage, and caused the loss of many large
shells were procured in a small sheltered bay with some
bottom, surrounded by coral reefs, on the island of Baroon.
When the sea receded from the bay after the inundation
they were seen protruding from a bank of slightly indurated
mud, and two or three specimens were brought to Mr.
Griffiths at Padang, by the master of a boat trading be-
tween that part and the island, for cocoa-nut oil, wax,
&c. Mr. Griffiths then sent one of his servants, a Papo
from his assistant, a Papuan, who was very expert at diving, in
in a small prau. This servant stated that he had found the shells
in the before-mentioned bay and in an inlet of the sea, stuck
out of rather hard mud, mixed with small stones, sand
&c. from eight to ten inches or more, and from one to
tree fathoms under water. Both the master and crew
assured Mr. Griffiths that the animal throws out tentacles
from the two apertures of the apex of the shell, that resembled the small actiniae adhering to the rocks about this, and that the body of the shell was filled with a gelatinous flesh similar to that of the Teredo navalis, but this they had washed out on account of its putridity. They said that the shells were in considerable number, and being gently shaken, easily taken up; but all of them were mutilated more or less, the effect probably of the earthquake, when many large fragments of madrepores, coral, &c. were torn from their seat by the agitation of the sea. More than twenty specimens were brought to Mr. Griffiths, but not one was complete: a portion of the shell with the apex nearly perfect, and another with the opposite closed extremity nearly so, were however procured. The length of the longest of Mr. Griffiths' shells was 5 feet 4 inches, and the circumference of the base 9 inches, tapering upwards to 2 1/2 inches. There were other good ones of smaller size. The large specimen was nearly perfect, having a small part of the lower extremity entire. Most of the shells had adhering to them, about me foot or more from the top, the small cockcomb oyster, small serpula, &c.; consequently, Mr. Griffiths observes, they must have been protruded that distance from the hard mud; but the water being thick and discoloured, the people of Battoo had not taken notice of them antecedent to the earthquake. The specimens were milk-white on the outside and within were tinged with yellow. Mr. Griffiths remarks that the large end of the shell is completely closed, and has a rounded appearance; at this part it is very thin. The small end, or apex, is very brittle and divided by a longitudinal septum running down for eight to nine inches, forming it into two distinct tubes, inclosed within the outer one, from whence the animal throws out lenticula. Mr. Griffiths goes on to describe the substance of the shell as composed of layers having a fibrous and radiated appearance, covered externally with a pure white crust, and internally as having a yellow tinge; and the external surface as frequently interrupted in a transverse direction by a sudden increase of thickness, which, he observes, probably indicates different stages in the growth of the shell, although they are at unequal distances, sometimes at six inches, sometimes at four, in the same shell. Many of the shells, he adds, are nearly straight, others crooked and contorted.

1. Teredo gigantea. 1, transverse section of shell, giving a front view into the orifice of the double tube, and showing the thickness of the shell at that part. 2, transverse section of shell at the thickest part after it had been polished, showing the structure, and giving a front view of the orifice into the double tube. (Phil. Trans.)

Fossil Teredines.

M. Deshayes in his Tables notes five species of fossil Teredines in the tertiary formation, Eocene period of Lyell—one from the English erag, one from Paris, and four from Belgium. Mr. Lea: (Contributions to Geology) records a species, Teredo simplex, from the Chalborne Beds, Alabama (tertiary). Professor Sedgwick and Mr. Murchison notice the genus in their Table of Fossils found in the Gouau Deposit and its Equivalents in the Alps; and also Teredo or Pholas, in their Table of Fossils of Lower Syria, as belonging to the middle system. Mr. Fitton, in his Systematic and Stratigraphical List of Fossils in the Strata below the Chalk, notes the genus, with a query, from the gault of Kent and Cambridge.

TERENTIA. (Comedy.)

TERENTIAN METRES. Few subjects connected with Latin literature have been treated with less success than the principles and laws which govern the metres of Latin comedy. The majority of readers seem to look upon the writings of Plautus and Terence as so much humble prose arbitrarily distributed so as to present to the eye the appearance of verse without its realities. For them it would be better if the whole were printed consecutively, and such an arrangement would in fact be supported by not a few of the existing manuscripts. On the other hand, there have been writers who have laboured to remove the difficulties that obscure the subject, among whom none but Bentley and Hermann appear to have had any success; and what they have done still leaves the subject in a very unsatisfactory position. Even the writer of the Life of Terence, in the 'Biographie Universelle' (published in 1826), has the following extraordinary criticism upon the metres of Terence:—"The sole rule which he observes with tolerable regularity is to end each verse with an iamb; and even this limitation he often disregards, as, for instance, in the terminations hic consiste; si vis, nunc jur; audio volenter; huc adducam; hanc venturum, &c. With regard to the other feet, he freely substitutes for the iamb or spondee, a trochee, anapest, dactyl, double pyrrhic, or four short syllables, and a glottis or short between two longs; &c. This writer thus starts with the false impression that all the verses of Terence are reduced by critics to the single metre, called trimeter iambic; where-
as, in fact, all who have dealt with the subject, except himself, are aware that the poet has at least three forms of verse which end trochaically; and his second exception is disposed of by the more correct orthography nunc iam. In English, so late as the 16th century, the metrician, Dr. Bentley, we have a scheme of the Terentian meters, which for the commonest of those meters, the trimeter-iambs, gives us the following scale:—

with the additional remarks that quo quisque hunc may be a dactyl, that si quidem est, studer ut, and the three first syllables of volupissippi, may pass for anapests, &c. &c.

All this is exceedingly unsatisfactory, and it would be better to abandon the problem as insoluble, than to give currency to extravagancies which would enable us to find in the Latin language the trimeter-iambs of Greek art. It must be admitted that the metres of the Greek dramatists, and more particularly of the tragedians, gratify the ear with rhythms which, comparatively speaking, are smooth and acceptable. But it should be recollected, in the first place, that the Greek language is distinguished from among other languages by its abundance of words which end in a short syllable, and the advantage to the poet is increased by the large number of instances where these short final syllables have a vowel ending. Compared for instance, the accusative singular μοριόν, λόγον, τοιον, ἐνώπων, with the Latin modum, servum, navim, lenon; the nominative and accusative plural ἡμών, εἰμι, with the Latin lenes, decem; the verbs enter, etc., the verbs as much to be regarded as they are in the Latin scribistis, scribit; the pronouns μι, ει, with με, τε, &c. In fact, the Latin language exceeds the Greek in the number of long syllables, as much as the English and German languages exceed the Latin.

All this more strongly raises the question whether and how far the written language of the Romans is an exact representative of the spoken language. It seems to be a condition of language in general that its pronunciation should always be passing through a series of changes, and that these changes should consist for the most part in the gradual omission of letters and even syllables. Thus the Roman phrase mea domina is in Italian madonna; in French madame; in English madam, madam, and even mam and ma'am; and for the most part the changes in orthography are slow, and consequently nearly always in arrear of the orthoepy. Thus it will be found that the sounds of English and German words which appear to the eye so weighed down with consonants, are in the mouth of a native tolerably harmonious. Was such the case with the Roman also? We answer with little hesitation in the affirmative, partly because the laws which now govern language can scarcely have been wanting in antient Italy, and partly because we find the word established by several incidental remarks in Latin writers. Thus Suetonius (in his Life of Augustus (c. 88), ' Orthography—that is, the laws and principles of writing laid down by grammarians—he was not very observant of, but seems rather to follow his own whims, of which we shall not speak as we speak for as to his habit of changing or omitting not merely single letters, but even whole syllables, that is a common error.' It should be observed too, that Suetonius had himself seen the handwriting of the emperor.(Ibid., c. 87). Again, Quintilian (Inst. xi. 3. 33) says, ' As for the one hand, it is essential that every word should be clearly articulated; so, on the other hand, to reckon up, if we may so speak, every separate letter, is painful and we very soon become weary of the exercise. On the other hand, not only is a coalition of vowels very common, but some too of the consonants are disguised (dissimulantur), when a vowel follows;' where he must refer to some other letter than m, probably the final s generally and the final d of neuter pronouns. Moreover Priscian, who by the way appears to have written when the Latin language had ceased to be spoken as a living tongue, at times throws out such conjectures as the following:—'I think that vigilt, vigiltis, should rather be pronounced per synoninon.' We might appeal to Cicero's authority for the fact that the final s was frequently omitted in pronunciation. But there are still other arguments in support of the principle for which we are contending. Within the limits of the Latin language itself we find such changes actually in progress—as magic, nisi, ipus, neque, atque, sive, nere, videtis, rere, rerunt, provides, mhi, nihil, quibus, populus, tegomena, opera, polcesse, movelo, noveris, noti, non, nonus, be, enim, quae, sive, nere, videtis, prudens, mi, nisi, quis, populis comparer ad populos tegmen, opera, postre, malo, noris, nos, det, et, quid. Principles of etymology would enable us to carry the list out to a vast extent. It is still more if we employed the analogies of the Greek tongue.

Again, the languages which are acknowledged to be derived from the Latin, such as that of the Troubadours, the Italian, French, Spanish, Portuguese, and one portion of the English, by their shortened forms, confirm our opinions and this will be found to be specially the case with the French. To those who may express their surprise that the Fenecia should thus take precedence in our argument of the Italian, the answer is, that the French is probably derived from Latin. Within the limits of the Latin language itself we find such changes actually in progress—as magic, nisi, ipus, neque, atque, sive, nere, videtis, rere, rerunt, provides, mhi, nihil, quibus, populus, tegomena, opera, polcesse, movelo, noveris, noti, non, nonus, be, enim, quae, sive, nere, videtis, prudens, mi, nisi, quis, populis comparer ad populos tegmen, opera, postre, malo, noris, nos, det, et, quid. Principles of etymology would enable us to carry the list out to a vast extent. It is still more if we employed the analogies of the Greek tongue.

Thus the word consul is written cons, because the n was not pronounced:—before s, as in the names of persons; as Sulem, as in the name of a French Poet; as consul, as in the name of a Roman emperor. We may observe of this word and of modo that unphonetically the same character, This word enters into the composition of the Latin quaesum which again in the languages derived from Latin assume various forms:—in the Romance, com; in Spanish, con; in Italian, come; and in French, comme. To this we now add the fact that the Romans themselves represented the n as an m. Thus in Terence's manuscript of Oedipus, the first of the changes in orthography is made, the word consul being turned into a consul. This manuscript mode of denoting the conjunction enim, a word which must often be pronounced like en to fulfil the conditions of Terence's metre. We may observe of this word and of modo, that an enclitic should not attract the attention of the ear. A third example shall be a third example from the quidem. Bentley himself observed the trouble caused by this word in the verses of Terence (Andr., i. 3, 20), and to remedy is to drop the final m, which however still leaves the verse encumbered with superabundance of syllables. We contend that this also is commonly a monosyllable, and on the following grounds. First, the metre of Terence requires it. Secondly, if Hiliem has a reduced form, the analogy will give us quena for quidem. Thirdly, the Romans, when they mean to express the reflexive in a syllable, or have some other word resembling otherwise such words, aqua for instance, would have had the final syllable long, and they also disguised the final m. Quintilian implies in the passage to which we have already referred, that we have arrived at a sound he tolerates. He here calls the word a metronom of the one to a monosyllable, and character, by which we strongly suspect to be the same word; so that if our suspicions be right, equidem atigit eë are of one origin, as well as of one meaning. Lastly, as the Roman language preserved a peculiarly Greek pronunciation for quidem. We have already cast it as an enclitic, and it appears beyond dispute that in that character in the words equidem, siquidem, quandoen dem. Now an enclitic should in its nature sacrifice itself to give necessity. Thus, in the case of the equidem, to the extraordinary ordinary teachers of Latin prosody, equidem, though a corruption from egoquidem, or equequidem, has the first syllable short. Again, quando by itself has the final o common.
to take the most unfavourable view, for in the poets of the Augustan age, as e.g. in the sixth line of the sarcastic \textit{esculapius}, where o is short, and in \textit{quadranque}, \textit{quadraundecim}, the vowel is always long. But add \textit{quid}, and they say \textit{quadraginta}, the same vowel always short. So also \textit{si} in \textit{aquadam}, according to their views, that is, it is short. Thus, according to our views, the true pronunciation suggests a correction of a corrupt passage in \textit{Persius}, Sat. i. 10:

\begin{quote}

\textit{Littera. Per me quidem sit omnium proditus alta.}
\end{quote}

The current reading is \textit{equidam}; and relying upon one error the editors have allowed the same \textit{equidam} to stand with \textit{dubites} in Sat. v. 45, when the context, as well as grammar, requires \textit{dubium}.

But to return to the subject before us. It is not uncommon with critics to imagine to themselves that the laws of Greek and of Latin verse are based upon principles essentially different from those of modern languages; the former, depending, they say, upon the length of syllables, the latter, that is to say, upon the quantity of the vowels. We believe it to be wholly without foundation. We rely little upon the fact that Priscian's treatise headed \textit{De Accentibus} is only a schoolboy-linge-scanning of the first lines in the \textit{Aenid}, because, as has been already said, that writer's name is best explained by the confused state of the spoken tongue; and in fact, for the same reason there is little dependence to be placed upon the dogmas of the other so-called grammarians, such as Diomedes. Our view is that which the laws of Terence and Plautus themselves, and are confirmed to a considerable extent by the hexameters of Virgil and the lyrics of Horace. They also seem to be supported by the general principles of language. We will endeavour briefly to state the results at which we think we have fairly arrived.

I. In words of more than two syllables, if, according to the received prosodies, two or more short syllables, exclusive of the final syllable, occur together, the second of those short syllables was slurred over. For instance, in some cases the changing a vowel \textit{o} or \textit{e} into the sound of a \textit{g}, of a vowel \textit{a}, \textit{o}, or \textit{u} into the sound of a \textit{w}, would be the simplest mode of effecting such a result. Thus \textit{adhibe}, \textit{adhibet}, \textit{construere}, \textit{construe} \textit{gervinum, consilium}, the last of which is confirmed by Horace's use of the same word in his odes, and the Italian \textit{consiglio}, Fr. \textit{consil}, Sp. \textit{consejo}; and at any rate our pronunciation of the two former, and of the name of the Poetaster, \textit{construo}, is as the mode usually adopted, viz. \textit{por-ti-nus, adhibiere}. Bentley has himself observed (\textit{Bom.}, ii. 2, 36) that the words \textit{mulier, mulieres, &c.} are always so placed in Terence as to have the accent on the first syllable; which, by the way, is consistent with the Italian \textit{moglie}, and the Spanish \textit{mujer}. We doubt however whether the dative plural would be found to obey the law laid down by Bentley. In those cases where the second short vowel is followed by a consonant, the above-mentioned pronunciation becomes inapplicable, if at least that consonant be really to be sounded. In such cases the right course is probably to drop the syllable altogether. Thus \textit{miemira, familia}, and such words, Hermann (\textit{De Re Metrica}) truly says, are to be pronounced that way which is in accordance with the usual stress of the law laid down by all the grammarians, that the accent cannot be carried farther from the end of a word than the antepenult. Hermann has not attempted to reconcile the two assertions, but they fall at once into agreement when the stress is upon the final syllable, for then the first becomes an antepenultimate; and we are only doing what is common in our own language, as in \textit{very, lovely}. This principle moreover may be clearly tested by forming so-called words with \textit{pupus} that should be treated \textit{pupulat}, but that becomes \textit{pupulat} or \textit{pubulat}. If \textit{pello} has a perfect \textit{pupulat, cada} a perfect \textit{sectid}, the compounds with \textit{re} should strictly give us \textit{repupulat, recedetti}; but we find \textit{repupulat, recedessi}. Again, in connection with \textit{opfer} we ought to have \textit{opfepulis} and \textit{Oppfasta}; but these have been supplanted by \textit{officiam} and \textit{officiata}; so too the Greek \textit{stibovtr} becomes in Latin \textit{oppidum, as opposed to the arx, or citadel}; and the adverb \textit{vulgaris, as the form of \textit{oppidum}, an equiv- alent in meaning to \textit{planeo.}}

II. The accent of a Latin dissyllable or polysyllabic will fall upon the penult if long. Where that penult is long by the nature of the vowel, and at the same time the final syllable is short, the accent falls on the penult. Thus \textit{pulver}, \textit{pubescentia}; or, in the case of a circumflex; in other cases an acute accent. Secondly, if the penult be short, put an acute accent upon the antepenult, always performing the previously mentioned abbre- viation, if need be; the necessary effect of which is to carry us a long accent upon the penult.

III. The preceding rules dispose of every case except two classes of words, viz. dissyllables with a short penult, and monosyllables. The former are either to be pronounced \textit{abscripta, abscriptus}, or case to be attached to the preceding or following word; and the double word thus formed to be accentuated as a polysyllable. When a word is attached in pronunciation to that which precedes, it has already received in common use the name of enclitic. Hermann, who first observed that there are also words which attach themselves to those which follow, has proposed to give them the name of proclitics. The Greek article, for instance, belongs to this class, as also not infrequently the Latin \textit{et}, \textit{etiam}, \textit{etque}. The name \textit{et} is true of \textit{es}, \textit{em}, \textit{en} as really prepositions, when they are used before a verb, or as an ends of a single word. Many little conjunctions also may probably require such treatment, as \textit{et, ut, &c.}. Again, the list of enclitics should be extended so as to include most of the conjunctions which require to be placed second in a sentence, and even conjunctivs in general, together with the relative itself when they are forced, if the word may be used, into a second place, as, for instance, in the first line of the \textit{Aenid}, which acquires additional power by the pronunciation \textit{Troiamque fugat}. Such \textit{fugat} is the true \textit{fugit}, which is the true \textit{fugio} of the same word. Many disyllables and monosyllables will coalesce into polysyllables, and be accentuated accordingly. We even entertain a strong suspicion that a verb in the middle of a sentence must often be treated as an enclitic to give tone to some important word before it. But a statement of our grounds for this belief would require too much room.

IV. The principle of elision will often modify the accent of a word. Thus \textit{cuppri, scrupulam, arguento,} would in ordinary circumstances have the accent as marked. But if elision take place, they sometimes have the accent displaced. In this way the first ant eleven lines of the Poetaster, \textit{De tristia}, \textit{et poetae cum prim' sms adscribend' adpluit}; and \textit{Non y\'t dissem'li sunt arguento' et tamen}. It should also be ob- served that elision often destroys the initial vowel of the second word, instead of the final syllable of the preceding word, as \textit{nunc tradant officium}, rather than \textit{nunc tui est officium.}

If now the principles we have assumed on the grounds above mentioned be applied to the plays of Terence, we arrive at the result, that the verses, with very few excep- tions, acquire the desired rhythm; and that there should be exceptions must be expected where the text of an author is not yet established upon a careful comparison of manus- scripts, and where even the transposition of two words will it should always be re- collected that in the comic drama it may be even desirable to avoid the proper rhythm of verse, and approach somewhat to the prose of natural conversation, as Cicero has himself remarked (\textit{Orator}, 43). That we now may be passed the test, we will give a list of those words requiring abbrevi- ation which most commonly occur, observing at the same time that a word at the end of an imitable trimeter, or after a monosyllable, is often to be pronounced, and all the circumstances of the case considered.

Thus this example may be seen in the tenth line of the prose already referred to, which contains both \textit{nocevit} and \textit{portas}.

\begin{itemize}
\item \textbf{senex} = \textit{sen}. Compare the genitive.
\item \textbf{opter} = \textit{opter}, \textit{opter}, as in French.
\item \textbf{voluta pluma voluntas}. Compare \textit{vis = edilei} and \textit{invidia.}
\end{itemize}
acura = lomro. Compare sermon, from sacramentum.
hoede = is; as in Italian.
dice = jour. Compare jour, journée.
egro = yo. Compare Italian.
caze = case. Compare Cicero's story about the word

tace = tue, as in French.
quines = quiues. Compare the loss of b in the dat. pl. of
the first and second declensions.
tibi = ti. Compare the Romance, Ital., Fr., Sp., and
Italian.
ti = mihi. Compare Greek 

ubi = ou. Compare Greek.
abi = at. Compare Greek.

jube = ju. Compare the perfect jussi.
tnse = in. Compare the French en, and Latin dem, 
exin, &c.

redi = rei. Compare mai it., maiis Fr., mas Sp.

magis = mai. Compare mai, Fr., maiis Sp.

minus = mims. Compare Greek 
alx.

alxus, &c. = aux or ex. Compare It., Fr., Sp., and
English. the form used in Greek.


vigilare = vigilare. Compare Fr., Ital.

tid = et. Compare Fr. voi-eti, voit.

nous = Novus. Greek 


do = do. Compare Greek 

St. 

male = mal. Compare Fr.

hollo = comme, as in French.

rei = re. Compare the forms of the fifth declension
used by Casar, Virgil.

puet = par or por. Compare Greek 

anxus, &c. = aux or ex. Compare It., Fr., Sp., and
English. the form used in Greek.

faut = fut. Compare It., Fr., and Latin fore.
animus = ausus. Compare Ital., Fr.
anxius = auxus. Compare Fr.

dedrose = sepulchro. Compared with the form in
Ennuis, &c.

legers = lere. Compare Fr.

oculix = ellelus. Compare Fr.

generix = genirs. Compare Fr.

opirere = opir. Compare Fr., It.

opera = opra. Compare the form in Ennuis, and Fr.,
Sp.

sinilis = simulis. Compare Fr. semble, Eng. resemble.

tamen = ta'n. Compare tamen etameni, &c.

aliquis = aliquis. Compare It. alcuno, Fr. aucun, from
aliquis-usus.

nufus = his. Compare the abbreviation of nullius
into nullus and nat.

ctx = is.

It should be added that of modern editors Hermann,
Bothe, and Lindemann alone seem to have a distinct idea
of the nature of the metres of Terence and Plautus, for all
that has been said applies to Plautus as well as Terence.
Among older writers, Bentley certainly possessed a clearer
insight into the subject; and some of his notes would lead
one to suppose. That this is the case is proved by an anecdote
in Bishop Monk's Life of that scholar. The reverend
doctor, dining at a friend's house in London, kept the
guests long over their meat, and as they were likely to
miss Bailey. The doctor was only reading to them some
specimen of Terence's Comic Septemarius, or, to use a

harder phrase, the Iambic Tetrameter Catalytic.

TERENTIUS NUS MAURUS. [MAURUS TERENTIUS.]

TERENTIUS, or more fully P. TERENTIUS APER,

was one of the two comic poets of Rome whose works have
come down to us. The facts of his life were matter of dis-
pute even among the Romans themselves. If we may rely
upon the biography attributed by some to Donatus, by
others to Suebonius, he was born at Carthage, and became
the slave of a Roman senator named Terentius Lucanus
who, pleased with his abilities and handsome person, first
gave him a liberal education and afterwards his freedom at
an early age. Some, on the other hand, stated that he origi-
nally belonged to a slave as a prisoner of war. At Rome he
lived on terms of intimacy with many men of family, more
particularly the second Scipio Africanus and his friend
Laelius, who were even said to have assisted in the com-
position of the six comedies which bear the name of Terence.
Many were even of the opinion that these two nobles merely borrowed the name of Terence for what
was wholly their own. Before he had completed his
thirty-fifth year he left Rome, either to avoid the odin
which, according to the suspicion that he had published;
the writings of others as his own, or to study the institutions
and manners of the Greek nation, and thus qualify himself
for fresh exertions in the field in which he had chosen. He
never returned, but the accounts of his death were various.
Some said that he embarked for Asia, and was never seen
from the hour of his embarkation; others that he died as
his way back from Greece, where he had translated one
hundred and eight plays of Menander; while others again
contended that having sent his translated plays in a箱
ship, he received the news that this ship with all its
property was lost at sea, and died through grief.

But a consularip of Cn. Cornelius Dolabella and M. Fr,
Nobilior, either at Synophus in Arcadia or at the
Locris, died there. He was a man of spirit, of
figure, and dark complexion. He left a daughter, whose
she married a Roman of equestrian rank, and a property of
it jugs on the Appian road. But another authority reports
that he died in the most abject poverty. Eusebius, or St.
Jerome, was the first to place Terence in the reign of
Ptolemy Philometer, and this king died in the third year
of the 158th Olympiad, or the close of 146 B.C.

The difficulties in the life of Terence are chiefly of a
chronological character: the following table of ascertained
dates is given to aid the student:

218 B.C. Commencement of Second Punic War.

201 B.C. Peace granted to the Carthaginians.

183 B.C. Birth of Scipio Africanus the younger.

134 B.C. Death of Ptolemy.

160 B.C. Death of Ennius.

108 B.C. Death of Cæcilius (partly on the authority of
St. Jerome).

106 B.C. The Andria acted at the Megalenean games.

102 B.C. The Hecyra acted at the same games, and
The Phormio at the Roman games.

99 B.C. Death of Ennius.

The Adelphic acted at his funeral games, at the expense of his
friend Fabius and Scipio.

150 B.C. Consulship of Cn. Cornelius Dolabella and M.
Fullius Natinus.

149 B.C. Commencement of the Third Punic War.

Thus it appears that the whole period of Terence's
life must have been included in the peace between the Scyths
and the Third Punic wars; so that if taken prisoner it

war, that war could not have been one between Rome and

Carthage. Again, there is a chronological difficulty in
the story that the poet, when he offered his Andria to

the ediles, was directed to obtain the approval of Cæcilius
that he accordingly went to the house of the latter, and

read the play to himself on a stool and en-

terence reading while the other dined; but that after

a few verses Cæcilius was so charmed that he in- 

vited Terence to take his seat at the table and dine with him.

after which he read through the remainder of the pro-

duction. The story of Cæcilius and Scipio and Laelius is
altogether rendered impossible by the youth of the part.

though Scipio was but nineteen when the Andria was
acted, and Laelius was of about the same age with his
friend; but the difficulty becomes greater when we find in

the prologue of the Adelphic, that the nobles who were
said to give him their aid are spoken of in terms scarcely
applicable to men so young.
Be the parties charged to have lent their aid to the poet who may, it is clear that the poet gives no denial to the accusation, either in the words just alluded to, or in the prologue to the 'Hautontimoroumenon.' Even Cicero ('Ad Attinem,' vi. 3) mentions the report that Laelius was the real author; and Cornelius Nepos, who wrote the way may make: the three parties, Scipio, Laelius, and Terence, of the same age (sequaces), tells us an anecdote which confirms the report. C. Laelius says, he happens to pass the Matronalia (a festival at which, where we obtain the history) while the year was bound to obey the lady) in his villa near Puteoli, was told that dinner was waiting, but still neglected the summons. At last, when he made his appearance, he excused himself by saying that he had been in a peculiar way. The performances which occur in the 'Hautontimoroumenos,' v. the beginning Sotis pol proterepo me Syri promissoua tuin trevnomos.

The fact of the poet being called Terentius is perfectly in harmony with the circumstance of his alleged master having that name, as it was the ordinary practice of the manumitted slave to take the nomen and praenomen of his late master. On the other hand, it is altogether an error at the part of Orosius to confound the poet with the Q. Terentius Callinus, who, in the guise of a manumitted slave, accompanied the triumphal procession of Scipio after his destruction of Carthage in the year 146 B.C. The name of Afer seems to confirm his Carthaginian birth, unless indeed that assertion be only an inference from the name itself.

For this contrary to the Greek comedians Manander and Apollodorus; but he was not a mere translator, for one of the charges brought against him was that he drew the materials of a single play from two or more of the Greek plays. However, any and all the same provision, in the provinces he differs widely. Though Plautus excelled in powerful but ludicrous expressions, he was altogether deficient in the formation and development of a plot. Terence, on the other hand, though even he occasionally introduces the buonofority of the 'milns glorious,' the 'panathyas,' and the 'curmyn servus,' to gratify the prejudices of his more unpolished hearers, who were better able to appreciate the merits of a boxer or a rope-dancer, still deserves our admiration for his efforts to place before his countrymen the comedy of magnificence, which, if always successful; the failure was due to the rude minds of his spectators and the magnitude of a Roman theatre, and perhaps also to the use of masks, which, if always used, must have been a serious obstacle. The edition of Terence is that of Bentley. Amsterdam, 1727. The modern imitations of Terence may be seen in Dunlop's 'Roman Literature.' George Colman has translated the comedies of Terence into English. There are French translations by Madame Dacier and Le Monnier.

Terez. [MEXICAN STATES.]

TERGIPES. [Nushirvani, vol. xvi., p. 361.]

TERM. (Algebra.) A simple term in an algebraic expression means all that involves multiplication, division, and extraction of roots without addition or subtraction. Thus in the expression

\[ a^2b^2 - 2ab + 1 \]

the terms are \( a^2b^2 \), \( 2ab \), and \( 1 \). But compound quantities are also called terms when they are put in such a form that additions and subtractions are subordinate to subsequent multiplication, division, or extraction. Thus,

\[ ab + 2a + 2b + 1 \]

has two terms, \( ab + 2a + 2b \) and \( 1 \). If the form be altered into

\[ ax^2 + bx + c \]

the expression then has three terms. Most frequently however there is one letter in powers of which the whole expression is arranged, and then all that involves one power of this principal letter is a term. Thus \( +bx + c \) and \( -by + 3z \) (the former four juries act by the chief act in London and Westminster). These terms are appointed by 1 Wm. IV., c. 73, s. 7, and consist of not more than twenty-four days, exclusive of Sundays, after any Hilary, Trinity, and Michaelmas Term, nor more than six days, exclusive of Saturdays of any other Term, in every instance consecutively after such Terms. The judges are also empowered by the same section to appoint such day or days as they shall think fit for any trial at bar (that is, a trial before a judge) the Court of the Sessions, if in vacation, is for the purposes of the trial to be deemed a part of the preceding Term.

There is also a provision which enables the judges, with the consent of the parties, to appoint any time not within
the twenty-four days for the trial of any cause at Nisi Prius. The sittings during the two, four, and six days are called Term days, and are held for the trials for causes at Nisi Prius for London and Westminster, which places do not part form any of the circuits. Sittings at Nisi Prius are also held for the same purpose before single judges, and are limited to three days, but not thirty, which is a term taken within the Term. (Spelman, Of the Terms; 3 Blackstone's Com., 275.)

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called the terminal expression. Thus in Taylor's 
Thes
sem we have one terminal expression in D'Alembert's 
form, another in that of Lagrange.

There is also another use of the word, which would 
convert distinction to mere repetition. There is no 
allude to what might be called terminal language. All 
the use of the words is infinitely small and infinitely great 
[Indies; Lmr] is entitled to this name; as follows: 
When we say, for example, that a circle is a regular 
polygon or circle, the latter term is, in common 
speech, the name of a circle, and is generally held to 
be, false: no polygon is a circle, how great soever the 
circle, or how small soever the magnitude, of the sides.
The proposition which is really true, that is, over which 
all sides have, whatever their notion of infinity may be, 
is that the terminal proposition, true or false, is one to 
which an interminable and unlimited degree of approxi-
mation may be made. An inscribed regular polygon may, 
with sides enough, be made to coincide with the circle 
when any angle tends to a right angle. The following 
proposition—the area of the inscribed polygon 
may be made to differ from that of the circle by less than 
the nth part of the latter—may be made true for every 
value of n that can be named, however great. Terminal 
inscriptions, however, are used by writers who cultivate 
the art of expressing by inscriptions, whatever 
abbreviation of all those truths whose announcement con-
tains interminable approximation: the development of 
this sentence is the object of the article Infinitesim.

TERMINALIA, the festival of Terminus (Terminus), 
originally celebrated by the Romans in the 21st of February.

It was said to have been instituted by Numna with the 
worship of the god himself. The festival was of a twofold 
character, either public or private, according as it was held 
at the borders of the city or at the borders of the city 
and at the boundary of the Ager Romanus. In the former 
the persons possessing adjoining lands met with their 
families and servants at the stone which divided the 
properties, adorned it with garlands and offered sacrifices, 
and in a feast in which the neighbours partook was intended to 
renew the friendly relations existing between them. (Ovid., 
Fast., ii. 643, &c.) Dionysius states that down to his time 
the Romans did not offer any bloody sacrifices on this 
occasion, but only cakes and fruit. But we have the most 
satisfactory accounts in the annals of the ancient 
Dionysius can only apply to the early period of 
the republic, and that subsequently a lamb or a sucking pig 
was sacrificed. (Dionysios, i. 74; Plutarch, Numa, 10; 
var. Rom., 16; Horatius, Epod., ii. 56.) The public 
Terminus was a sacred object, to which the citizens of 
whole people on the boundary of the Ager Romanus. 
(Ovid., Fast., ii. 679, &c.)

Hartwig, Die Religion der Römer, ii., p. 52; Diction-
yon of the form of a milky juice, which, on being dried, 
which was in great repute as a cosmetic. It has an agree-
able fragrance, resembling gum-benjamin, which in a great 
measure depends on the benzoic acid it contains.

T. vernix, Varnish Terminalia, has linear-lanceolate 
leaves, narrowed at each end, and glabrous beneath; the 
petioles are also glabrous. This plant is native of the 
Moluccas, and abounds in a resinous juice, which is 
collected by the inhabitants, and used in the natural state as 
a varnish. It is also used for the same purpose in China.

T. Catappa has large opposite leaves, tapering to the base, 
pubescent beneath, and glans on the under sides of the 
midrib. It is originally a native of the East Indies, but 
has now become naturalised in the West Indies.

Some botanists have described the West India species as 
distinct, but there is no necessary character. The drupaceous 
fruit of this tree is about three inches long, and contains a large seed, which is 
used for eating and obtaining an oil, in the same man-
ner as the almond. This tree, on account of its thick 
foliage, is much planted in the tropics for the purpose 
of forming avenues near houses. The bark and leaves yield 
a black pigment. Indian ink is manufactured from the 
juice of this tree. It yields a light durable timber, which 
is much used.

T. glabrata, smooth Terminalia, very much resembles 
the last, but the leaves are glabrous beneath and small.
The fruit is also of a much less size, oval, and less fur-
rowed. It is a native of the Society and Friendly Islands, 
and is cultivated by the inhabitants on the sides of their 
burial-places. The wood is used in these islands for 
building boats, making benches, &c., and the seeds are 
eaten.

T. Bellierica, Bellerica Terminalia, has glabrous, elliptic 
entire, acute, alternate leaves, and bi-glandular petals.

It is a native of mountainous districts of the East Indies.

Its flowers are very feicit. The fruit is reputed to possess 
tonic, astrigent, and attenmpt properties. When the 
bark is wounded a gum flows out, which is insipid, 
resembling gum-arabic.

T. Chebula is also an East Indian species, it is distin-
guished from the last by possessing opposite leaves which 
are pubescent beneath. The fruit of this species is more 
astringent than the last and is used for the purposes of 
dying. A durable ink is made by mixing the salts of 
iron with an infusion of the outer rind of the fruit. Both 
this species and the last are subject to the attacks of 
insects producing gall-nuts. These galls possess the sa-
mestone principle in an enormous amount, and are excised 
for dyeing. They are called Caduceus by the Tamils.

The genus Buchea is very nearly allied to Terminalia, 
and belongs to the same natural order. It is distinguished 
from the latter genus by its ureseculately-campanulate 
cyly, and its fruit. The genus is named from the 
men. The most remarkable species is the Buchea buccara, 
the ox-horn olive-tree, known in Jamaica as the black 
olive, in Antigua as the French oak, and in the French 
Indies as Grisette. It is a small, spiny, and ovate-cune-
form, and small yellowish flowers disposed in cylin-
drical spikes covered with a silvery pubescence. It is 
a native of the West India Islands on clayey soils near 
the coast. It has obtained its name from the tendency of 
its branches to shoot out into monstrous spongy excrescences 
resembling in form the horns of an ox. These excrescences 
resemble galls in their nature, and are probably produced 
by insects puncturing the terminal bud of the branch. 
This tree is remarkable in appearance by its slender 
and tufted leaves, but it attains a consider-
sable size, and its timber is valuable. The bark of this 
contains an astringent principle which is extensively 
used in tanning.

In the cultivation of species of Terminalia and Buchea 
a soil composed of loam and peat should be preferred. 
Cuttings strike freely when placed in a pot of sand and 
covered with a hand-glass. 

(Don's Miller's Dictionary; Burnett's Outline of Bo-
tany; Buchscho, Lehrbuch der Botanik; Lindley, Natural 
System.)

TERMINUS, a Roman deity whose worship was said to 
have been introduced by king Numa Pomphilus, when he 
ordered the fields of the citizens to be bordered by hedges 
which were to be considered as sacred to Terminus, as 
Dionysius calls him, Zoös Speos. (Festus, s. v. Terminus,)
Termius is also now used to signify the buildings for offices, &c., at the extremity of a railroad, whereas those erected at intervals along its course are called stations. The establishment of railroads has therefore given rise to a new and important class of structures, which, from their extent and form, must have been regarded as being rendered very striking in character and design. One of the most monumental architectural works of the kind as yet erected, is the Terminus of the London and Birmingham Railway, in Easton-square,—a Grecian Doric propyleum (distinguished in antis, on both fronts) on a large scale, the columns being about 70 feet high. The Terminus at the Birmingham end, though by the same architect (Hardwick), is in the Italian style. (For views, &c., of the Terminus of the G.T.R., see Companions to the Advancement, 1839.) Other termini that may be mentioned for their pretensions to architecture, are—those of the London and Southampton Railway, the one at Nine Elms, Vauxhall, the other at Southampton, both handsome buildings in the Italian style, by Tite; that at Blackwall, by the same architect, and in asimilar style; and those at Liverpool, York, and Brighton. The positive necessity for some covered gallery, either colonnade or arcade, and the obvious convenience for making of a propyleum or gateway, a marked feature in the general design, affords more than ordinary scope to the architect. Now that railroads (Chemins de Fer, and Eisenbahnen, as the French and Germans term them) have been introduced upon a scale that produces many architectural constructions for their termini. Some designs for Abfahrtsgebäude (Termini) may be seen in Stüler and Strack's 'Architektonisches Album.'

Termits, a section of Neuropterous insects, in which Latreille includes the genera Manispa, Raphelia, Termes, and Procitus. These genera are generally regarded as constituting three distinct families, and will be here treated as such, commencing with the Raphelia of Leach, which includes two first-mentioned genera. The insects of this family have the antennæ slender and composed of more than ten joints; the tarsi have from three to five joints; the wings are nearly equal in size and have numerous nervures including small pogoza, three generat terga and tergites ( especially the upper margin yellow. It is found in France as G. Germanica, and in Spain as G. Lusitana, etc.

In Brazil are species closely allied to Manispa, which differ in having the antennæ as long as the body; the wings are nearly horizontal; the body is depressed and terminate in numerous appendages. They form the genus Hoplóphora of Perty.

In the genus Raphedia the body is rather slender, the prothorax is long and almost cylindrical, the head broad and somewhat depressed, and the eyes are prominent; the antennæ are often terminated by a group of about thirty-seven joints. The abdomen is terminated in the female by a long ovipositor. The legs are slender of moderate length, and the tarsi are four-jointed.

Rome (Termitidae) is a genus peculiar to the country: it is rather more than one-third of an inch length, and the expanded wings measure 1 of an inch; the head and body are black, the antennæ and legs yellow, and the wings are transparent.

The larva of this insect lives in the bark of trees and is said to prey upon other insects. It is exceedingly active in its motions, which are somewhat like those of a scale.

The body is soft, long, and slender, of a brown coarsely striped, and variegated with yellow; the head and thorax are corneous and of a black colour. In the latter part all the parts of a perfect insect are distinct, being enveloped in a thin membrane.

Family Termitidae.—This family is distinguished by the following peculiarities:—Wings with few transverse narrow, folding horizontally; tarsi four-jointed; antennæ short; moniliform; body depressed.

In the genus Termes the head is large and rounded, as besides the ordinary compound eyes, it has three ocelli. The antennæ are three-jointed, and the tarsi are four-jointed, and their nature and general form of the body distinguished these insects as neuter or workers. They ravage the various parts of the globe are well known. They unite in some confined to the tropics; some few species have extend into the temperate regions. Like the bees, wasps and ants, which live in society, the Termites are confined to the tropics, and are generally called the termite or navahgodter. They are considered as working for the benefit of the colony. They are sometimes found on the ground in the form of pyramids or cones, sometimes with a roof, and these nests are often very numerous, and resemble the huts of savages.

They are the only given occasion, and in many architectural constructions for their termini. Some designs for Abfahrtsgebäude (Termini) may be seen in Stüler and Strack's 'Architektonisches Album.'
extravaganz. They are said to defend the nests, and station themselves near the outer surface, they are the first to make their appearance when their habitation is disturbed: they will attack the party molesting them, and bite with considerable strength.

The negroes and Hottentots consider these insects a great delicacy. They are destroyed with quick-time, or more readily with arsenic, which is thrown into their habitations.

The Procidae are very small insects, having soft and swollen bodies; the head is very large, nearly trigonal, and provided with three ocelli on the upper surface. The wings when folded meet at an angle above the abdomen, and are sparingly provided with nervures. The antennae are setaceous, and composed of about ten joints. The tarsi are short, and usually two-jointed. They are very active in their motions, and live in the bark of old trees and in dwelling-houses. Nearly forty species are said to be found in this country.

TER MOLI. [SANNIO.]
TERMONDE. [DEN DERMONDE.]
TERN, STERNA, the name of those web-footed long-winged birds which are vulgarly known as Sea-Swallows.

Linnaeus, in his last edition of the Systema Nature, places the genus Sterna between Larus and Rynchops.

Cover arranges the Hirondelles de Mer between the Golandae (Larus) and Rynchops. He observes that these Hirondelles de Mer derive their names from their excessively long and pointed wings, their forked tail, and their short legs, which give them a port and flight analogous to those of the Swallows. Their bill, he adds, is pointed, compressed, straight, without curvature or projection; their nostrils, situated towards the base, are oblong and pierced through; the membranes which unite their toes are very much notched, they therefore swim but little. They fly in all directions, and with rapidity over the sea, uttering loud cries and cleverly picking up from its surface the mollusks and small fishes which form their food. They also advance inland to lakes and rivers.

Head and foot of Tern:

The same author states that the Noddies may be distinguished from the other Sea-Swallows. Their tail is not forked.

The views of Mr. Vigors, Mr. Swainson, and others, as to the position of the Terns, will be found in the article LARIDÆ.

Mr. Swainson makes the genus Sterna consist of the following subgenera:—Sterna, Linn.; Thalassites, Sw.; Phaetetus, Linn.; Rynchops, Linn.; Gavia, Briss.

The Prince of Canino places Sterinae, the second subfamily of his Laride, between the subfamilies Rynchopinae and Larineæ. The Sterinae consist of the following genera:—

Sterna, Linn.; Hydrochelidon, Boie; Megalopterus, Boie (N.B. Sterna Solida of authors); Thalassaeus, Boie; Hydrochelidon, Brehm; and Stylochelidon, Brehm. (Birds of the South and North America.)

Mr. G. R. Gray (Genera of Birds) arranges the Sterinae as the third and last subfamily of Laride, immediately after Rynchophineæ, with the following genera:—Phaetus, Wagl.; Gelochelidon, Brehm; Thalassaeus, Boie; Stylochelidon, Brehm; Gygyst, Wagl.; Sterna, Linn.; Sterna, Boie; Hydrochelidon, Boie; Anous, Leach (Sterna solida of authors); Onychoprion, Wagl.; and Pelecanopus, Wagl.

The Plecanidae immediately follow.

Geographical Distribution and Habits.—The habits of the Terns, which are widely diffused over the maritime parts of the globe, are noticed in the article Larideæ. The following have occurred, some occasionally only, in Europe:—

The Caspian Tern, Sterna Caspia (genus Stylochelidon, Brehm); The Sandwich Tern, Sterna Cantica (genus Thalassaeus, Boie); The Gull-billed Tern, Sterna Anglica (genus Gelochelidon, Brehm); the common Tern, Sterna Sterna (genus of authors); the Roseate Tern, Sterna Dongallii (genus Sterna); the Arctic Tern, Sterna Arctica (genus Sterna); the Little Tern, Sterna minuta (genus Sterna, Boie); the Noddy, Sterna stolidu (genus Sterna, Leach; Megalopterus, Boie); the Black Tern, Sterna nigra (genus Hydrochelidon, Boie; Virgule, Leach); the White-winged Tern, Sterna leucoptera (genus Hydrochelidon Boie); and the Moustache Tern, Sterna leucoparea (genus Hydrochelidon Boie; Virgule Leach). Of these, only the Caspian Tern.

Our limits will not allow us to follow the above two examples, and we select the Common Tern and the Noddy. We should premise that all the Terns of the British Islands are strictly migratory: many species visit us regularly for the purpose of breeding; but those, the Noddy for instance, whose home is far away, are seen casually and rarely.

The Common Tern.—Description.—Forehead, top of the head, and long feathers of the occiput, deep black; second posterior part of the back, and wings, bluish ash; lower parts pure white, with the exception of the chin and the under parts, which are distinctly soiled, a white, nearly, which is slightly clouded with ash-colour; quilla whitish ash, terminated by ash-brown; tail white, but the two lateral feathers blackish-brown on their external base; the centre blackish-brown; feathers at the rump; iris reddish-brown; feet red. Length 13 to 14 inches.

Such is M. Temminck's description of the adult male and female.

The same author describes the young of the year before the autumnal moult as having the front, and a part of the top of the head, of a dirty white, marked towards the occiput with blackish patches; the long occipital feathers brownish-black; upper parts of tawny bluish ash; all these feathers bordering and terminated with white; the two outermost quite white, and irregularly spotted with brown or bright reddish; the lower parts of a dirty tawny ash; tail-feathers ash-coloured, terminated with whitish; base of the bill faded orange; iris blackish-brown; feet orange.

This is the Pierre Garin of the French; Fionco and Rondine di Mare of the Italians; Meerschwalbe and Rothfußiger Meeerschwalbe of the Germans; Zee-schwale of the Netherlands; Kria of the Icelanders; Tende, Tem- delic, Stand-Tolle, and Terme of the Norwegians; Terme of the Danes; Sea-Swallow of the modern British; and Y för-wennol fynaf and Yræcan of the antient British.

Geographical Distribution, Habits, &c.—The Common Tern says Mr. Gould, in his great work on the Birds of Europe, 'although not universally dispersed over our coasts, is nevertheless a very abundant species, being found in great numbers over the southern shores, but more sparingly over the northern, which are almost entirely inhabited by its near ally, the Arctic Tern. It is now satisfactorily ascertained that the common Tern does not extend its range to the American continent, and that its place is there supplied by another species, to which the name of Musisus, now Fermin, is given. The name Wilsoni, in honour of the celebrated ornithologist by whom it was first described.' The Prince however gives both Sterna Wilsoni and Sterna Wilsoni Sturmi; as American, in his Birds of Europe and North America; and M. Temminck states that individuals killed in North America differ in nothing from those of Europe. In the fourth part of his manuscript (1840), though he adds to the synonyms and references, quoting among others Mr. Gould, he has omitted the above observation, and consequently his statement is now unnoticed concealed. 'How fair,' says Mr. Gould in continuation, 'the Common Tern is distributed over the Old Continent we have not satisfactorily ascertained, but we believe its range is extended from the Arctic Circle to the Mediterranean, and from the coasts of Africa and India, to which southern and eastern countries it is supposed to retire during our winters. The Common Tern does not confine itself entirely to the sea, but frequently resorts to inland streams, &c. and when thus ascending our creeks and rivers these little fairies of the ocean feel.'
The Tern was formerly considered choice food. Thus, in the 'Household-book of the Earl of Northumberland' we find 'Ternes among the delicacies for principal feasts at his lordship's own 'meats,' and they are charged at four pence a dozen.

The Noddy.—Description.—In this form of tern the wings reach beyond the rounded tail. Forehead white, passing into grey-sah towards the top of the head, and into a deeper grey at the occiput, in front of the eyes a deep black patch; throat and cheeks grey-brown; all the upper and lower plumage chocolate or sooty-brown. Bill and feet black. (Summer or nuptial dress.) Length about a foot.

Geographical Distribution and Habits.—America principally, where its head-quarters appear to be the Gulf of Mexico, the coasts of Florida, and the Bahama islands.

Dr. Latham was told that they breed in great numbers—certain small rocky islands near St. Helena. Mr. Audubon observed numbers collected from the American coast above mentioned in 1832, on one of the Tortugas, called, from the flocks that visit it, Noddy Key.

Mr. Gould remarks that the noddy, unlike the generality of terns, builds in bushes on low trees, making a nest of twigs and dry grass, while hovering over or near which the old birds utter a low querulous murmur: the eggs, three in number, are reddish-yellow, with dull red and purple patches and spots, and the young are said to be very good eating. It does not take its prey like other terns, but as it skims along the water; and, when full grown, seeks its food at much greater distances from the land than the rest of the group.

Two were shot off Wexford in Ireland in 1830. Temminck states that it has been seen in France, but he had never seen it on the coasts of Holland.

Mr. Nuttall gives a lively description of its habits.

Familiar to mariners who navigate in the equatorial regions, they are so very, like the open seas to the distance of some hundreds of leagues from the land, and with many other birds of similar appetites and propensities, they are seen in great flocks, amictually following the shoals of their finny prey. They pursue them by flying near the surface of the water, and may now and then be seen continually dropping on the small fish, which approach the surface to shun the persecution of the greater kinds, by which they are also harassed. A rippling and silvery whiteness in the water marks the course of the timid and tumultuous shoals; and the whole air resounds with the clangor of these glutinuous and greedy birds, who, exulting or contending for success, fill the air with their varied but discordant cries. Where the strongest rippling appears, there the thickest swarm of noddies and sea-fowl are uniformly assembled. They frequently fly as board of ships at sea, and are so stupid or indolent on such occasions, as to suffer themselves to be taken by the hand from the yards on which they settle; they sometimes however, when seized, bite and scratch with great resolution, leading one to imagine that they are disabled only from flight by excessive fatigue or hunger.

Some have imagined that the appearance of the noddy at sea indicates the proximity of land; but in the manner of the common tern, this adventure out to sea, and, like the mariner himself, the shelter of whose friendly vessel they seek, they often voyage at random for several days at a time, committing themselves to the mercy of the boundless oceans;
and having at certain seasons no predilection for places, where the climate suits, the roving flocks or stragglers find equally a home on every coast, shoal, or island.  [Manual of Zoology.]  The vessel however is not always friendly.  Bligh found the bird a seasonable supply to himself and his famished crew in his celebrated boat-voyage after the mutiny of the Bounty [Bligh]; and Byron has improved the incident in the terrible scene  after the shipwreck in 'Don Juan.'  [Brow. vol. v. p. 156.]

TERNATE, an island in the Indian Archipelago, is traversed by 50° N. lat. and 127° 29' E. long. It is 10 mi. long and from four to five broad. It derives its reputation from the circumstance that its sovereignty is in possession of a considerable portion of the islands of Gilolo and Celebes; and on this account the Dutch have thought it expedient to form a considerable establishment on the island at Fort Orange. The northern group of the Moluccas has been called the Ternate Islands, though this island is only one of the smaller ones which belong to them, some of which are of great extent, especially Giolo.

The greater part of the island appears to be occupied by a volcano, which, according to Valentyn, attains an elevation of 3676 feet and 2 feet, or 4056 feet English, above the sea-level. The remainder of the island is very fertile, and affords rice and the other productions of the Indian Archipelago: but we have very little information on these points, as the Dutch have always excluded foreigners, and prevent the natives from trading with the neighbouring islands, lest the specie which grow on this and other islands of the group should be brought to other countries by any other channel than their own commerce; and although the English have been twice in possession of the Dutch settlement, their attention has been more directed to the great Dutch colonies than to this comparatively small establishment. We learn only from Forrest, that the inhabitants of the Sooloo Archipelago were permitted to trade with Ternate, and that they imported large quantities of different articles of Chinese manufacture, which they exchanged for rice, edible bird's nests, trepang, sharks' fins, tortoise-shells, and small pearls: they exported also a great number of lories. The inhabitants are Malays, who have embraced Islam. There are three mosques. The King, who possesses also the northern part of Giolo, and the north-eastern limb of Celebes, where the Dutch have two settlements at Manado and Gurontalu, and several of the adjacent islands, lives in great state. These countries however are governed by separate chiefs, who in many respects resemble the feudal servitude of the middle ages: but the king and the chiefs are independent on the Dutch governor of Amboyna, of which government Ternate forms a regency.

Ternate was first visited by the Portuguese in 1521, and soon after a settlement, which was abandoned in 1570, was followed by the Dutch in 1606; who, in 1680, raised the king to a state of dependence on them, and enlarged their establishment. In 1797 it was taken, together with Amboyna, by the English, who restored it at the peace in 1801: it was again taken in 1810, and again given up to Holland by the treaty of Paris in 1814.  [Forrest's Voyage to New Guinea and the Moluccas, 4 vols.; Suvorov's Voyages to the East Indies; Von Buch's Physikalische Beschreibung der Canarischen Inseln, 4 vols.]

TERNI. [Spolet.]  TERNSTROMIA CEAE, a natural order of plants belonging to the Calycose group of polypetalous Dicotyledons. As at present constituted, by Cambessedes, who followed by Lindsey, this order consists of trees or shrubs with alternate coriaceous leaves, without stipules, mostly univalved, and sometimes with pullicid dots. The flowers are generally white in colour, sometimes pink or red, and alike in all respects with those of the cactus, except the calyxes, which are generally about the same size as the corolla, and are coiled flatly around the flower, the stamens being placed closely together. The ovules are generally 4 or 6, with many lateral vessels, and sometimes with 8 or more. This order includes the Theaceae and the Camelliaceae.
Previous to his time songs, hymns, and rhapsodies had been accompanied with a cithara of only four strings (tetrachord), to which Terpander added three new strings, so as to make the cithara comprise a full octave, or, as it was called, a diapente. This new instrument took root among the Greeks, especially the Dorians, notwithstanding the various alterations and improvements that were made. Another very important instrument, which the ancients unanimously assign to Terpander, is the reduction of the ancient melo-dies to certain systems (μορφοι), which continued unaltered for several centuries. These modes appear to have been of a twofold character: he either invented them himself, or he described those which had been used in the time of Sappho. This fixing of certain tunes and melodies he is said to have effected by marks or notes which he made over the verses of a poem. In this manner he marked the tunes of his own poems. He also wrote his own poems in verse. His own poetical compositions, which, with the exceptions of a few fragments, are now lost, consisted of hymns, prosodia, and sotia. (Müller, History of the Literature of Ancient Greece, 1, p. 140, &c.; Bode, Geschichte der lyrischen Dichtkunst der Hellenen, ii, p. 363, &c.)

TERPSICHORE. [MUSES.]

TERRA DI LAVORO. [LAVORO, TERRA DI.]

TERRA CINA, a town of the Papal State, in the administration of the See of Rome, near the borders of the kingdom of Naples, and on the high road from Rome to Naples. The old town, which is built on the site of the ancient Anxur, rises in the form of an amphitheatre on the slope of the Capitel, from which a tower overlooked the ridge of Monte Lepini, leaving but a narrow strip of land between it and the sea, along which runs the high road to Naples, in the track of the ancient Via Appia. Along the road are the modern buildings of Terracina, constructed by Pius VI., and consisting of the post-house and inna, custom-house, granaries, and other structures for public use. The old harbour, which was restored by the emperor Antoninus, has been long since filled up, but remains of the mole are still visible. The town is an ill-located one, perched one above another, surrounded and overtopped by white cliffs which are seen from afar (Horace, Sat. i. 5), and intermixed with myrtle, orange, and palm trees, and with plants of aloes and cactus. Above all rise the cathedral with its lofty steeple, an elegant palace built by Pius VI., the remains of the palace called that of Theodoric, which is a structure of the fifth century of our era, and is situated on the summit of the hill, and above the sea, in the form of an old castle raised in the middle ages. The cathedral is ornamented with some fine fluted Corinthian columns, which have been taken from a temple of Jupiter now ruined. Remains of a theatre are also seen. The climate of Terracina is very mild, but in winter, but intermixed with light rains. The population of the town is 4000 inhabitants. Terracina is 56 miles south-east of Rome and 59 miles north-west of Naples. Beyond Terracina, on the side towards Naples, is a detached rock of a pyramidal form, nearly 200 feet high, one side of which was cut perpendicularly by C. Appius to make room for his road. About two miles farther is the frontier of Rome and Naples, where a military post is kept by each respective state. (Touron, Édifices de l'Église de Rome; Valery, Voyages en Italie; Calendri, Saggio Statistica dello Stato Pontificio.)

Anxur was a thriving town of the Volsci long before the Roman conquest, was taken by the Romans in the year 406 a.C., was retaken by surprise in 399, and taken again by the Romans three years after. It afterwards became a Roman colony by the name of Terracina. During the second Punic war the temple of Jupiter at Terracina is mentioned by Livy as having been struck by lightning.” (Plutarch, Brutus: xvii. 11.)

TERRANOVA. [SICILY.]

TERRAPENE. [TORTOISES.]

TERRASSON, JEAN, a French writer of the last century. He was born at Lyon, A.D. 1679: his father was Pierre Terrasson, one of the faction of the Oratory; and his mother, Madame de Cremists, active in the city, and a man whose devout temper led him to make all his four sons (of whom Jean was the eldest) members of the Congregation of the Oratory. They were all prelates: the three younger remained members of the Congregation, but Jean (now a sub-deacon) whose disposition inclined him to the life of an ecclesiastic, quitted the Society, not however without having acquired considerable acquaintance with theology. The ample and learned character which ever distinguished him rendered him the dupe of men, by whom his small patrimony was so much wasted; but he found a shelter in the house of a friend, M. Rémont, to whose son he became tutor. He subsequently resided at Paris, where he took to himself his cousin Mathieu Terrasson, a celebrated advocate in the parliament of Paris. He had become an associate of the Académie Royale des Sciences, A.D. 1707. In 1713 he made his first appearance as an author by taking part in the discussion respecting the rating on the value of Homeric Poems and the comparative merits of the antients and moderns. His work was entitled Dissertatio Critica sur les Poésies d'Homer, 2 vols. 12mo., Paris: it met with a favourable reception from those who joined in on the attacks then made on Homer, who was severely criticized. Next year Terrasson published an addition to his dissertation on Homer, in 12mo., in reply to André Dacier, by whom he had been attacked. In a.d. 1719 the financial system of the legislature was so far improved that by it the only person who was allowed to the home of a Roman or a senator's house was an individual of great wealth was to him rather a source of embarrassment that of pleasure; and when he lost his fortune the next year the financial system that place of residence was better for him a little. and in a.d. 1720 he published a small work in defence of Law's financial schemes, entitled Trois Lettres sur le Neuf Systèmes des Finances, 56 pp., 4to., Paris, and another tract, a little later, entitled A Monseigneur, the Duke of Chartres, which had saved some small part of his fortune from the general wreck; and this, with the income of a professorship which he obtained next year (A.D. 1721) in the College Royal, and a pension subsequently conferred by the government, enabled him to live after a comfortable old age. He became a member of the Académie Française in 1732.

In 1751 Terrasson published a romance in imitation of the Vicq d'Azelot, entitled Le Colonel Don Juan, 3 vols. 12mo., Paris, and professed to be a translation of a Greek manuscript. The scene is laid chiefly in Egypt. This work obtained sufficient circulation to go through several editions, of which the last was in 1813. In 1765, 12mo., but never became popular. An English translation was published in London in 1732. In the year 1737-44 he published the seven successive volumes of a translation of Diodorus Siculus. This translation has been reprinted once or twice, but is very rare. This was his last work of any consequence. He died and his bodily strength gradually failed, and he died a.d. 1750, aged 80.

He wrote also a treatise entitled De l'Isolde, a novel, which, however, was republished in six volumes, in which were included two transcripts to be taken during his life; but it was never published, nor was the original manuscript found among his papers at his decease. He left also a small work, published after his decease, entitled La Philosophie applicable à tous les Objets de l'Esprit de la raison (Paris, Br. vs., 1754).

From an anonymous letter printed, with one or two other pieces, at the commencement of this small volume and containing a biographical notice of Terrasson, we have the following summary of his life:—‘Also the Edifice of Terrasson, by D'Alembert; Quaréard, La France Littéraire, Biographie Universelle.

TERRESTRIAL MAGNETISM. This term is used to denote the action of the magnetic fluid in or about the earth; the effects of that action being manifested in the phenomena presented by magnetized needles or bars.

The general polarity of a magnetized needle when supported or suspended in a balanced state, and its inclination to the horizontal, are indications of the presence of like poles and of the direction of the magnetic lines. The magnetic force, as is well known, is produced by the effects of temperature at the surface of the earth and is determined by the intensity of the magnetic field.
of those occasional agitations in the needle, to which the name of magnetic storms has been lately applied, and which are now known to extend at the same moment over a great portion of the earth's surface.

The declination (variation) of the needle is that element of terrestrial magnetism which was first observed, and the difference of its amount in different regions, as well as the annual change at the same station, was early noticed. Dr. Halley, on his return to England after his second voyage, during which he had made many observations on the variation in different parts of the Atlantic and Pacific oceans, published, in 1701, a chart, on which were traced what have since been called isogonal lines, that is, lines passing through the points on the earth's surface where the variation was the same; and other charts of a like kind have since at different times been constructed. The expectation at first entertained, that such a chart might serve as a means of ascertaining the longitude of a ship at sea by an observed variation of the needle has not however been fulfilled, since as yet no formula has been discovered by which the variation at any given time and place may with sufficient accuracy be found: but though the changes of the variation have hitherto rendered such charts of little use for the purposes of navigation, yet a knowledge of the form of the lines of equal variation at different periods may be of great importance as a step to the discovery of the law of those changes. The latest variation chart is one which was published by Adolf Erman, after his journey, in company with Hansteen and Drew, through the whole length of the Russian empire, and his return to Europe by sea. Erman determined the positions of the isogonal lines from his own observations, and from the most authentic of those which had been made by other observers between the years 1827 and 1830; and subjoined is a representation of the principal lines on the two hemispheres of the earth, projected stereographically on the plane of the equator. The lines marked o p pass through places where the variation is zero; the positive sign before a number indicates that the variation is westward, or that the needle deviates to the west of the astronomical meridian; and the negative sign indicates that the variation is eastward. On an inspection of the chart it is evident that on a sphere they must be curves of double curvature with bends in opposite directions; that most of them converge towards two points on the earth's surface, one in or near Baffin's Bay, and the other to the southward of New Holland; and that between the inflexions there are some which return into themselves.

The dip, or inclination of the needle to the horizon, which is another element of terrestrial magnetism, was first recorded by Robert Norman [Inclination], and numerous observations have been made to ascertain its value in different parts of the world, together with the variations to which it is subject in process of time; but a general chart exhibiting the forms of the isoclinal lines, as those of equal dip are called, is still wanting. On the above cut are represented by dotted curves some of the lines which are best known; and these have been taken chiefly from the partial chart given by Major (now Colonel) Saline, in the 'Philosophical Transactions' for 1840. The data are stated to have been obtained from above 140 observations made in latitude (variation) between 1834 and 1839, and from many which were made at sea by Mr. Dunlop in 1831, and by Lieut. Sulivan in 1839. Some points have also been taken from the observations made by Erman in the Pacific Ocean. Of which last observations a table is given in the 'Seventh Report of the British Association' (vol. vi.).

\[ a, a, a \] represents the line of no dip, which is evidently a curve of double curvature, and crosses the terrestrial equator in two points at least; \[ b, b, b \] is the known portion of the isoclinal line; \[ c, c \] is the line for 60°; and \[ d, d \] the line for 75°.

An inspection of the cut will show that the oval lines of equal dip go diminishing in magnitude northwards, and the pole of the dip, or place where that element is a maximum, may be fixed at a point (P in the diagram) in long. 26° (117° west), and in lat. 70° N.: at that place, by the observations of Captain James Ross, the dip in 1831 was found to be 89° 59'. Professor Hansteen, of Christiania, has deduced, from the observations which have been made in the polar regions, that the isogonal lines in the northern hemisphere tend to two points in the vicinity of the pole of the dip; those which are on the north side uniting in a point a little way to the north of the latter pole, and those on the south side a little way to the south of the same pole.

Till within the last fifty years it was the general opinion that the intensity of terrestrial magnetism was the same at all parts of the earth's surface; and to the Académie des Sciences, in France, is due the honour of having been the first learned body which proposed that observations should be made for the purpose of determining that element. In the instructions which its members drew up for the use of the unfortunate La Perouse, it was recommended that the intensity should be observed at places very distant from one another, in order to ascertain whether or not any differences existed in its value. The accounts of any observations which may have been made during the voyage perished; but between the years 1791 and 1794, M. Rossel, who sailed from France with the expedition in search of La Perouse, determined with a dipping-needle the inclination to the horizon, and the times of performing a vibration, at different places; and from the latter the fact of a difference
The isodromal lines present the appearance of double dipole lines, and in both systems are there a like tendency to form two foci, or centres of greatest attraction; and the bends gradually become less strongly marked as the lines approach the equatorial region of the earth, but it is obvious that the lines in the northern hemisphere pass to the centre of the earth at whose distance the isodromal line 1 crosses the line of no dip in two places at least; and each of the dip-lines, \( \theta, \theta', \theta'' \), in No. 1, would pass through several of the intensity-lines in No. 2. Even within the limits of the British Isles the deviations of the two systems of lines from parallelism are very sensible ('Memoir,' by Maj. Sabine, in the Eighth Report of the British Association); and it may be inferred that, at least in the northern hemisphere, the maximum of no dip is not in the pole of the dip, the distance between them in latitude being probably as much as 20 degrees. Q and R in the cut No. 2 are the presumed places of the two intensities-poles in the northern hemisphere. It is at present quite impossible in such a situation of a problem in which there are two centres of attraction, to determine the most probable one of them without an observational test. It is most probable, from the fact that the highest observed intensities in both are equal at places (New York and Van Den even's Land) where the dips are also equal, and where they are 20 degrees of being the greatest.

Professor Hansteen, in his treatise on the magnetism of the earth (1819), has shown, from a comparison of the observed and the computed magnetic elements, that the axis of the earth is not in a straight line with the poles of the dip, and that each of them has a slow movement about the axis of the earth. Not much dependence can be placed on the computed periods of the revolutions, but Mr. Hansteen assigns for that of the North American pole 1890 years, and for that of the Siberian pole 880 years.

The existence of two magnetic poles in each hemisphere is thus evident, and Gauss of Göttingen observes that here must also be a third point between each pair, which possesses the character of both, and therefore is a true pole. Geodetic and geophysic investigations; the memoirs of Tilly's 'Scientific Memoirs,' pt. vi. This is indeed obvious: for if a dipping-needle were carried from one pole towards the other, it would begin to deviate from the vertical through the horizontal component of the disturbing force; at a point near the other, it would be found to deviate from the vertical towards the pole which it was approaching; and, as these deviations are in opposite directions, there must be an intermediate point at which the needle would assume a vertical position. Almost as soon as a few observations on the phenomena of terrestrial magnetism were collected, Dr. Halley (1701) expounded a theory in order to account for them. He observed that the earth itself might be a shell, containing within it a globe which revolved with it about the same centre of gravity and the same axis; the outer globe, or shell, being supposed to perform its rotation in twenty-four hours, and the other in a time rather greater or less. Each globe would be brought out from the common centre, but the two axes were supposed to be inclined to each other and to that of the diurnal rotation; and consequently there were supposed to be, in all, two magnetic poles.

The deviation of these magnetic axes from that of the earth's diurnal rotation was supposed to be the cause of a general variation (declination) of the compass-needle, at the slow deviation of the magnetic axes from each other. The hypothesis was supposed to concur in the continual variation of the declination which is observed at every place on the earth's surface. The theory is highly ingenious, and it were too a difficult one, but it is not susceptible of quantitative treatment; and when observations are multiplied, and the variations of the needle at considerable intervals of time were compared together, it was found to be incapable of representing the phenomena; and Mayer, of Göttingen, without gaining any advantage, modified the hypothesis by assuming that the centre of the small magnet was placed at a certain distance from that of the earth.

Subsequently (1805) M. Biot, assuming that there were two magnetic points in a supposed magnetic axis of the earth, one of which the magnetized needle was attracted by and the other repelled, investigated a formula for expressing the dip and variation in terms of an indeterminate distance between those points. On comparing the result obtained by comparison from the formula with the observed phenomena, he found that the latter were represented with tolerable accuracy when the points of attraction and repulsion were infinitely near to each other. But for the purpose of this investigation it follows that if a plane, supposed to pass through the centre of the earth perpendicularly to the magnetic axis, were considered as a magnetic equator, the tangent of the dip of the needle would be equal to twice the tangent of the magnetic latitude of the place on the earth's surface; and a like conclusion had been previously arrived at by Professor Kraft at St. Petersburg, from such observations as then existed. It is here supposed that the earth is a sphere and that the magnetic axis, or great circle of the sphere, and we have seen that this is the case. Agreement with observations, however, can be advantageously employed when it is required, from any observed dips of small magnitude, to determine the position of the earth's magnetic axis; for the value of the dip is zero. The last attempt to account for the phenomena of terrestrial magnetism in this manner was made by M. Hansteen (1811), who assumed the existence of two small magnets of unequal strength at certain distances from the centre of the earth. He compared the results with respect to variation, dip, and intensity, which he obtained by computation from that assumption, with the values of those elements observed at different places; and from the agreement or disagreement of the results, yet in several instances the differences were such as to show that the hypothesis was erroneous or incomplete.

Professor Gauss of Göttingen, in his Treatise on the General Theory of Terrestrial Magnetism above quoted, has investigated the elements independently of all hypotheses concerning the distribution of the magnetic fluids in the earth, and assuming only that the terrestrial force is the collective action of all the magnetized particles in the earth's mass, he has exhibited the resulting formula in general and particular forms, for making a table of the declination and inclination of the needle, and of the intensity of magnetism, computed from his expressions for the horizontal and vertical components of the earth's force, for any observed elements at the same places; and the smallness of the differences between these last and the computed elements are satisfactory proofs of the correctness of the theory. For a supposed connection between the temperature of the earth's surface and terrestrial magnetism, see ISOTHERMAL LINES.

The want of complete success which has hitherto attended the different attempts to exhibit the laws of magnetic phenomena make it evident that the time has not arrived in which that can be done with respect to magnetism which Newton accomplished with respect to gravitation. But though the hypotheses formed, in order to account for the phenomena of terrestrial magnetism, have been such which will enable the predictions made at times or in places not very distant from one another to be reduced to what they would have been had they been made at one time or station; and thus several observations may be considered as constituting one, it is evident that the observed elements, it must not be understood that they are therefore without utility; since the approximative rules which have been obtained from them afford means of computing small differences in the elements with sufficient accuracy to show the variations made at times or in places not very distant from one another to be reduced to what they would have been had they been made at one time or station; and thus several observations may be considered as constituting one.
In 1834 Professor Gauss discovered the fact that the synchronism of the perturbations was not confined to the declination of the needle, but the deflection at one place of observation had its counterpart at another; and he was therefore induced to recommend a plan of simultaneous observations at intervals of five minutes during twenty-four hours, four times in the year. This suggestion was immediately adopted, and magnetic stations were formed at more than twenty cities of Europe, from Dublin to St. Petersburg. The British Government and the East India Company also, besides the observations at various parts of the former, at Greenwich and Dublin, immediately sanctioned the formation of magnetic stations, under the direction of scientific officers, at St. Helena and the Cape of Good Hope, in Canada, the East Indies, and New South Wales; and in the present expedition, in the regions under the command of Captain J. G. Ross, one of the leading objects is the determination of the magnetic elements in that remote part of the world. The system of simultaneous observations at numerous and stated times of the year, which has been organized in Europe, is to be confirmed by all the British observers; and the Royal Society of London has caused an able Report of the objects of scientific inquiry in physics to be drawn up for the use of travellers in general, and particularly for the persons who have been appointed to take part in the observations respecting magnetism and meteorology.

The instruments employed for determining the elements of terrestrial magnetism, and the variations to which they are subject, are of three kinds: the declination magnetometer, the horizontal and vertical force magnetometers. The first is a needle or bar, from twelve to fifteen inches in length, nearly one inch broad, and a quarter of an inch thick, suspended in a horizontal position in a stirrup by untwisted silk fibres about two feet long. The apparatus is contained in a box, to protect it from the agitation of the air, with two apertures in opposite positions; one of these is for illuminating the scale, and the other is used for the readings, which are taken by means of a telescope at a distance. For a description of such an instrument and its adjustments, see Taylor's 'Scientific Memoirs,' part v. By this instrument may be observed the absolute declination, or the angle which the axis of the needle makes with the astronomical meridian of the place, the deviation of the declination, and the horizontal component of the earth's magnetic force. The latter is found by experiments of deflection and experiments of vibration; and the formula to be employed for the purpose are given in the work of Gauss, entitled 'Intensitas vis magneticae terrae' (1835). See also the Report of the Committee of the Royal Society, 1840. But Gauss considers that determinations of intensity by the vibrations of a needle are inaccurate on account of the changes which with the intensity itself and the box in motion. He invented a new instrument, which is called a Bifilar magnetometer, for the purpose of determining the horizontal intensity alone. This consists of a magnetized needle or bar resting horizontally, with a plane placed under it, to the upper part of which are attached the two extremities of a fine steel thread or wire. The middle, or the bend of the thread passes over two pulleys which are fixed in the upper part of the building; and the two parts of the thread hang in vertical positions, or parallel to each other, when the needle rests in the magnetic meridian. Then, on turning the whole apparatus horizontally so as to incline the needle with its axis, the force of the horizontal component of the magnetic force causes the needle to return to its former position; but if the axis of the needle be inclined at any angle to the plane of the magnetic meridian, the force of the horizontal component of the magnetic force, and every change in the intensity of the latter affects in a direct manner the position of the needle. The magnetized bar in use at the Greenwich observatory weighs 25 lbs., and the length of the pair of suspending threads is 17 feet. (Taylor's 'Scientific Memoirs,' parts vi., vii.) Instruments on the same principle, but smaller dimensions, are made for ordinary occasions. See the Royal Society's Report.

TERRIER (Canis familiaris Terrarius), a variety of the dog remarkable for the eagerness and courage which it goes to earth, and attacks all those quadrupeds which come under the gamekeeper's denomination of 'Vermin,' from the Fox to the Rat.

In the genealogical table of the different races of dogs we find the Hound immediately next in descent from the Shepherd dog, which is placed as the immediate descendant of the Lapland dog, the highest in the table, and lateral to the Hound, the Terrier, and Harrier. "Lieut.-Col. Hamilton Smith (Naturalist's Library, 1st treating on the Curs Dogs, after stating that in Sweden the number of the dog is more than one of those found in the woods of the country—Southern China, all Persia, Nautolia, and Russia is a similar predominant race of curs; and that in Europe there is everywhere evidence of an continual descent of species of small dimensions, or at least of one, brought by the earliest colonists of the west, extending from Ireland to Spain,—goes on to observe, that if we search that kind which now seems to be the most typical of possessing innate courage, sagacity, and prolific power, without training or care in breeding,—these qualities are found most unquestionably united in the terrier, and in all of them so fully marked, with all the tokens of antepassage together, that no doubt exists of the terrier being the direct offspring of the domesticated dog, or the terrier," says Col. Smith in continuation, 'we shall find in all the acuteness of innate confidence, all resources of all the willingness to remain familiar with subterraneous habitations, and all the daring and combining powers which makes him the most formidable of all the domesticated or semi-domesticated and smaller species. But it is more likely the terrier of antiquity was of the same race with the
hand-dug holes of the Cynocephalus, and that the first were begun over from the north-west of Europe with the primitive inhabitants. Certain it is that the intermixture of terrier blood with other and later races has in no instance tended to diminish their courage, hardihood, and fidelity; and in no part of Europe has the rough-haired breed retained its national character as it is known in Britain all the traits which constitute a typical species.

Terriers may be divided into two sections, the one rough and wire-haired, the other smooth-haired and generally more dainty in appearance. In courage and sagacity there is little difference if the dogs be well bred, but the rough and wiry coat of the former is a greater protection from the attack of its adversary, and it is, if anything, the more severe biter of the two. They are of all colours, red, black, grizzle, grey, and so on, but the sandy, brown pied, white, and white pied. The Pepper and Mustard breeds, rendered famous by Sir Walter Scott, are highly valued.

Every pack of fox-hounds, to be complete, should be accompanied by a brace of terriers, and one should be smaller than the other, so that if one should be stopped by a small earth, the other may enter. For terriers going with hounds, any colour is better than all red, for a red terrier was never known to catch a fox, and baled off as one by inexperienced sportsmen.

Mr. Daniel, in his 'Rural Sports,' gives the following account of the ferocity and affection of a terrier bitch:—

"After a very severe burst of more than three days by Mares Matfaff and John Heney Dovehouse, near Sudbury, in Suffolk; the terriers were lost, but as the fox went to ground in view of the headmost hounds, and it was the concluding day of the season, it was resolved to dash in at once, not to be signed over to a sporting fox, but three others were saved from her fury. These the owner of the bitch begged to have, saying he should make her suckle them. This was laughed at as impossible; the man never was positive, and had the cubs; the bitch fox was carried away and turned into an earth in another country." Mr. Daniel then relates that, as the terrier had behaved so well at earth, he some days afterwards bought her, with the cubs, and she has been highly valued. The bitch continued to suckle them regularly, and reared them until they were able to shift for themselves: what adds to the singularity, Mr. Daniel observes, is that the terrier's whelp was nearly five weeks old, and the cubs could not get out of the changed house by force. He also states that a circumstance partly similar to the foregoing occurred in 1797, at the duke of Richmond's, at Goodwood, where five foxes were nurtured and suckied by two foxhound bitches.

The same author states, that in April, 1794, his hounds found at Bromfield-Hall wood. By some accident the whippet-in was thrown out, and after following the track two or three miles, gave up the pursuit. As he returned home, he came through the fields near the cover where the fox was found. A terrier that was with him whined, and was very busy at the foot of a pollard oak, and he dismounted, supposing that there might be a hole at the bottom harbouring a polecat or some small vermin. No hole, least of all a polecat, was there, but the fox had climbed the tree, which was covered with twigs from the stem to the crown, and upon which was visible the dirt left by something that had gone up and down the boughs. The whippet-in lifted the dog as high as he could, and the terrier eagerly inferred. He then climbed the tree, putting up the dog before him. The instant the terrier reached the top the man heard him seize something, and, to his surprise, found him fast clapped with a bitch-fox, which he secured, as savoury as found out. As fox's, corals, crustaceans, and the like, are to Mr. Leigh, and used to run tame about the coffee-room at Wood's hotel, Covent Garden. The breed of terriers recommended in the old times when the huntsman went on foot, was from a Beagle and Magnel Missif, or from any small thing or dog that had courage. Thus the cost and courage were supposed to come from the Cur, and the giving tongue from the Beagle. The time for entering the young terriers at a fox or badger was when their age was ten or twelve months, or rather, an old terrier and the young fox, or the old and the old, taken, the young terriers were set to attack the cubs unassisted, and when they killed them, both young and old terriers were rewarded with the blood and liverbed with cheese, with fox or badger's grease; at the same time the dogs were shown the heels and skins to encourage them. There were other ceremonies recommended, too cruel to be repeated, and which could have been of little or no service. Honest Dandie Dinmont's mode of using his Pepper and Mustard generations is as good as can be practised.

A cross of the terrier with the bull-dog for the purposes of badger-baiting, &c., was at one time much in vogue. Of this breed was the celebrated dog Billy, famous for his destruction of rats. He was often turned into a room with a hundred of those animals, and he frequently killed every one of them in less than seven minutes.

Of those inhuman practices—it is degrading the term to call them sports—it is killing, dog-fighting and the like, we purposely say nothing here, except that they have been, most properly, put down by law in the metropolis and its vicinity.

TERRIER, from the French word terrier, a land-book, a register or survey of lands. Those best known in this country are the ecclesiastical terriers made under the provisions of the 87th canon. They consist of a detail of the temporal possessions of the church in the parish. They were made by the bishop of the parish, or the local custodian of the property, and the forms may be presumed to be genuine, it is in all instances evidence as against the parson. And in those instances where it has been signed by churchwardens elected by the parish or by the inhabitants, it is also evidence as against the inhabitants generally; even against those occupying lands other than the lands occupied by the inhabitants who signed it. The questions in respect of which a terrier is generally employed as evidence are those relating to the globe, fitches, &c. (Starkie, On Evidence.)

TERTIARY STRATA, the title given by almost universal consent of geologists to the uppermost great group of strata. It was first used in the dedication of the 'Essay on the Geology of the Basin of Paris' by Dr. L. Greville and Brongniart, in 1810, but little attention had been awakened to this great mass of deposits, though the familiar use of the terms primary and secondary, and the acknowledged dissimilitude between the latest of these strata and modern accumulations from water, in respect of mineral aggregation and organic exuviae, seemed to be prophetic of the discovery of a newer type more in harmony with existing nature.

The extent to which, over great tracts in all quarters of the globe, this type has been found to prevail, is exceedingly great: most of the capital cities of Europe are built upon tertiary strata; many of the broadest plains and the highest mountains are formed of tertiary strata, but the dried beds of seas and lakes of the tertiary period: and some considerable mountain ranges bear on their high summits, and still more abundantly on their flanks, portions of the shelly tertiary strata which were uplifted from their original horizontality and subjected to the convulsive movements of which the mountain ranges are the result. In almost every part of the globe strata of this tertiary series prevail, and yield astonishing numbers of organic remains, other remains of fresh water, and terrestrial invertebrata, and more locally abundant layers of fishes, and rich deposits of bones of mammals, &c. Possessing so many attractions, and affording such unusual facilities for study, the tertiary strata of Italy and France, England, Germany, and the United States of North America, the great tracts of Brazil, Patagonia, &c., have been the theatre of great and laborious investigations, which have brought forward our knowledge of these de-
The principle of per centage employed by Mr. Lyell in this classification should not be strongly objected to an account of its rigorous numerical results being sometimes found locally inapplicable. It is impossible that the should be otherwise, for the numerical proportions of organic life must always in the same strata, and the same conditions as well as to the general succession of physical influences; but that the great cause of the systematic variations of the forms of plants and animals in successive geological periods, whether primary, secondary, or tertiary, as the successive physical conditions under which they lived, and consequently the successive periods to which these physical conditions belonged. The comparison of individual fossil and living forms is merely one, and that not the most general or important, of manifesting the numerical constants of organic life of the several geologic periods. By some other less obvious arithmetical processes, the relative analogies of extinct and modern nature may be made to appear numerically, independent of the specific combination of geological age or geographical region. This has been attempted in regard to the Palæozoic fossils generally, and to the fossils of Devonshire specially, and the result affords remarkable confirmations of the general calculations based on exact data representing the numbers of distinctly recognizable forms of different groups of organic remains, whether these be of living or extinct tribes.

We have only further to remark, that the tertiary strata are far more distinctly defined and separated from the uppermost secondary strata than from the recent deposits of water. In fact the most natural classification of tertiary volcanic products, tertiary strata, and tertiary accumulations, and from the living creatures is as such is witnessed in daily operation: they contain marine, littoral, and pelagic deposits; ancient and fluviatile sediments; lacustrine beds hardly distinguishable from each other as are now in progress. In these sediments occur remains of a system of terrestrial and aquatic life as complete as we except reasoning man as that now in activity and the absence of man, and the animals which seem to be most closely associated with the living types of the actual creation, be thought a sufficient reason to remove from historic time the account of tertiary deposits, and to justify the adoption of a distinct quaternary or modern period. 

Some assistance towards the desired classification appears to be derived by the alteration of marine and freshwater sediments, as in the Isle of Wight, and in the basin of Paris, and hence the titles of Upper and Lower Marine, Upper and Lower Freshwater deposits acquired a considerable application. But the most successful and probably best-founded classification of tertiary strata rests upon a study of their organic contents.

It has been long remarked that in those strata, wherever they occur, the forms of animal and vegetable life make a new and specific division of living types. By careful examination, a certain number of species have been found in tertiary strata actually identical with or undistinguishable from living objects. The proportion in which these are found, if species are mixed with now extinct (or believed to be extinct) forms varies, so that in Sicily tertiary beds occur with about 90 per cent. of still living species of shells, but in the basins of London and Paris others are found containing only about 5 per cent.

There are reasons independent of these proportions which leave no doubt that the strata near London and Paris, which contain only 5 per cent. of living forms, are among the oldest of tertiary beds; while the Sicilian beds, which contain only about 5 per cent. of extinct species, are amongst the most recent.

Views of this kind generalized lead to a speculation which is strongly confirmed by the general current of geological discovery, that the relative antiquity of tertiary strata may be judged of by the relative proportion of extinct species of shells which are found in them. On this postulate M. Deshayes and Mr. Lyell have founded the most prevalent modern classification of tertiary strata, which may be thus briefly sketched.

Recent Period.

Newer Pleocene Period, the strata containing not above 10 extinct species in a hundred.

Older Pleocene Period, the strata containing about 50 or 60 extinct species in a hundred.

Miocene Period, the strata containing about 80 extinct species in a hundred.

Eocene Period, the strata containing about 90 extinct species in a hundred.

Secondary Period.

These terms are taken from the Greek ἐνωκός, recent combined with ἀνίκος, more, πιον, less, and ἄκρον, the dawn.

The principle of percentage employed by Mr. Lyell in this classification should not be strongly objected to an account of its rigorous numerical results being sometimes found locally inapplicable. It is impossible that the should be otherwise, for the numerical proportions of organic life must always in the same strata, and the same conditions as well as to the general succession of physical influences; but that the great cause of the systematic variations of the forms of plants and animals in successive geological periods, whether primary, secondary, or tertiary, as the successive physical conditions under which they lived, and consequently the successive periods to which these physical conditions belonged. The comparison of individual fossil and living forms is merely one, and that not the most general or important, of manifesting the numerical constants of organic life of the several geologic periods. By some other less obvious arithmetical processes, the relative analogies of extinct and modern nature may be made to appear numerically, independent of the specific combination of geological age or geographical region. This has been attempted in regard to the Palæozoic fossils generally, and to the fossils of Devonshire specially, and the result affords remarkable confirmations of the general calculations based on exact data representing the numbers of distinctly recognizable forms of different groups of organic remains, whether these be of living or extinct tribes.

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bible reason for it is found in the character of Tertullian himself. In his writings composed before his Montanism he shows many traces of that zeal and asceticism which formed the peculiar characteristic of the Montanists. It has been doubted whether he remained a Montanist to the end. Some have thought that he returned to the catholic church, and others suppose that he at last settled down into opinions intermediate between those of the Montanists and those of the orthodox. For neither of these suppositions is there any sufficient proof. There existed indeed at Carthage, the city to which he had returned, a church in which he is said to have taught, but among these there appears to have been no historical connection.

Whether he remained a Montanist or not, he continued to write works which have come down to us. Some of these, for instance, deal with the Jewish church, and are of a chrestological character. In fact it is to his influence that we must trace the characteristics which distinguished those churches from other churches, and which at length, through Augustin, gave a tone to the Christianity of the West. His influence was especially great upon Cyprian, in whose writings there is much which closely resembles some of Tertullian's, and of whom Jerome says that in asking for the works of Tertullian he was wont to say, 'De magistrum' ('Give me my master').

The date of Tertullian's death is unknown, but we are told by Jerome that he lived to a great age. One of his works ('Ad Scapulum') was written as late as 216 A.D.

A large portion of his works have come down to us, and the date of some was ascertained after he adopted the opinions of Montanus. (J. G. Hoffmann, Diss. omnia Tertull. in Montanismo scripta videri, Wittenberg, 1738.)

1. Of Tertullian's Apologetic Works the following appear to belong to the latter part of his life and to have been written in the reign of Septimius Severus. They are free from the peculiar tenets of Montanism:

(1.) 'Ad Martyres;' for the encouragement and vindication of those who suffered for being Christians.

(2.) 'De Spectaculis;' written about 196, against the Roman games and festivals, and to dissuade Christians from being present at them.

(3.) 'De Idololatria;' an exposure of the character and influence of idolatry, with an exhortation to Christians to avoid it.

(4.) 'Apologeticus adversus Gentes pro Christianis;' his principal work of this class, and one of the best of all his works. It is a powerful refutation of the accusations made against the Christians, and especially against the Montanists, against the persecutions they suffered, addressed to the Roman magistrates. It was written in the year 198, and has been deservedly held in very high esteem both in ancient and modern times.

(5.) 'Ad Naiones Libri II.' These two books, which were discovered in manuscript by James Goffredo, and printed by him at Geneva, 1625, 4to., form a kind of supplement to the 'Apologeticus.' The first contains much the same matter as that book, sometimes expanded, sometimes condensed; but the second takes up the general subject of heathen theology. The date of these books appears to be about 199, if they were written after the 'Apologeticus,' but some writers of high authority, as Neander and Miëter, suppose that they were written before the latter work, in the year 198.

(6.) The treatise 'De Testimonia Animae' may be regarded as another supplement to the 'Apologeticus,' the 17th chapter of which contains in fact the same argument in a short form. It has been here inferred that there exists originally in the human mind, to a certain extent, a knowledge of the true God, and that this knowledge of God confirms the Christian doctrine of his character.

The remainder of Tertullian's apologetic works appear to have been written after he became a Montanist. They are:

(7.) 'De Corona Militis;' a vindication of a Christian soldier, who refused to wear a crown which had been awarded to him, on the ground that it was a badge of heathenism, and who was imprisoned for his refusal. This work contains remarks on other questions relating to the duties of a Christian citizen under a heathen government.

(8.) 'De Puger in Testamentum,' a statement of the Montanist opinion that Christians, when persecuted, might neither attempt to save their lives by flight nor by money.

Written about 202.

(9.) 'Contra Gnosticos Scorpiae,' an answer to the alarms thrown out by the martyrs in the persecution of Septimius Severus, by those scorpiones the Gnostics.

(10.) 'Liber ad Scapulum;' a defence of the Christians, addressed to Scapula, the proconsul of Africa, who persecuted them.

II. Practical Works, relating to Christian morals and discipline. The following were written before he became a Montanist:

(11.) 'De Patientia;' on Christian patience.

(12.) 'De Oratione;' on prayer: one of Tertullian's earliest works.

(13.) 'De Baptismo;' on baptism: a defence and explanation of the rite.


(15.) 'Libri Duo ad Uxorem;' exhorting his wife not to marry a second time, if he should die before her.

The two following works were, in Neander's opinion, the most probably written after Tertullian became a Montanist:

(16.) 'De Cultu Femeninarum;' on female attire: consisting of two books, the first of which is sometimes denoted by a separate title, namely, 'De Habitub Muliebris.'

(17.) 'De Virginitate;' recommending the practice of virgins: in opposition to the custom then prevalent at Carthage, of virgins appearing in church with the face exposed.

The remaining works of this second class are undoubtedly Montanistic:

(18.) 'De Exhortatione Castritatis;' dissuading a friend from marrying a second time. To the same purport are

(19.) 'De Monogamia;' and (20.) 'De Pudicitia.'

(21.) 'De Jejunitate;' or 'De Jejunia;' recommending the severer practices of the Montanists, in preference to the milder doctrine of the orthodox respecting fasts. In this work, and others of his writings, he applies to the orthodox the term 'psychic' (ψυχες), carnal, which is used by Paul (1 Cor., ii. 14) in opposition to 'spiritual.'

(22.) 'De Pallocanis;' composed in the year 208, is a treatise recommending the wearing of the Greek pallium in preference to the Roman toga. It contains much information respecting the form of these garments.

III. Works on Christian Doctrine and Polemics. The only one of this class which seems to have been written before his Montanism is

(23.) 'De Praescriptione (or Praescriptionibus) Haereticorum;' against heretics in general, and especially the Gnostics and Marcionites.

He continued his attacks upon the heretics, and especially the various sects of Gnostics, after he became a Montanist, in the following works:

(24.) 'Adversus Marcionem Libri V.'

(25.) 'Adversus Valentinianos;' which Semler supposes to be a close imitation of Irenaeus, 'Contra Haereses.'

(26.) 'De Carme Christi;' and (27.) 'De Resurrectione Carnis,' are treatises on the resurrection, in opposition to the Gnostics.

(28.) 'Adversus Hermogenem;' against the doctrine held by a Gnostic of that name, that matter is eternal, and that out of this eternal matter not only all sensible things, but also the souls of men are made, the latter being besides endowed with a divine principle of life (σωματον). Against this doctrine concerning the soul Tertullian wrote another work, from which only some quotations have come down to us: 'De Cenou Anima.' Our loss is the less, as we have a fuller treatise by Tertullian on the same subject.

(29.) 'De Remissione Sins;' which contains the views of heathen philosophers concerning the soul, and opposes to them all the doctrines of Christianity, that it is spiritual, immortal, and received direct from God.

There is also a work by him on the doctrine of the Trinity.

(30.) 'Adversus Praxean;' written about 204 or 205, against the doctrine of Praxean, which was in fact essen-
tially the same with that which afterwards became known as Sabellianism.

In the latter part of his life he wrote a work, (31.) 'Adversus Judaeos,' in answer to the Jewish objections against Christianity.

The above list contains all the extant works of Tertullian, but he must have written many more, since Jerome informs us that many of his works were burnt by Julian. Of those already known, the most famous is 'De Duce Animae,' already mentioned, are some which were especially designed to explain the opinions of the Montanists. Among these is 'Tertullianus,' one of the earliest works, in which was put forth the doctrine now known as Millenarianism, of the personal reign of Christ on earth for a thousand years [MILLINNIIUS], and 'De Paradiso.' He also composed a defence of the 'cæstæs' of the Montanists, which was named after certain Apollonius. His treatise 'De Aaronus Vestitus' appears to have been lost before Jerome's time. (See Hieronym., Epist. 454., near the end.)

'Two works which are sometimes erroneously ascribed to Tertullian are the 'Carmina Sibyllina,' and the 'Acta Perpetuae et Felicitatis.' Tertullian holds one of the first places, if not the very first, among the Latin fathers, for learning and intellectual power. Even those to whom his system is remote and to whose judgment the mere learning and style are not the highest terms. Thus Jerome says (Epist. Ixx, sec. 5), 'What more learned, what more acute than Tertullian? whose apology and books against the heathen emperors the orthodox fathers (Christianity, (Commonitor., c. 24) adjudges to him 'by far the highest place among the Latin fathers,' and attributes to him 'the most extensive learning both in things divine and human, and a grasp of mind which comprehended all philosophy, all sects of philosophers, their authors and supporters, and every variety of historical and scientific knowledge.' Erazmus calls him 'by far the most learned of all the Latin theologians,' (Prophat. ad Hilar.) In short, the general judgment of the orthodox in ancient and modern times, still hold up the name of Tertullian with the highest estimation. His writings are a mine of iron and coal, which are not yet extensively worked as they might be. The inhabitants in general manufacture woollen cloth, linen, and woolen-wares. The circle contains the duchies of Teschen and Beilr., and several inferior lordships. (Briar.) The duchy of Teschen is a small state of Bohemia, whose native language is Bohemian. After the death of Jerome: a new duchy was created, the title of Duke of Teschen. Prince Albert of Saxony, he took the title of Duke of Saxe-Teschen. Prince Albert dying February 10, 1822, without lineal descendants, the duchy was inherited by the Archduke Charles, who governs it under the sovereignty of Austria.

TERTULLIAN, a circle of Austrian Silesia, is bounded on
the north by Prussian Silesia, on the east by Guben, on
the south by Hungary, and on the west by Moravia. Its
area is stated by most authors at 780 740 78 miles; (alone, we believe makes 
1360 square miles. The number of inhabitants is about
180,000. The country consists entirely of mountains and
valleys, but especially in the south, where the Carpathian
chain commences. The northern part is flat; but towards
the south, with many small lakes or meres, so that it is not well
adapted for tillage. The Oder forms for a short distance
the north-western boundary towards Prussian Silesia, and
the Ostravitz divides it on the west from Moravia. The
river Spilja, which rises in the Hungarian part of the
circle has many forests, and consequently timber is
abundance; fine pastureage; and a good breed of horses,
horned cattle, and swine. The inhabitants raise some
oats and rye, and a great quantity of potatoes. There are
mines of iron and coal, which are not yet extensively
worked as they might be. The inhabitants in general
manufacture woollen cloth, linen, and woollen-wares.

The circle contains the duchies of Teschen and Beilr.,
and several inferior lordships. (Braun.) The duchy of
Teschen is a small state of Bohemia, whose
language is Bohemian. After the
death of Jerome: a new
duchy was created, the title of
Duke of Saxe-Teschen. Prince Albert dying February 10, 1822,
without lineal descendants, the duchy was inherited by
the Archduke Charles, who governs it under the
sovereignty of Austria.

The capital of the circle and the duchy, 

situated in 49° 40' N. lat. and 18° 32' E. long., at the
foot of a gentle eminence, an offset of the Carpathians, on
a peninsula, or tongue of land formed by the river Elza or
Olsa, and a small stream called the Bober or Bobrek.

The town has three suburbs, which are not separated from
it by walls or gates: the streets are in general broad and
straight, a great fire in 1789, before which it resembled
an irregular dirty Polish town, having given an opportunity
to rebuild it in a better style; there are still however some
narrow and steep streets. There are four Roman Catholic
churches and one Lutheran church; the last is a very
large and handsome edifice. The Oberrng is a regular square
or rather octagon, in which is a large building with a lofty
tower, at the back of which is a theatre and concert-room.

Teschen is the seat of all the
courts of justice and public offices of the circle and
the duchy. There is a Roman Catholic parish church,
with a library of 12,000 volumes, and collections of
minerals, insects, and medals; and a Protestant gymnasium,
and several schools. The inhabitants, now 7000, manufacture
fine broadcloths, kerseymere, leather, and a kind of muskets
known as 'Durnau.' They are also mentioned by the name of
the Swabians, and are a considerable trade in leather, wool,
broadcloths, Hungarian wines, honey, and wax.

The treaty between
Frederick II. of Prussia and the empress Maria Theresa,
which terminated what is called the war of the
Barbary succession, was concluded at Teschen in 1779.
TESI, MAURO ANTONIO, or, as he is sometimes called, TESSERI. After the name given him by his patron and admirer, Algrotti, Morettini; Orbisonius; Stralsund. 11.) that the emperor Maximilian made him a present of the territory of Modena, January 15, 1730. Though in poor circumstances, his parents were so desirous of giving him a good education, that they removed for that purpose from Mantua to Bologna. Four years after he entered the University of Bologna, he began to study at the age of fifteen, and he was soon considered more than is due to one who set an example of more refined and purer taste in architectural design and composition. His productions are highly esteemed, and one of which he is very proud is a series of drawings, and also a series of architectural plates engraved by himself. (Tiraboschi, Bibl. Modenese; Lanzi, Storia Pittorica.)

TESSERA, a small cube or square resembling our dice, which was originally used in Bologna, by the queen Eleonora of Sweden, and according to Ortenburg, consisted of different materials, as marble, precious stones, ivory, glass, wood, or mother-of-pearl. Such small tesserae of different colours were used to form the mosaic floors, or pavements in houses, which were hence called tessellae pavimenti. (Sueton, Caesar. 16.) The same kind of cubes, usually made of ivory, bone, or hard wood, and marked on all their six sides, were used by the ancients as dice in games of hazard, just as in our own times. At least three dice were used in a game, but afterwards only two.

The word tessera was also employed to signify any token which was given to persons by which they might recognize one another. In this case however the tesserae were probably of a more elaborate nature, and accordingly consisted of different materials, as marble, precious stones, ivory, glass, wood, or mother-of-pearl. Thus we find mention of a tessera hospitalis, which strangers when forming a connection of hospitality gave to one another, that they or their children might afterwards recognize one another, and it appears that a tessera in this case was marked with the figure of Jupiter hospitalis. (Plautus, Poenul., v. 1, 25; 2, 57; Ec.) Tesserae frumentariae, or nummariæ, were occasionally given at Rome to the poor to serve as a token or ticket, on the presentation of which they received a certain amount of coin or money. (Sueton, Aug., Aug., 11.) The Roman soldiers also, before they commenced a battle, received a tessera containing the watchword by which they recognized their comrades, and were enabled to distinguish them from strangers. (Virgil, Aen., v. 627, with the note of Servius.)

(Dictionary of Greek and Roman Antig. 'Tessera."

TESSEIN. There are three eminent Swedes of this name, the father of the last is called Tessin the elder, or Tessinus Valentinus Tessin, was born at Stockholm in 1691, and held the appointment of royal or crown architect, which was conferred upon him by Queen Christina in 1648, then vacant by the death of Simon de la Vallee. In 1718, he was promoted to the position of general in the service of Sweden. That he visited Italy, that a patent of nobility was granted to him in 1674 by Charles XII., and that he filled the office of magistrate at Stockholm. Even the time of his death is not precisely stated, but it appears from collateral evidence to have been somewhere about 1688. As an architect one of his chief works is the palace of Drottningholm, begun by him for the queen-dowager Hedwig Eleonora (widow of Charles Gustavus), but completed by his son. He also was one of the commissioners of State for the establishment of the University of Charles Gustavus. In fame he has been surpassed by his more eminent son, Count Nicodemus Tessin, who was born at Nyköping in 1654, and has been called the father of Swedish historians. He was the son of Maria Eleonora, widow of Gustavus Adolphus II. He was carefully educated by his father, expressly with a view to his future profession. As soon as he had completed his studies, first at Stockholm, afterwards at Upsala, he was sent to Italy in 1674. He accompanied the Marquis del Monte, a nobleman in the service of Christina of Sweden. He studied at Rome under Bernini, and acquired a taste for the fine arts generally. After four years thus spent, he visited Naples, Sicily, and Malta, and again returned to Rome, where he received from Sweden his appointment as future hof-architect in 1689. On his return he was allowed, by Charles XI., to prosecute his travels conformably with his earnest wish for further improvement. At the time he visited Holland and France, in which latter country he remained three years. On finally settling in his native country, he received, in addition to his former appointment, that of city-architect to the magistracy of Stockholm. The destruction of the Old Palace, altered to St. Peter's church of Rome, had afforded him an opportunity for displaying his ability far more favourably than might else have offered itself; and of which he so well availed himself as to render the new edifice one of the noblest of its kind in Europe, though not what it would have been had it been carried out. He was marked, especially, for the opportunities of exhibiting his taste on a magnificent scale; but unfortunately they were only a temporary nature—on occasions of splendid court pageants, and festivals, in which his talent for architectural decoration was employed. One of them was at the solemnization of the public election and coronation of Ulrica Eleonora, the wife of Charles XI., who was herself an artist, and displayed considerable proficiency in portrait-painting. By the queen-dowager Hedwig Eleonora, he was appointed master of the remote and distant one of Drottningholm, but to lay out the grounds and gardens both there and at Ulriksdal. Besides the cathedral at Calmar, and Oxenstiern's monument, he executed or designed a great number of other buildings, including a project for rebuilding the palace at Copenhagen, which was partly carried into effect, many years after his death, when it was curtailed, and by no means improved in other respects. Elevations of the original design were published by his son, under the title of Facies, and for his return to his professional occupations, the count (which title was conferred upon him in 1714) was engaged in many offices that he held at court, and he took a considerable share in public and political affairs. At the time of his death (1725) he was chancellor of the university of Lund. Count Nicodemus was twice married.

COUNT CHARLES GUSTAVUS TESSIN, the son of Count Nicodemus by his first marriage, was born at Stockholm in 1686. Though not without talent for architecture, which he had considerably improved by travelling, he did not exercise it professionally, except in completing the palace at Stockholm after his father's death. His claim to celebrity was of a very different kind; it was as a statesman and diplomatist that he chiefly distinguished himself. He was ambassador at the court of France from 1739 to 1742, and president of the chancellorcy from 1747 to 1752. As tutor to the prince-royal, afterwards Gustavus III., he wrote for his instruction a series of letters on political and moral topics, which were published, and of which there is a French translation. Count Gustavus was a zealous promoter of every scheme for the advancement of his country; he did much for the encouragement of arts and manufactures, and for the advancement of literature and science. His most important work was the Academy of Sciences in Stockholm, founded 1735. Some years before his death he withdrew from public business and affairs, and lived in retirement on his estate at Akero in Svedemana, where he died in 1771; and by his death the family became extinct. (Weinich, Kunstlexikon, etc.; W. Svenka Närslundiga Svena Män; Ehrenström, B. Artis en Suede; Biogr. Univers.)

TESTACELLUS, the name of a genus of testaceous pulmoniferous mollusks. For the views of authors as to
its place in the system, see the article Limax. Mr. J. E. Gray arranges it between Plectrophorus and Helix, under the Helicoide, his second family. It is contained in the book of Genera Character.—Animal elongated, cylindrical form, acuminate at each extremity; no cucum; head distinct, furnished with four retractile tentacles, of which the posterior are the longest and carry the eyes; foot long and rather indistinct; pulmonary cavity situated at the posterior fourth of the animal's length, its orifice placed entirely backwards, under the right side of the apex of the shell, the anal aperture is very near it; organs of generation united, and showing their orifice near and behind the greater part of the tentacles.

Shell external, solid, subquadrate, depressed, with the spine more or less projecting, having a very large and oval aperture; the right lip simple and truncate, the left convex and reflected; the shell covers the posterior part of the pulmonary cavity.

The number of species given by Lamarck is one only; and though M. Deshayes in his Tables makes the number two (both recent), one only is recorded in the last edition of Lamarck. Mr. G. B. Sowerby figures and describes three;—Testacella heliotidoides, Scutulum, and Maugei.

History, Habits, &c.—This form appears to have been first noticed by M. Dugue, in a garden at Dieppe in 1740; but it does not seem to have attracted much attention till M. Maugé, some years since, furnished various specimens from the island of Teneriffe. It has also been found, says Mr. Sowerby, in several parts of France, and in Spain, and more lately in a garden at Bristol. Some specimens from the last-mentioned place have been handed to us by Mr. Miller of that city. It feeds upon earthworms, having the power of elongating its body to such a degree that it is able to follow them in all their subterranean windings: we have observed them attentively, and were rather surprised that an animal generally so extremely sluggish in its motions, after discovering its prey by means of its tentacula, thrusting from its large mouth its white cremulated revolute tongue, should instantly seize upon with extraordinary rapidity, and firmly retain, so earth-worm of much greater size and apparent force than itself, but which by its utmost exertion is unable to escape. Mr. Sowerby adds, that De Férussac and Cuvier consider this to be the only carnivorous terrestrial mollusk. De Férussac remarked that the simple, gelatinous, con-tractile mantle of the animal, hidden habitually under the shell, is divided into many lobes capable of enveloping the whole body by an extraordinary development, when the animal finds it necessary to protect itself from the consequences of too great dryness.

Localities.—Testacella heliotidoides inhabits the South of France; Test. Maugei is an inhabitant of Teneriffe, but naturalized at Bristol; and Test. Scutulum, which was discovered by Mr. Sowerby in a garden at Lambeth, may, in the opinion of Mr. G. B. Sowerby, be considered as a native of this island.

TESTAMENT. [WILL.]

TESTAMENT, OLD AND NEW. Some critical disputes have arisen respecting the meaning of the word Testament, as applied to the Canonical Scriptures. These, under the name of the two Testaments, comprise the revelations of God to man, which, being imparted under two principal conditions—the Law and the Gospel—are divided into two corresponding classes. The word thus translated by covenant is the Hebrew berith, so used in the first division of the sacred writings, and rendered in the Greek by diatheke. But a further notion than that conveyed by the word itself is attached, and an allusion is also made to the original of the ordinary designation of the two persons of the Scriptures, the Old and New Testament, as more appropriate designation than that of the New Testament applied to the successive revelation to the Jewish nation, the old testament to the books of the Old was defended by St. Jerome (among other authorities of equal weight), on the ground that 'Testamentum non voluntatem dumfessorum sed pactum viventur.'

The old covenant or covenant was originally referred to by the Almighty with Abraham (although, to speak strictly, the outline of it was given on the fall of man. The history of the religion of the Old Testament subsisted in the covenants made by Abraham, among which the covenant of the Son of God was most fittingly contemplated under two principal views:—the knowledge of a Revelation from God, and the connected work, and in its subject-matter; and the attributes of God, so manifestly and at the same time so harmoniously manifested. Ancient prophecies are supposed to have been the first discovery of it in Profane, and the conclusion of it in the book of Malachi, directed to one point. In its course it had multiple and various aspects, and created an authentic record of God's providence and government to be committed to the world. But its main and its latest use was in the preparatory revelation of Christ. (Davison.)

Thus the Old Testament is taken up, as we have observed, the progressive declaration of the attributes of God. There is observable throughout the books of the Old Testament a moral, as well as a Christian revelation, in the manner and under the latter, the division was, according to the Patriarchal and the Mosaic covenants do not express any model of the law of righteousness whereby man can serve his Creator, as the later revelation given by the Prophets. (Ibid.)

The office of the Old Testament was the preparatory revelation of Christianity. Its one great lesson opposed or implied, was that of the indwelling rat depravity, and weakness of man. How deeply rooted human conviction was this feeling, may be estimated by the universality of sacrifice for sin, and reliance on mediatorial ministry of a priesthood. Their ruin and weakness, and consequent estrangement from God were exhibited to the Jews by the sin offerings of their past, and by the service prescribed to receive the ordinary men, but at those of his especially spiritual servants. Nor were even these favoured servants set free from the lurking infection of their race by the grace before whom the very heavens are not clean. They became the nearest access to God; the high priest (that awful and mysterious functions) the Holy Place was closed, save on one day under certain restrictions. So clearly they did divinely appointed, law show forth to the Jews their race and the necessity and difficulties of a reconciliation, God, which other nations saw few hardly, although we were destitute of some glimmerings of the truth. But Jewish nation went a step beyond others. All received in practice the necessity of sacrifice and a priest, but the people of God stood alone in this,—that they be hopefully forward to a time when the law which high priests of men having infirmity should cease, and the period be put to the daily ministry and offer daily sacrifices, which can never take away sin. As was coming, when the words of God's messengers were fulfilled respecting a more copious diffusion of the knowledge of the Lord. And all this was wrought in him we were at one offering and priest, God and man, man, Jesus Christ.

This great doctrine of Christ's stonement, and man's to mankind, form the end of the types, the priests and the sacrifices of the Old Testament. The Old Testament, under the name of the sacrifice and priesthood, is the present age, all sacrifice and priesthood in the great and enduring covenant of the Son of God. Christ entered in once into the Holy Place, having obtained eternal redemption for us, leaving behind him, to the faithful, boldness to enter the holiest by his blood, by a new and living way, and in the Spirit.
Christianity, or the religion of both Testaments, is that
abrupt course of life which rests upon a conviction of
his necessity of the redemption of the world, and of the
reality of a personal redeemer—Jesus Christ. Hence the
neacquity of various terms employed for the
synonymous with Christianity (such as the religion of
moral conduct; a practical belief in immortality and
retribution; or the worship of God according to the pattern
given to Adam and Aaron). None of the religions to be found in
the world at the birth of Christ can claim alliance with Christianity, save
that one which alone has any pretensions to be regarded as
historical and positive, and which was directly directed to
the world of the world's Redeemer. * Nor are the reasons of this
difficulty to be traced, the conviction of the need of redemption turns the mind
upon the conviction of sin; sin leads it to the considera-
on the law broken and violated; and this last con-
verts it up to the original destination and capability of
sanctification and its relation to God; and nowhere are these steps
be traced so clearly as in the Law and the Prophets—the
writings which contain the fullest account of the existing
sanctification and promised remedy.

It is true that heathenism served in some sort to prepare
the way for Christianity. This is clear from two facts:

1. As with the heathen converts adopted the tenets
of Christianity; and theology was more advanced by the
early Christian apologists than the heathen, which
furnished the brightest gems of heathenism, and their
pure faith. But this preparation was merely
negative. Heathenism did no more than point out contraries
theological code for humanity, the
affirming andCOM, and wishes which it could not gratify. All positive
preparation for Christianity and the subject-matter of revelation
belongs to the Old Testament exclusively.

The knowledge of the subject-matter of the Christian
neces was drawn from one source, and not exclusively, apostolic
addition, as preserved to us in the sacred writings of the
New Testament. From these alone authoritative instruc-
tion is derived. An analytical outline of the system of
theology of Christ, as endorsed by the apostles, may be
divided into two portions, respectively comprising the periods of
the antecedent and subsequent to the coming of our Lord.

In considering the ante-Christian period, the attention
should be divided between Judaism and heathenism, or in
other words, between man under the law of God, and man with-
out this law—the two great classes into which the human
race was divided subsequently to the publication of the
Ist Testament.

But although different in many particulars, the
other two are included under one general point of
resemblance, the law of observance, the
Jewish and the Gentile.

From this helpless condition of man the mind reverts to
the point whence this dominion of sin and death, inse-
parably united, dates its commencement. But here a
second step is taken in the imputed righteousness of Christ, and
essentially in itself, and among those who, like the Jews, possessed a
knowledge of the will of God? The considerations arising
on this, the relation of sin and death to the law, lead
to the conclusion that the commandment which was or-
dained unto life was unto death. The law, according to
Paul, so far from affording deliverance from sin, or pro-
longing sanctification, was the means of aggravating both
condemnation and guilt. This is still further illustrated
of the former dispensation, that the law can
never make men holy or happy in the sight of God. Being
so, why was it given at all? The answer is, that it be-
garded as the plan by which God designed to make man
able of redemption through Christ. To establish the
certainty of such redemption, to impress upon men a con-
ciousness of the need of it, and to kindle a longing for it in
each heart, is the object of the period anterior to Christ.

Accordingly a survey of the state of the human race
decades are laid down by St. Paul, that the law could not
have the need of a redemption. The heathens lived in vice,
without knowledge of God, serving idols. Their standard
action was little higher than that afforded by earthly
divine, few traces remaining of a higher knowledge.

Through redemption, the difficulties which characterized
the antediluvian period (and more especially the Jewish
portion of it) were removed, and God and man reconciled.

The statement of the conditions and accomplishment of
this reconciliation leads to the consideration of the new
and holy life arising from it.

The primary source of a commencing point of the whole
scheme of redemption is God. According to his eternal
council, God decided on reconciling to himself a world
which had become alienated from him, and on rescuing
such a race of Adam and Christ, to which they were
hastening. This decree God had made with his
prophets. An evidence of his truth and faithfulness
was supplied by its accomplishment. The instrument of this
was the mission of his Son, according to the eternal pur-
pose, to be the ransom of the world; that in due time he might gather together in one all things in
Christ, both which are in Heaven and which are in earth.'
This mission of the Son, from which the newer period,
that of Christianity, dates, coincides with the time when
heathenism and Judaism may be said to have filled their
appropriate spheres of moral action. Although no dog-
matic system, technically speaking, is to be found in the
writings of the New Testament, two points immediately
relating to the person of Christ are brought prominently
forward throughout. The first of these is his claim to
divine honours as the Son of God; the second, his meri-
torious course of action, of which the crowning point was
his death, to which his resurrection was the glorious
gospel, and the prostration of completeness with which his
office had been discharged.

The object of our Lord's earthly life was rather a course
of blameless and exemplary action than the delivery of a
comprehensive system of theology. Hence the
hortatory portions of St. Paul's Epistles allusion is made to the
excellencies exhibited by Christ, the mode 'of becoming like him' was conceived in a spirit far deeper than that of
more moral imitation. It is described as a putting off the
old man, and being clothed with Christ; as the
influence of Christ, and as rising again with him. Such expres-
sions arise necessarily from the inseparable connection,
laid down in the New Testament scheme, between the death and resurrection of Christ, as the foundation of the
justification of man in the sight of God.

The doctrines of repentance and a holy life implied in
these characteristics of the new covenant are essential
conditions on the side of the human party to the contract.
This is the sum and substance of the Sermon on the Mount,
which stands at the entrance of our Lord's earthly ministry,
a fit entrance and portal to the temple which lies beyond, and
an unfolding of the spirit and pure meaning of the law under which Christ came to live and suffer. A better
observance of this precept has often been the object of
perversions which have risen up from the earliest times.

One garment, and one only, will make men meet for
Heaven (the wedding garment of Christ's parable), which
was of Christ, the fellow servant for the children of 
and, but while the human race exists, the essential rules of that law which Christ came to satisfy will be binding, and men will find their trust
please and prosperity in obedience to its spirit. Christ came
to found a new kingdom. Accordingly he opens his first
discourse by describing the members of it, their condition
and prospects in the world. And yet his kingdom was not
so much a new one, as a fulfilling and spiritualizing of the
former dispensation; for which reason the second part of
his sermon is taken up in expounding the law of Moses,
and its real obligations, and, in the words of Robert
Hamilton, 'in animating its spirit, and in filling up or directing its
practice.' But essential to a due fulfillment of the condi-
tions of this law 'must be reckoned the assistance or
guidance of God's holy spirit, as the chief of all aids, and
which contains all others. And because this cannot be
understood without admitting that the Holy Spirit is omni-
present, all-sufficient, and all-powerful, it is necessary to
the divinity of the Holy Ghost is a fundamental article of
the Christian covenant." (Latham, Harmonia Paulina.)

Christian Society forms the second part of the theolog-
ical system which may be extracted from the New Testa-
ment, and comprises the true nature of the human com-
unity, its gradual progress and necessary conditions, the
relation of its members to each other, and their unity in
the spirit. We cannot fail to observe, according to
Hammond, 'from the interchangeable mode of the great
described by Christ in the opening of the Sermon on the

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MOUNT, that to God belongs the chief and first of our love and obedience, yet so as not to exclude, but require the submission of the whole creature of duty and obedience towards man also; one intermixing lovingly and friendly with the other, and neither performed as if it were to be regarded as a peculiar merit of the Christian. The common bond of all Christians is faith and hope by which they become partakers of the dispensation placed with them in their faith, or the meritorious death and the resurrection of Christ. Accordingly, the partakers of this common faith and hope form collectively that spiritual body of which Christ is the head, namely, the Christian Church, in which, as in the natural body, various members are distributed to the different members; but the most excellent endowment of any member is to walk in Christian love and purity under the guidance of the Holy Spirit. The two sacraments, which were typified to the Israelites in the wilderness, the Lord's Supper, are symbols of the Church's union with Christ. In baptism, the outward sign of our resurrection to a new life from the death of sin, and of our admission to the Church, we are joined by the Holy Spirit to Christ our Head; and the perpetual commemoration of Christ's death, according to his command in the Lord's Supper, is a means whereby we perpetually renew our spiritual strength, and draw more closely our union with him and with each other. (Laud., Hist. Paul.)

The conclusion of the subject-matter of the New Testament is a sketch (by prophetic anticipation) of Christian society in its completeness of glory, which shall be accomplished by Christ at his second coming as the glorified One. Thej shall triumph over all opposition, and the redeemed be united with God in everlasting happiness. We have seen that Christ's obsequies unto death was in order that many might live; and this will be accomplished at that resurrection when the meat things alone teach clearly. Those who are now in the image of the earthly, will then be in that of the heavenly. The same spirit, which we learn from the New Testament dwelteth in our mortal bodies, shall quicken these that they shall be raised from the dead and unto life everlasting. 'When those things shall awake,' then our mortal bodies will be changed, and made like unto the glorified one of Christ, by the power wherewith he is able to subdue all things unto himself.

TESTAMENT, OLD AND NEW. The view of the connection of the Old and New Testaments and the general theory of divine revelation given in the preceding article are by no means admitted by all Christians. They are departed from in various directions and degrees by different sects and parties, most commonly opposed by Unitarians. They deny that the doctrine of hereditary and total depravity is either consistent with reason and experience or at all sanctioned by Scripture. They hold the natural unregenerate, both in patriarchal times, and under the law, to be altogether misunderstood by those who consider them as referring to a corrupted nature and to an alienation. They endeavour to prove that the sacrificial language of the New Testament is founded on figurative allusions to the rites and ceremonies under the law, may be naturally traced to the circumstances of the writers, and has peculiarities which it could not have had if it had been intended to express a great religious doctrine. They maintain that the whole system of types and antitypes in the Old and New Testament is without good Scriptural authority, and loaded with inconsistencies and false views both of the law and the gospel. They also reject the applications which are made of some real or supposed prophecies.

The view which prevails among modern Unitarians of the general theory of revelation and the connection of the various parts is, that the different divine interferences were introduced in different stages in the progress of mankind from infancy towards maturity; that each was best fitted for the time in which it was given, uniting the greatest amount of immediate good with the greatest power to promote the advancement of the race; that the Jewish system was intended to preserve the general doctrine of the Unity of God at a time when the world in general was sinking fast into a degrading and corrupting idolatry, to exhibit to the nations around, and to all who should be able to contemplate the history of the chosen people, a proof and illustration by example of the moral government of God, and to prepare the way for the establishment, when the world should be in a fit state for receiving it, of the more perfect dispensation of Christianity, which may be properly represented as a spiritual system advanced to a higher stage of development. Thus religious truths could not have been previously delivered with advantage, especially the grand doctrine of a life, and opening the privileges of religious knowledge and faith, and hope to men of all nations without distinction of rank, and races. The knowledge of the paternal character of God and of his readiness to save all his children who sincerely desire and endeavor to see him; the doctrine of a future life distinctly taught and directly proved, and the enforcement of the powers of truth and grace, and the revelation of the attributes and state the opposite doctrines which form the grand object of controversy in the Christian world. Any attempt to give an account of the evidence appealed to on each side would lead us far beyond the bounds which we are about to prescribe to ourselves.

TESTAMENTS OF THE TWELVE PATRIARCHS: a Greek work which professes to contain the last works of the twelve patriarchs, the sons of Jacob, but which is analogous to the Twelve Patriarchs of the Old Testament. It was published by Whiston, who accepts it as a part of the canon of the New Testament; but no weight can be attached to his argument on the matter.

The age and authorship of this work are much disputed. It appears to have been written by Origen, who flourished about A.D. 230. The most probable opinion is that of Cave and Lightner, who suppose it to have been written by a Hebrew convert to Christianity about the end of the second century after Christ. The book is a work in which Christianity alone appears.

It appears to have been the writer's object to lead the reader to work into the Canon, since, though he makes frequent quotations from the books of the Old Testament, he never mentions any of them by name. The only book which he quotes from the New Testament is the Book of Esther (the Jewish account of the book of Esther). These testaments have been frequently published in Latin. They were first printed in Greek by Graeco and Spiegler, Patris, and afterwards by Fabricius in his Lexicon Patristicum, and Whiston published an English translation of them in his Authentic Records (Lardner's Credibility, part ii., c. 29, § 3, and the authorities there quoted.)

TESTIMONY, [EVIDENCE.]""
defined to be a more or less violent and rigid spasm of many or all of the muscles of voluntary motion; the name is also particularly applied (as will be seen hereafter) to one of the symptoms of tetanus. It also is given to all cases of violent muscular action, and also its name is as old as the time of Hippocrates; and, as it is proved by experience to be much more frequent in warm climates, the ancient physicians probably had peculiar advantages in observing it, and accordingly seem to have paid particular attention to the symptoms. Dr. Reynolds has given the following description of the spasms of tetanus, as described by Aretaeus:—

"Tetanic spasms, says this author, 'are attended with severe pain, and prove rapidly fatal; and by no means readily admit of relief; they make their attack on the muscles and tendons of the jaws and neck, but impart the disease to every other part; and are, in their action, the sympathetically affected with those which were primarily assaulted."

There are three forms of the convulsions: the straight, the backward, and the forward. The straight one is true tetanus, when the patient is stretched straight and inflexible, and the backward or forward varieties have their name from the direction and locality of the tension; hence the deflexion of the patient backwards is termed opisthotonos (opisthōthōnos), from the nerves being affected in this direction. So if the patient is prostrated, as is often the case, it termed emprosthotonos (emprosthōthōnos), for tonos (tōnos) is a term which signifies both a nerve and tension."

The causes of these affections are numerous: they often follow a wound of a membranous part, or punctures in muscles, or septic life, or to the injury of tendons; for (as Hippocrates says, ἀφθορία, sect. v., § 2, tom. iii., p. 735) "traumatic spasms are fatal." A woman may be convulsed after miscarriage, and she seldom recovers; some persons are seized with spasms from a violent blow on the neck, intense cold may prove a source, and hence these diseases are particularly liable to occur in the winter; they are less frequent in the spring and autumn, and least of all in the summer, unless they arise from a wound, or a visitation of foreign diseases. Women are more liable to convulsions than men, because they are of a colder temperamment, but they more frequently recover, from the moisture of their tempersments.

As respects the various periods of life, children are liable to this affection, but do not often die, for it is one they are used to, and familiar with; youths are less frequently affected, but more die; adults are least of all liable to be attacked; while the old have it, and die from it, more than others. If of little or no disease in the patient, the cause is referrible to the frigidity and dryness of old age, which is also the stature of death, for, if the cold be attended with moisture, the spasms are less injurious and fraught with less danger;"

"It may be said in general of all these affections, that they are attended with pain and tension, both of the tendons and spine, and of the maxillary and thoracic muscles; for they so clench the lower jaw to the upper, that it is not easy to separate them either by lever or wedge; and if, on forcibly separating the teeth, any liquid be introduced, it is not swallowed, but retained, or returned in the mouth, or ejected through the nostrils, for the passage of the fauces is closed, and the tonsils, being hard and tense, do not bend; so that we have on the face a stranger expression; the face is red and mortified, the eyes nearly fixed, turned with difficulty round, there is a strong feeling of stifling, respiration laboured, the arms and legs on the stretch, the muscles quivering, the face distorted in all sorts, the cheeks rise, the cheeks and lips tremulous, the chin in constant motion, the teeth grate, and sometimes the ears will move, as I have myself witnessed with amazement: the urine is either retained with violent pain, or flows off involuntarily from compression; the symptoms which, in this case, are the most distressing are the species of spasms; each variety of this disease has however its peculiarities."

"In tetanus the whole body is stretched in a right line, rigid and immovable, while the legs and arms are usually in convulsion; in opisthotonos the patient is bent back, so that the head pulled in that direction lies between the shoulder-blades, while the throat projects; the lower jaw is usually open, and is not located with the upper; the teeth are eburneous, the abdomen and thorax are prominent, and in this form especially there is incontinence of urine; the epigastrum is tense and resonant when struck, the arms are forcibly wrench'd back in a state of tension, while the legs lie bent together, for the elbow bends in a manner the reverse of what the hand does."

"If emprosthotonos take place, the back is bent, the hips are forced on a level with the shoulders, the whole spine is on the stretch, the head is dependent and bent on the sternum, the chin fits the breast, the spine is stretched from head to foot, and the legs at full stretch. The pain is severe in all the forms, and wailing is the voice, deep are the sobs and groans, and if now the disorder has assailed the chest and diaphragm, it soon hurries the sufferer off—a doom indeed to him, as it removes him from all sources of humiliation, and serving also to lighten the distress of those present, even if they be his own father or son; but if there be still respiration enough to support life, and although oppression is not performed, the patients are not merely bowed forward, but are even rolled up like a ball, so as to have their head on their knees, and their legs and back parts wrench'd forward. so as to look as if the knee joint were thrust into the ham. It is an afflication more than man can bear; a sight revolting and painful to behold; and this cruel disease is irremediable, and from the distortion the sufferer is not recognised, even by his dearest friends, and the prayer of those around (which are often heard)—for which is it now righteous, that the wretched sufferer may depart out of life, and be released at the same time from his existence, pain, and horrible torment; and the physician, though present and looking on, is not merely unable to do any thing to relieve his patient, but cannot even improve his shape; for to attempt to straighten the limbs would be like mangling and breaking the man in pieces while yet alive, and therefore, no longer offering his assistance, he is reduced to the sad necessity of merely contributing his sympathy."

The three forms of the disease mentioned by Aretaeus are described by most of the antient writers: the species called irtrimus, or locked-jaw (which is the name applied to it when the spasms are confined to the jaw or throat), forms a fourth in modern authors; and to these has been added a fifth, under the name Pleurothotonos (pleurothōthōnos), which signifies that the body is drawn to one side. These different terms applied to tetanic affections do not imply so many particular diseases, but only the seat and various degrees of one and the same complaint. Trimus is invariably a part of each of the other varieties. This subdivision of the disease is important; and the essential division is into acute or chronic, according to its greater or lesser intensity. The former kind is exceedingly dangerous and usually fatal; while the latter, on account of the more gradual progress of the symptoms, affords a more opportunity to measures of success."

In Mémo. de Chirurgie Militaire, tome i., pp. 235, 236, quoted in Cooper's Dict. of Pract. Surgery, Tetanus is also divided into traumatic, or that arising from a wound, which is also occasionally termed symptomatic; and into idiopathic, or that which proceeds from other causes.

Traumatic tetanus sometimes comes on in a surprisingly sudden manner, and quickly attains its most violent degree. The most rapidly fatal case that has ever been recorded is one which occurred in the late Mr. Sneddon, of Edinburgh. It occurred in a negro, who scratched his thumb with a broken china plate, and died of tetanus a quarter of an hour after this slight injury. (Rees's Cyclo-·pœdia, art. "Tetanus," quoted by Cooper.) Commonly however the approaches of the disorder are more gradual, and it slowly advances to its worst stage. In this sort of case the commencement of the disorder is announced by a sensation of stiffness about the neck, a state of anxiety, and a tremor of the head difficult and painful. In proportion as the rigidity of the neck becomes greater, the patient experiences in the throat a sense of dryness and soreness, and about the root of the tongue an unpleasantness, soon changing into a difficulty of mastication and swallowing, which after a time become totally impossible. The attempt at deglutition is attended with convulsive efforts, especially when an endeavour is made to swallow liquids; and so the distress which accompanies these convulsions, that the patient becomes very reluctant to renew the trials, Vol. XXIV.—2 K
and occasionally refuses all nourishment: sometimes it even inspires him with a dread of the sight of water, and a great resemblance to hydrophobia is produced.

With respect to the causes of tetanus, it must ever be recog- nized that Dr. Gregory (Theophrastus & Practice of Med.) made a very singular fact in pathology, that an affection of so peculiar a character as this should have its source in causes apparently so dissimilar; that the puncture of a nerve, the laceration of a tendon, or an extensive burn, should bring on an idiopathic nervous affection that which is the occasional consequence of cold.

Every description of wound, no matter how inflicted, or in what part, or in what stage, may be the occasion of tetanic symptoms which form a specific symptomatized tetanus. Cases are on record (cited by Dr. Symonds in the Cyclopedia of Practical Medicine, vol. iv., p. 479, quoted in Cooper Surg. Dict.) in which the patient was attacked with the disease in consequence of a bite on the finger from a tame sparrow; in which it supervened on the mere stroke of a whip-lash under the eyes, though the skin was not broken; in which it was occasioned by a small fish-bone sticking in the pharynx; by a slight solution of continuity in the external ear from a musket-shot; by the application of a lens to the thorax; by the bite of a case of the back of the neck; by a blow on the hand from the same instrument; by the extraction of a tooth, &c. In short, according to Sir James McGrigor (quoted by Dr. Symonds), it occurs in every description and variety of wound, from the most formidable, from the healthy and the sloughing, from the incised and the lacerated, from the most simple and the most complicated.

Next in frequency to wounds as an exciting cause of tetanus is exposure to cold and damp; indeed there are but very few cases of true idiopathic tetanus which are referrible to any other. The irritation of worms and other obtrusive states of the alimentary canal have been considered by some authors as the cause of tetanic affection. To generate this form of disease however, it would appear that a certain predisposition is also requisite, and it is double the same with that which operates as an accessory cause of the traumatic tetanus. The predisposition to tetanic affections is given, in the first place, by warm climates and warm seasons. Within the tropics therefore it prevails to an extent unheard of in colder latitudes.

Secondly, tetanus is chiefly observed to prevail when the atmosphere is much loaded with moisture, and particularly when this has suddenly succeeded to a long course of sultry weather. Even in this country exposure to the cold and damp air of the night has occasionally been followed by an attack of tetanus. In tropical climates climate dangerous subject to this peculiar affection, and very few peculiarities which, though producing no specific difference, have been thought sufficient to constitute a variety known by the name of trismus nasicetum. The disease in this case is vulgarly known by the absurd name of fulica. It is occasioned by a viper bite, and is most frequent in the latter part of the year. It is not uncommon after the fourth day after birth, and seldom occurs after the latter period. Without any febrile accession, and often without any perceptible cause whatever, the infant sinks into an unnatural weakness and drowsiness, attended with frequent yawning and with a slight difficulty of moving the lower jaw. This last symptom takes place in some instances sooner, in others later, and soon increases in intensity. Even while the infant is yet able to open its mouth, there is a gradual loss of the power of raising it or swallowing. By degrees the lower jaw becomes rigid, and totally resists the introduction of food. There is no painful sensation, but the skin assumes a yellow hue, the eyes appear dull, the spasm often extend over the body, and in two or three days the disease proves mortal.

The prognosis of this disease is many to be determined by the nature of the exciting cause, and by the type of the seizure. Tetanus of the idiopathic kind has certainly been occasioned in a more or less proportion of cases by a low external injury, which is a fact well-known (says an able writer in the Edinburgh Journal, vol. xxv., p. 292, quoted by Dr. Symonds) 'to every planter in the West Indies, who never considers his negroes as safe when the discharge of a weapon is heard on a wound.' It is very probable that this is the cause of the greater part of the cases in alleviating the idiopathic species.

The type of the disease as acute or chronic is a no less important guide as to the probable termination. It may be said that recovery in a case of acute tetanus is almost, if not altogether, hopeless: the chronic form however is of a much milder character. The usual termination of the disease may be stated to occur on the third or fourth day; and if the patient survives that time, there are good hopes of the recovery: it is rarely protracted beyond the seventh day. Mr. Cooper however mentions (Surg. Dict.) that he had a patient (who had been wounded, and suffered amputation of the thigh) who lingered five weeks with chronic tetanus before his death.

The discharge of patients who have died of tetanus has thrown little or no light upon the real nature of the complaint, as is indeed the case in almost all wounds or neuralgic disorders. Sometimes slight effusions are found in the nasal and pharyngeal parts. Cases are on record where any considerable effusion whatever can be detected within the brain. There is always more or less of an inflammatory appearance in the cranium and in the villous coat of the stomach about the cardia. These appearances however are common to a great number of diseases, and are conformably met with in every case of rapid or violent death. Besides the redness and increased vascularity of these parts, Baron Larrey found the pharynx and esophagus much loaded, with a vivid reddish mucous membrane. He also found numerous hemorrhage in the bowels of several of the patients who died; but this, as Mr. Cooper remarks, could only be an accidental complication, and not a cause. In several cases Dr. M'Arthur found the intestines and organs of digestion to the extent of a fish bone, a peculiar offensive smell, covered their interior surface, but whether the inflammation was primary, or only a consequence of the pressure of the abdominal muscles, was confirmed by no violent Chili in these cases, he is unable to decide.


The treatment of tetanus is confessedly a subject of infinite difficulty, as the disease frequently hovers on the edge of death for weeks, and is only well under the employment of the very same remedies which decidedly fail in other similar cases. Upon the whole it will probably be universally admitted that an effectual remedy for tetanus has yet to be discovered: every plan has occasionally succeeded, and every plan has still more occasionally failed. The following is the statement of the opinions of the antients on this point given by Mr. Adams in his Notes on Paulus Regineta.

Hippocrates (Aphor., v. 70), Galen (De Las. Med., lib. i., De Med. Nat., lib. v., On the Oesophagus, &c.) and Avicenna (ibid., cap. 6, Avicenna. ibid., cap. 6, &c.) agree in stating that a fever coming on tends to remove the tetanic affection. Celius Aurelianus (De Mort. Anim., lib. iv., vi., cap. 10, cited by A. D. S.), and otherwriters, affirm that an aphorism. Hippocrates disapproves of the cold in cases of traumatic tetanus: Alexander Aphrodisius however speaks rather favourably of it (Problem. Pp. i., 53). Aetius (lib. viii., c. 36), Oribasius (Skelet. i., c. 3) and Nicolaus (ibid., c. 117) remark beneficial effects of the bath (Res. Med. Be., lib. iii., c. 20). According to Aetius (ibid., c. 21) it is recommended for this purpose. The treatment is recommended by Celsius (De Medici, ii., c. 1) is judicious, and not unlike that of Paulus Regineta. He expresses himself hesitatingly about this, and forbids the early use of wine; he approves of open air, and is strongly recommended by Dr. Hamilton of Edinburgh.

The treatment of Aretaeus (De Car. Med., iii., c. 6) is altogether soothing and relaxing. He recommends to lay the patient upon a soft warm bed, and from whatever cause he may be seized, to begin with abrading blood from the arm. The soft liquid food is to be given, and the whole body wrapped in wool moistened with some calomel or tincture of opium. He is of opinion that the soft oil is the cause of the nausea. He is confirmed by the experience of the late M. Larrey. He recommends a similar mode of practice, that when ambulatory supervenes, the dose becomes dry. He pronounces and as antidotes to antispasmodic acids, and, if these com-
TET

TET

be swallowed, they are to be given in an injection. He advises cold for an injection.

Calvisius Aurelianus (loc. cit.) enumerates nearly the same causes as Aretaeus, and describes all the symptoms of the disease with the greatest precision. His treatment is also nearly the same as that of Aretaeus, namely, emollient applications to the neck, and castor oil.

He even enjoins the bath of oil, which has fallen into disuse in modern practice, most probably solely on account of the expense with which it would be attended. He also permits sometimes to use the common bath, but so cool as to be cold to the touch. He condemns Hippocrates for giving both wine and emetics, and having recourse to venaecision, without due discrimination. He blames him also for recommending the affusion, as a part of our remedies, to improve the saliva in the mouth, which it imparts to the system proves beneficial by rousing the vital heat and energies of the patient. Hippocrates however, as stated above, forbade the cold affusion in traumatic teta- na. Paulus Egineta's opinion of this practice is just such as the modern emollient writers have received another trial upon the recommendation of the late Dr. Currie. (See Medical Reports, and Larrey's Mémoires de Chirurgie, t. 1.)

Octavios (loc. cit.) recommends bleeding, emollient applications, purgative oysters, the tepid bath, antispasmodics, and soporifics. The use of the last-mentioned class of remedies does not appear to have been sufficiently understood by the antiquites; at all events they were less partial to them in this than in the moderns.

The Athenians enjoy nearly the same treatment as the Greeks. Avicenna (loc. cit.) and Mesue join the preceding authorities in recommending strongly the use of castor and saffon for antispasmodics; and yet it is possible that some refinements might have been valuable in these medicines. (See Sir James M'Grigor's com- munication in the Medico-Chirurg. Transact., vol. vi.) Avicenna, like all the other, praises the bath of oil. Se- rapius (lib. i., c. 27) speaks of a bath prepared with emolli- ent herbes. Haly Abbas (Theor., lib. i., cap. 10, 11; Proct., lib. v., c. 31) describes minutely the two varieties as occasioned by repletion or irritation. For the former, he approves of purging with hot drastic purgatives, of rubbing the body with warm oil, and of the use of warm bath with friction after it; he also approves of castor.

For the other variety he praises the affusion of plain water in which letuces, barley, &c. have been boiled. He recom- mends the internal use of pot asses fat, and of castor oil, and rubbing the body with oil of violets. The treatment recommended by Alsharavius (Pract., lib. i., § 2, c. 21) is very similar. Rhasae mentions (Divit., lib. i., c. 16; Contin., lib. i. 1) Hippocrates' proposal of the cold oil; but Paulus Egineta, he rather disapproves of it. He himself recommends bleeding, when there are symptoms of repletion, emollient applications to the neck, the bath of oil, the application of leeches to the part affected, purging with aloe, &c., and the administra- tion of antispasmodics, such as castor, saffon, and the like.

The general principle of cure, as Dr. Good remarks, is far more easily explained than acted upon: it is that of taking off the local irritation. The parts are to be denuded of the nervous erethism of the entire system. The former of these two objects is of great importance in the locked-jaw, or trismus, of infants; for, by removing the viscid and scirrhouous meconium, or whatever other infantile excritions are lodged in the neck, venaecision, and other times effect a speedy cure without any other medicine. Castor oil is by far the best aperient on this occasion, and it may be given both by the mouth and by injections. If this however do not succeed, we should have recourse to opium, which is the best opiate, which should be administered in doses of from three to five drops of the tincture according to the age of the patient. Opium has also been more extensively resorted to in the cases of adults than almost any other remedy; and Dr. Good, Dr. and others profess that it is on which they place their chief, if not their only reliance. To give it a

fair chance of success, we must begin its use from the first appearance of the teta- nic symptoms. It must be given in very large doses, and they should be repeated at such short intervals as to keep the system constantly under the influence of the remedy. It is astonishing to observe how the human body, when labouring under a teta- nic disease, will resist the operation of this and other remedies, which, in its healthy state, would have been more than sufficient to overpower and destroy it. It is advisable to begin with fifty drops of laudanum, and to repeat this at intervals of two or three hours, or even longer; for if the venom is to be neutralized, some effect has been produced on the spasms. In the early stage of the disease we are to bear in mind the ap- proaching closure of the jaws and difficulty of deglutition; and, to avoid any serious accidents, we must provide for serious obstacles to their administration. The patients have occurred, and are found to be insuperable, opiate enemas and frictions may be tried; but we must not an- ticipate much benefit from such feeble means. Such are Dr. Gregory's remarks; but Dr. Symonds considers that the employment of opium is recommended chiefly by sys- tematic writers, and for theoretical, rather than for practical reasons; while most of those who give the results of their own experience express the greatest dissatisfaction with the remedy.

Probably a much more efficient class of remedies than the preceding is that of purgatives; both on account of the obstinate constiveness which attends the disease, and also because we have in daily practice such convincing proofs of their strong revulsive influence on diseases of the cerebro-spinal centre. The testimony of the army phy- sicians, as we learn from the report of Sir James M'Grigor, is highly in favour of a rigid perseverance in the use of purgatives, given in proper doses, as a prelude and auxiliary of the general treatment. Dr. Forbes states that a solution of sulphate of magnesia in infusion of senna was found to answer better than any other purgative; and it was daily given in a suf- ficient quantity to produce a copious evacuation, which was always dark-coloured and highly offensive; and to this practice he chiefly attributes in one severe case the removal of the disease. (Med. Chir. Trans., vol. vi., p. 452, quoted by Mr. Cooper.) Dr. Good condemns drastic purgatives, forgetting apparently that mild ones have no effect. Strong cathartics have indeed frequently proved of great service, and none has higher repute than croton oil.

The employment of the warm bath has been recom- mended by numerous writers, but it would be difficult to trace in their accounts any facts which decidedly show that its adoption was ever followed by unequivocal benefit. Cold bathing has also been advised, but it has generally been found to be of more value as a measure of cooling and refreshing, than as a means of producing an expectoration. Warm baths certainly have in several cases proved expedient in cases of almost instant death having followed its employment.

The practice of bleeding is another that has been tried, but most frequently without effect. In some few cases the ampullation of the limb, from the injury of which the teta- nus has arisen, has been successful; but as this extreme measure is also very uncertain, it is not likely to be ever extensively adopted.

Numerous other remedies have been tried, with no or very imperfect, success; for instance, acupuncture, strychnia, mercury, caustics, blisters, tobacco, oil of tur- pentine, aether, camphor, musk, bark, wine, sepi-a-oxide of iron, &c. &c. However, it must, after all these have been tried, be allowed that tetanus is a disease of such formidable and unmanageable disorders, and that recovery in the acute form still continues to be almost hopeless.

(Cooper's Surgical Dict.; Symonds in the Cyclop. of Pract. Med.; Good's Study of Med.; Gregory's Theory and Practice of Med.; from which works most of the pre- ceding remarks have been taken. A reference to nu- merous other works on the same subject will be found in Dr. Gregory's Letter in the Edinburgh Review, and Forbes's Medical Bibliography, in the Cyclop. of Pract. Med.)

TETBURY, an ancient market-town in Gloucestershire, near the borders of Wiltshire, situated on elevated ground near the source of the Warwickshire Avon, 99 miles west by north from London, and 20 miles south-east of Gloucester. The parish, with four hamlets, contains a population of
The second order, Dibranchiata, has the following synonyms: Cryptodontibranchia, Blainv.; Acetabulifera, Brug.; Tetrabranchea, De Blainv.

The Tetrabranchiata are divided into two families:

Of the Dibranchiata, Professor Owen remarks, that though there is no unification of this tribe in the ancient world, as the shells called Belemnites, or thunder-stones, the fossil shells of the Sepia discovered by Cuvier, and the horned rings of the acetabula found by Buckland in the coprolites, or fossil faeces, of Ichthyosaurus, were, in his opinion, a very early development of the cephalopods, chiefly founded on observation of existing species. Thus, says the Professor, "are extremely numerous: they frequent the seas of every climate, from the ice-bound shores of Boothia Felix to the open main, and from the fungus or Gulf-weed of the Equator; they seem however to be most abundant in temperate latitudes. Many species frequent the coasts, creeping among the rocks and stones at the bottom; others are pelagic, swimming well, and are generally larger than those which live on the bottom of the sea."

Professor Owen then adverts to the great variety of genera presented by the Dibranchiata, remarking that although the bulk of the gigantic species has been undoubtedly exaggerated, yet the organization of this order is irreversible. Many of the shells are presented by the individuals of any other group of invertebrates. Some of them he adds, the Unointed ammonites, caught by Banks and Solander in the southern seas (Decapoda, D'Orb., xii., p. 253), together with the cephalopods weighing one hundred pounds obtained by the French naturalists in the Atlantic ocean under the line, and preserved in the Museum of the Garden of Plants at Paris.

The Dibranchiate Cephalopods are divided by Professor Owen into two tribes, the Decapoda and the Octopoda.

The Decapoda, besides the possession of ten arms, are characterised by having a pair of fins attached to the mantle; by having the funnel either adherent at the anterior part of its base, and with an internal valve, or articulated at the same part by two bilabiate sockets joined to the mantle, and provided with a valve externally at its apex; by having fleshly appendages to the internal valves and gills; glandular processes to the lateral ducts; by having generally a single oviduct with detached super-added glands; and lastly, by the shell or radula being single, mesial, and dorsal.

Professor Owen considers the Decapoda tribe to be that which is most nearly allied to the Tetrabranchiata; and he regards Spirula as the type of the whole family of the Decapodous tribe, or that which immediately succeeds the Tetrabranchiata.

The following are the families of the Decapoda:
2. Belemnitidae: genera, Belemnites, Lam.; Actinoceras, Miller; Pseudobelus, Blainv.
4. Teuthidae (Calamaries); thus divided:
   A. Funnel without an internal valve, and articulated at its base to two ventro-lateral cartilaginous prominences of the mantle.

Genera: — Sepioteuthis, Blainv.; Loligo, Cuv.; Octopus, Lam.; Octonotus, Owen; Sepiola, Leach.
   B. Funnel unprovided with an internal valve, and adherent at the antero-lateral parts of its base to the mantle.

Genera: — Sepia, Lam.; Cranchi, Leach.

Of the tribe Octopoda the Professor observes, that besides wanting the long tentacles, they are also characterised by the want of mantle-fins, and consequently limited to retrograde progression while swimming; the cephalic suckers, are secondarily united into a viscid head gland in some species; the two oviducts, but without detached glands for secreting the nidamentum: the Decapods have a single oviduct and detached glands for secreting the nidamentum.

The Octopoda are thus arranged by Professor Owen:
1st Family. Tactoidea: genus Argyrodes, Lam.
2nd Family. Nuda: genus Octopus, Leach;
The Greek what the octave is to us, the unit, as it were, of the scale, in the subdivision of which consisted the differences of their systems. We now give a tetradchord from each of these twenty-three scales, assigning the intervals first by the ratios of the vibrations, next by the number of mean semitones they contain, as in the article Scale. We prefix the Latin rendering of Ptolemy’s appellatives from Wallis.

And first as to enharmonic scales, which are mentioned first, and seem to have been antient, and regarded with high approbation.

<table>
<thead>
<tr>
<th>Ratio of Numbers of Vibrations in each Interval</th>
<th>Mean Semitones in each Interval.</th>
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<tbody>
<tr>
<td>CP</td>
<td>PQ</td>
</tr>
<tr>
<td>Archytas</td>
<td>5: 4</td>
</tr>
<tr>
<td>Aristoxenus</td>
<td>19: 15</td>
</tr>
<tr>
<td>Eratothenes</td>
<td>5: 5</td>
</tr>
<tr>
<td>Ptolemy</td>
<td>5: 4</td>
</tr>
</tbody>
</table>

It seems then that the enharmonic system would allow only of the following notes in an octave—

CEPFGBCQ; where P means a note about half way between E and F, and Q one half way between B and C. An odd scale truly for a modern musician to look at, but, it may be, not incapable of pleasing effects to ears not accustomed to music in parts.

The chromatic scales come next in order, as follows:

<table>
<thead>
<tr>
<th>Ratio of numbers of Vibrations in each Interval</th>
<th>Mean Semitones in each Interval.</th>
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</thead>
<tbody>
<tr>
<td>CP</td>
<td>PQ</td>
</tr>
<tr>
<td>Aristoxenus</td>
<td>56: 45</td>
</tr>
<tr>
<td>Do., Sesquialterus</td>
<td>37: 30</td>
</tr>
<tr>
<td>Do., tonici Chromatica</td>
<td>6: 5</td>
</tr>
</tbody>
</table>

To make something as like as we can to these scales, we should write down in modern music

C E F G B B C.

The diatonic scales, Ptolemy allows, are more agreeable to the ear, and his specimens are as follows: we shall now write the scale with the usual letters throughout.

<table>
<thead>
<tr>
<th>Ratio of numbers of Vibrations in each Interval</th>
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</thead>
<tbody>
<tr>
<td>CP</td>
<td>DE</td>
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These scales have all so far the diatonic character that they divide the tetradchord into two larger intervals followed by a smaller one: the scale of Didymus would have exactly the modern untempered diatonic scale, if he had inverted the order of the two larger intervals in his second

C • 1-65 E F G B B C.

This is also Ptolemy’s Diatonica.
tetrahydro. As to the other modes, the Dorians, &c., there is much confusion in Ptolemy respecting them, arising from the corruptness of the text, which Wallis has endeavoured to remedy. According to him, they are divisions of the octave, somewhat more fantastic than those which precede. In more recent times the idea has been started of their being simply different keys, or rather answering to different variations of the diatonic scale, by using intermediate semitones instead of some of the notes: it would be difficult to think, to produce authority enough for this conjecture.

If it were true, as supposed, that the two octaves of the Greek scale, beginning, say with A, were minor, it would follow that Ptolemy, in his diatonic scales, exhibited the other, or fourth, key, as we have it, the principal mode of exhibiting the formation of the octave from two tetrachords and a tone would be the one we have taken, namely,

(C D E F) (G A B C)

But it is frequently supposed that it was the following:

(C D E F (G) A B C) or the following—

(A B C D E) F G A.

On this point we shall only say that there never was, we believe, so strong a union of the three characters of scholar, mathematician, and musician, as was seen in Dr. Smith and Dr. Burney. He had studied the Greek scale attentively, and to him the first of these methods was a matter of course. The Greek musicians (Harmonics, 1749, p. 45), after dividing an octave into these six parts, discovered the diatonic scale, and admitted many primes to the composition of musical ratios, subdivided the fourth into three intervals of various magnitudes placed in various orders, by which they distinguished their kinds of tetrachords.

We do not confess, though admitting that it is exceedingly hard, and probably impossible, to reconcile the Greek writers with themselves and each other, find that sort of difficulty which Dr. Burney owned to, when he said that he neither understood those writers himself, nor had met with any one who did. He was a musician, and was looking out for an intelligible mode of arriving at and distributing the most agreeable concords, with a strong determination to arrive at musical truth or nothing. But the Greek writers were mathematicians, with as strong a determination to find natural foundations in integer numbers: they did not ask how to find sounds which would best suit the ear, but how to discover triplets of fractions which multiplied together should produce four-thirds of a unit. Pleased with the simplicity of the scale which gave him the fourth, fifth, and octave, their efforts at musical improvement were confined to the attempt at discovering magic numbers to fill up the intervals. It was not until one of these philosophers had laboured at his abacus, and tasking his metaphysics to find a priori confirmation of some question in arithmetic, that he strung his monochord and tried how his scale sounded: it would have been hard indeed if his ear had refused to sympathize with his brain. In all probability the musicians, whose object was simply to please, laughed at the mathematicians, as Tycho Brahe did at Kepler, when the latter had discovered reason for the distances of the planets in the properties of solid bodies: they had motive enough, and, beyond all question, justification.

TETRACHORD (τετραχορδον, 'four-stringed'), in the music of the Greeks, was a system of four sounds,—as, for example, the diatonic tetrachord, C, D, E, F; the chromatic, C, D, E, F; the enharmonic, C, D, E, F. The last two are derived from the first by the octave of two conjoint tetrachords; and so far as the diatonic scale is concerned, they and the moderns agree. In what relates to the other two scales, so little is accurately known, and the subject is not more important, to the musical reader, that we should not further enter on it, even if the space allotted to our department allowed of extension. [Genera; Music, History of.]

TETRADYNAMOUS (from τετρα, 'four,' and δύναμις, 'power') is an empirical term employed to denote the character of those flowers which, possessing six stamens, have two of them shorter than the other four. This peculiarity is found exclusively in the plants belonging to the natural order Cruciferae. Hence the Linnaean class Tridynamia, including only plants with the stamens arranged in this manner, is an exceedingly natural one, and is one of the few instances in which a peculiarity in the flower (Leaves through which the stamens pass) is a term which expresses the existence of four stamens, two of which are short and two long. This character is one of the great number of natural families, as Labiate, Scrophulariaceae, Bignoniaceae, &c., and is always present throughout, familiarly where it is found.

Didynamia is founded on this peculiarity of the flowers.

TETRAGONON (properly a four-angled figure, but usually applied to the square only, when used, which seldom is) is one of Linnæus's artificial orders of plants, placed by Lindley in his Curvembryaceae group of incomplete dicotyledons. It includes the genera Tetracoma, Azolla, Saururus, and Miltus, which are generally placed among the Cicadellae or Membracids. The reason for this will be given by Dr. Lindley for this separation is the want of pairs in these genera, as he considers that the tendency to produce petals in the Membracids is of too powerful a nature to admit exception. The relation of these apetalous families to the nematocerous insects is so strong, that Dr. Linnæus states there is no character to distinguish them, except very being formed of several carpels.

Like Cicadellae, this order possesses thick membranous leaves, which in many of the species might be used as a substitute for paper, so thin are they. It is native to New Zealand and Japan, and is used by the natives of those countries as a remedy in those forms of cutaneous disease called scab arrangements. It might be used in our cold climates in the wintertime, for it is evergreen. A. hispanicum grow on the sea-coasts of the Canaries and Spain, and are amongst the plants which yield sawdust after burning.

TETRAGONOLOBIUS (from τετραγώνος, 'four-sided,' and λοβοεδός, 'with lobes,' a genus of plants belonging to the hardy flowered division of the natural order Leguminosae. It contains herbs with broad leaf-stipules, trifoliate leaves, petioles, alternate leaflets and flowers placed on axillary peduncles, furnished with a bract. The calyx is foliaceous, and the flowers are yellow and the legume is cylindrical, furnished with four fleshy wings which give it a long-tailed appearance.

T. purpureus (purple winged-peg) is a pilose plant with decumbent stems, entire obovate leaflets, bracts larger than the calyx, and a glabrous legume, with globose seeds. It is a native of the south of Europe, and has dark purple flowers: a variety is, however, found with flowers of a dark red.

There is also a variety called T. p. minor, in which the stem, leaves, and legumes are much smaller. In members, where this plant grows in perfection, the small legumes are cooked and eaten in the same manner as fresh beans.

There are four other species of Tetragonolobus and them inhabitants of Europe. In general appearance and them very much resemble the species of Bird-foot treas (Lotus), and in garden are well adapted for ornamental rock-work. They are best propagated by seeds.

TETRAHEDRON (a solid of four faces), a term usually applied to the regular tetrahedron. [Regular Polyhedron: TETRAHEDRON.]

TETRAO. [Tetraonidae.] TETRAONIDAE, Mr. G. R. Gray's name for a genus of birds, placed by Mr. G. R. Gray in the subfamily Lophodineia, of the family Phasianidae. Example, Tetrailus gallus. [Ill. Zoöl.]}

TETRANOIDEAE, Dr. Leach's name for the Genus family of Linnaeus. Linnaeus, in his last edition of the Systema Naturae, places the genus Tetro on the end of his fifth order, Columne, next to the genus Numida. The Galloinae he places in the same order, so that the genus Tetro is the last of the order Galloinae, and the genus Columne the first of the order Pinniceae.

The Linnean genus Tetro is very extensive, comprising not only the true Grouse, but also the Francolin, Pigeon, and several others. Linnaeus intended Tetro to include the

Cuvier, in his last edition of the Règne Animal, under the Tétres (Tetro, Linn.) under his fourth order, Gallinae (Gallininae, Linn.), placing them between the
The genus Tetrax, while Pterocles includes such as inhabit the arid sands of Africa and Southern Europe. The northern parts of our empire, he observes, still furnish us with several species; but he laments the extermination in Britain of the largest and most noble grouse of Europe (the Red Grouse). The loss of this species is now the result of the excess of the wood must be meant).

Mr. Swainson goes on to point out how sometimes the side feathers on the neck of the male grouse are developed in a singular manner, so as to resemble little wings—a character mostly confined to the American species (Te.

The African and Indian Grouse (Pterocles) have, he remarks, frequently very pointed tails, and the hind-toe is very short:—loot with the toes closing external, as to the true grouse. But he notices one species, Pt. setarius, Temm., which extends its range to the South of France. He then proceeds to point out that nearly all the Grouse have the toes and legs more or less covered with soft feathers; but that this character disappears in the Pterocles—a extensive group scattered over nearly all parts of the Old World, but unknown in the New, where they are represented by the genus Odontophorus, Vieill.

The Quails, he observes, that the white parts of the head and neck, with a few filaments, and those on the rump; others, the Turdus of Spix, have no tail at all, and their nostrils are placed a little farther backward; and he adds that one should distinguish Rhynchotus of Spix, which has the bill stronger, without any furrow, slightly arched and depressed, with the nostril pierced towards its base.

Mr. Vigors places the Tetraonidae among the R丨sorales, observing that the groups which form the family are chiefly distinguished in modern systems from those of the Phasianidae. In a few instances, the absence in fact of those ornaments to the plumage, and those naked or carunculated appendages to the cheeks and head, so conspicuous in the latter family, but which are missing in these and the hens in the sub-family, the family under consideration has an intermediate station between the Phasianidae, where the hind-toe, although elevated high on the tarsus, is yet comparatively strong, and the Struthionidae, where it is generally, if not always, reduced to the mere spike that encircles the eye. The still weaker conformation of the hind toe lends, Mr. Vigors observes, further to separate them; for his member in the Tetraonidae becomes shorter and gradually weaker, until it is completely lost in some of the people.

In America, the genera Turdus, Turdus, and the true Turdus, where it has, he observes, been generally arranged, and from which it has been chiefly separated by the defacement of a nail to the hind toe. From Perdix, Mr. Vigors proceeds to Pterocles, Temm., which, by its half-plumaged hind-toe, is intermediate between that genus and the true Teuro. By means of Lagopus, Cuv., in which the legs are feathered, Mr. Vigors arrives at the single Grouse, which have the hind-toe immediately connected with Ortygias of the same author by the absence of the hind toe. With these groups, in his opinion, the genus Turdus, Lath., corresponds by the eight toes, three of which are very short, and those of the tenth toe, which is feeble and the nail scarcely developed. This group leads him back again to Cryptorhynchos, which has no nail to the joint of the hind-toe. The whole of these mentioned groups, thus united, correspond also, Mr. Vigors observes, in the shortness or weakness of their tails.

Those of the Tetraonidae which exhibit a weakness or deficiency in the hind-toe, lead Mr. Vigors to the three sub-genera of the Struthionidae, with the bills of which, more particularly that of Rhiss, some of those species of Tinamous, Temm., of which he has the orders. (Natural System and Families of Birds, Linn. Trans., vol. iv.)

Mr. Swainson makes the Tetraonidae form the third main of R丨sorales and states that it is composed of the Partridges, Grouse, and Quails; all of which agree in the extreme shortness of their tails and of their hind-toe: their legs are also, he observes, remarkable for a total want of brilliancy of plumage which so eminently characterizes the other groups. In America, as he observes, there is a remarkable species of Pterocles, in which the toes are short, and the soft feathers which lines them are nearly white.

The Prince of Camino, in his Birds of Europe and North America, makes the Gallinina the third order of his second sub-class, Gallinae; and this order comprises the families Pteroclitidae, Phasianidae, Tetraonidae, and Cryptorhynchidae. The order next in succession to the Gallina is formed by the Gruiles.

The Pteroclitidae include the following subfamilies and genera:—

1. Syrhrhipinae.
2. Certhinae.
3. Pteroclitinae.
4. Tetraoninae.

See the article SYRHRHYPUS. The attempt at reductionism has made for the species of success by the slightly larger or shorter of the two sides of the head, the most of the American species. In Sweden forty-four of these magnificent Grouse: they were all thought to be objectionable birds and almost all killed. In England, where the mode of killing is perfect, a group exhibited in the British Museum, and retained another portion in a large aviary. Both export and domestic, and it was noticed that they were bred in the season of 1829. Forty-nine were hatched at the aviary by Henry Huxley (females of Black Grouse).

In 1829 they were sent for the Gala exhibition at Altril, and several were forwarded to the Earl of Derby at Knowsley, where they were kept very well and last heard of.
The Tetraonidae comprehend the following subfamilies and genera:

1. Perdicinae.

   These Orypturidæ consist of the subfamily Orygyinia and the genus Oryctes, III.

   Mr. G. R. Gray, in his List of the Genera of Birds, arranges the Tetraonidae between the Phasianidae and the Chionitidae, with the following subfamilies and genera:


2. Tetraoninae.
   - Genera: Tetrao, Linn.; Lyurus, Sw.; Bonasa, Briss. (Bonasia, Bonap.); Centruroides, Sw.; and Lagopus, Briss.

   3. Ptericoline.

   Genera: Pterocles, Temm.; Syrrhaptes, Ill.

   Mr. G. R. Gray gives the synonyms of all these genera, and sufficiently numerous they are. The same author, in his List of the Genera of Birds, states that Chacura would have better been placed under the Caccobius, Kaup; and directs the reader to add near the genus Alectoris, Kaup, Tetrao, Gm.; also to add the genus Orestes, Kaup. He further remarks that Ocyptes is synonymous with Tymucus.

   We shall endeavour to illustrate this article with examples of the natural history of the grouse properly so called: an account of some of the leading forms of the family, taken in its more extensive sense, will be found under the respective titles.

   European Grouse.

   The following species are European — Tetrao Urogallus, the Great Black or Cock of the Woods; Tetrao Sibiricus, Sparrn. (Tetrao medius, Meyer), the Hybrid Grouse, or European Distribution; Tetrao Alpinus, generally considered by ornithologists to be a hybrid between the Capercalize and the Black Cock; Tetrao Tetricus (genus Lyurus, Sw.), the Black Grouse or Black Cock; Bonasia Europaea, the Hazel Grouse or Gelimote; Lagopus Scoticus, the Red Grouse; Lagopus mutus, the Common Pàrtnigan; Lagopus terrestris, the Rock Ptarmigan; Lagopus sylvestris, the Willow Ptarmigan; Lagopus brachy-chyclus, the Short-toed Ptarmigan; Pterocles arenae, the White-tailed Grouse; Pterocles setarius, the Pin-tailed Sand-Grouse.

   Of the Black Cock, the Red Grouse, and the Common Pàrtnigan, we shall confine ourselves to thebreast remarks, and especially the care of the Marquis of Breadalbane and of the nobleman of that name, and select as an example the Common Pàrtnigan, Lagopus mutus.

   Description — Winter Plumage (Male).—Pure white: a black band proceeding from the angle of the bill and traversing the eyes; lateral tail-feathers black, terminated by a white border; feet and toes well covered with woolly feathers; above the eyes a naked space, which is terminated by a small nuculated membrane; these naked parts are red; claws hooked, subulate, and black; bill black, with an iris ash-coloured. Length about fifteen inches and a quarter.

   Winter Plumage (Female).—Differing from that of the male in having the naked space above the eyes less, and no black eye-band. Smaller than the male; the length about fourteen inches and a half.

   Perfect Summer Plumage (Old Male).—Top of the head, neck, back, scapulars, and all the middle tail-feathers, as well as the upper covert, nuchal, crossed by numerous zigzags of deep black; breast and sides variegated with feathers of the same colour, among which are always found a great number of feathers of a deep black variegate, with scattered zigzags of a bright rust-colour; black eye-band always distinctly marked; throat most frequently white, but often marked with blackish; the whole of the belly, abdomen, lower coverts of the tail, wings, coverters, and feet pure white; eye-brows large, of a very lively red.

   Female always distinguished by the total absence of the black eye-band, and to be recognised also by the term of her plumage, which has less white; the head, all the upper parts of the body, the neck, the back, the breast, and abdomen streaked with transverse bands of black and white, with a good deal of regularity; only the male of the belly, the feet, and the wings are pure white. The wing are marked with very fine, sub-coloured, black and rufous streaks.

   N.B. The bird figured by Mr. Gould, in his great work, "The Birds of Europe," under the name of Lapagoce pàrtniga, the Rock Ptarmigan, with great doubt by that author, and confirmed by most other authors, is in reality the Lagopus mutus of Linnaeus; Lagopus vulgaris of Linn.; Pemnica Montagnia, Pemnica alpifera, and Lagano bianco of the modern Italians; Perdrisc blasche and (genus of the French); Perdris blancs de l'Espagne; Schneehuhn and Hausenfuss; Waldhauke of the Germans; Rype of the Norwegians; Rymarken (male), Rype (female) of the Icelanders; Turmachers of the Dutch; and Coriay yr Alban of the Welsh.

   Grouse are distributed throughout Europe, in England, Norway, Sweden, Russia. The Alpine districts of the middle and south of Europe. North America to islands lying in the south-west of Baffin's Bay. The hills keeping near the snow-line; Churchill, Hec (Franklin, Richardson).

   In the British Islands it was formerly found in the Ne of England, and, as its Welsh name indicates, it is now but it no longer occurs in those localities, nor is it a migratory bird in Ireland.

   Mr. Macgillivray (History of British Birds) states that it inhabits the bare and weather-beaten summits of the higher mountains of the middle and northern climates of Scotland; but, he adds, that even in the transition zone of the British Isles, that part of the mountains of which, being more than two thousand feet high, seem well adapted for it, no individuals are met with. 'I have frequently,' says this observer of natural history, 'seen it on Rona and other islands in Harris, and it is said to occur on Easdale in Loch Uist, on the Park and Uig hills in Lewis, on the Isle of Rona and Strath mountains in Skye, as well as in Mull and Iona. On all the elevated summits of the north of Scotland is not uncommon; and, on most of the Grampians, especially the great granite and slansums from which rise the sources of the Dee, the Spey, and the Tay, it was said to be even abundant. Great numbers are annually killed, but as the haunts of this Ptarmigan are not as accessible as those of the brown species (Lagopus Scoticus), it is not at all likely to be exterminated.

   Food, Habits, &c.—The summer food of the Partridge consists principally of alpine berries, and in winter of straw and stubble. Mr. Macgillivray states that the Par驾车 consumes a large quantity of fresh grasses of Caleus vivari-nis, Vaccinium Myrtillus, and Equisetum aegro, as well as the largest fragments not exceeding five-sixths of an inch in length. He adds, that leaves and twigs of Vaccinium, Rype, and Cynareae, vary less in size, and inSeptember, and other plants, with herbs in autumn, as well as the most part the same as that of the Red Grouse, or, in terms, it, the Brown Partridge.

   The author last quoted gives the following description:—
of the habits of this species from personal observation:

These beautiful birds, while feeding, run and walk among the herbaceous plants round about, and of rocks, from which it is very difficult to distinguish them when they remain motionless, as they invariably do should a person be in sight. Indeed, unless you are directed to a particular spot by their strange low croaking cry, which lasts a long time, and which is heard sometimes from a considerable distance, you would never detect their presence. When flushed they utter no sound, their object being to conceal themselves; and, if you discover the one from which the cry has proceeded, you generally find him on the top of a stone, ready to spring off the moment you show an indication of hostility. If you throw a stone at him, he rises uttering his call, and is immediately joined by all the individuals around, which, to your surprise, if it be your first rencontre, you see spring up one by one from the bare ground. They generally fly off in a loose body, with a direct and moderately rapid flight, resembling, but lighter than, that of the Brown Ptarmigan, and settle on a distant part of the mountain, or betake themselves to one of the neighbouring summits, perhaps more than a mile distant.

In these birds the males form flocks of fifty or more; and it is also stated that, during this season, they burrow under the snow, thus giving countenance to the statement and cut of Olau Magnus, copied by Gesner, showing that the 'Urogalli minores' lie hidden under the snow, and that, in retiring, it becomes either of a very long duration—two or three months, and 'sine cibo.'

Mr. Macgillivray states that early in the spring the Ptarmigan separate and pair. He describes the nest as a slight hollow, scantily strewn with a few twigs, and stalks or blades of grass, as regimental cap, about an inch and seven-twelfths in length, and an inch and from one to two twelfths across, white, yellowish-white, or reddish, blotched and spotted with dark brown, the markings being longer than those of the eggs in the ground. He states that the young run about as soon as they leave the shell, and are, from the first, so nimble and expert at concealing themselves, that a person who has accidentally fallen in with a brood very seldom succeeds in capturing one. The parent bird it seems has recourse to the same stratagems as the partridge and other gallinaceous birds to lead the intruder from her little ones. 'On the summit of the Harris mountains,' says Mr. Macgillivray, 'I once happened to stroll into the midst of a covey of very young ptarmigan, whose white plumage had almost disappeared among the stones, while the mother ran about within a few yards of me, manifesting the most intense anxiety and pretending to be unable to fly. She succeeded so effectually in drawing my attention to herself, that when I at last began to search for the young, not one of them could be found, although the place was so bare that one might have supposed it impossible for them to escape detection.

This species has been reared in confinement without any great difficulty, and has bred in a tame state (Selby).

Every one must have observed the numbers of Ptarmigan which are sent to this country early in the spring. The shops of many of the London poulterers are then positively white with them. These are imported from the north of Europe, where they are principally taken in snares made of horsehair. Mr. Yarrell states that he has more than once found a hair loose round the neck of Norway Ptarmigan in the London markets, and that others have found the same. The numbers taken are immense. According to Mr. Lloyd, whom we have so often had occasion to quote, one peasant will set from five hundred to a thousand of these snares in the winter season. The captured birds are kept alive during the winter, and the market is kept up even in this season, but not as large as in the spring. Mr. Grant informed Mr. Yarrell that he was assured, when in Norway, that the number of ptarmigan killed in that country every winter was beyond belief: two thousand dozen, if Mr. Grant remembered right, was the quantity exported from Drammen in one ship for England in 1839, and great numbers, he adds, are sent to the Copenhagen market. Mr. Yarrell goes on to state that besides those brought to this country from Drammen, great quantities are also received in London, during the months of February, March, April, and May, from Bergen, Drammen, and other ports on the west coast of Norway, whence conveyance is obtained for them in the boats which bring constant supplies of lobster to the London market. 'On one occasion,' says Mr. Yarrell, 'late in the spring of 1839, one party shipped six thousand ptarmigan for London, two thousand for Hull, and two thousand for Liverpool; and at the end of February or very early in March of the present year, the London market received fifteen thousand ptarmigan that had been consigned to him; and, during the same week, another salesman received seven hundred capercaille and five hundred and sixty black grouse.'

Common Ptarmigan in winter and summer plumage. (Gould.)

**Asiatic Grouse**

We select the Pin-tailed Sand-Grouse, Pterocles octacanthus, Ganga Catu, as an example.

**Description—Old Male.**—Throat black; sides of the head and front of the neck yellowish-ash; on the breast a large cincture, about two inches, of rusty orange, bordered above and below by a narrow black band; head, nape, rump, and tail-coverts streaked with black and yellowish; back and scapulars streaked in the same way, but towards the end of each feather there is a large band of bluish-ash, succeeded by another of a yellowish colour; lesser and middle wing-coverts marked obliquely with chestnut-red, and terminated by a white crescent; greater coverts olive-ash, terminated by black crescents; belly, sides, abdomen, thighs, and extremity of the lower coverts of the tail pure white; tail-feathers terminated with white, and the external one bordered with that colour; the two middle feathers, which are very long, slender, and of loose texture, are three inches longer than the others. Total length, without reckoning the long tail-feathers, 10 inches 6 lines.

**Female**—Differing much from the male; throat white; below this part a large black semicircular, which only extends to the sides of the neck; the cincture large and orange-coloured as in the male; upper parts nearly the same; middle, lesser, and greater wing-coverts bluish-ash, then an oblique reddish band, and all the feathers terminated by black crescents; the two long tail-feathers or filaments are longer than the others by an inch and six lines.

**Young before their first moult.**—Plumage less variegated; upper parts olive clotted with ash; the white of the sides, the thighs, and the abdomen is barred with yellow and brown zigzags. (Temm.)

**Geographical Distribution.**—Very numerous on the arid plains of Persia. Not very numerous in France, on the sterile 'Lande's' near the Pyrenees, and along the coasts of the Mediterranean; less common in Provence and Dauphiné, where they occasionally arrive; more common in Spain, Sicily, Naples, and throughout the Levant. Temminck, who gives these localities, states, in the fourth part of his Manuel, second edition, that it is common in Provence, in the uncultivated plains of Crau, and says that it avoids cultivated tracts, and only inhabits the sterile Landes of the south; but he adds that it is abundant in the Pyrenees, and that it is to be found all the year round in the markets of Madrid. Mr. Gould states that the species is found in the North of Africa.

**Food, Habits, &c.**—Seeds, insects, and the young shoots

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or pants form the food of this sand-grouse: but its wild
nature and the barren places which it frequents are adverse
to observation; and little or nothing is known of its habits.
The nest is a hollow in the earth, and, according to Tem-
minek, the eggs, nearly of the same size at each end, of an
Isabella grey, marked with small brown points and large
black patches, are only two or three, a small number com-
pared with those of the majority of the Tetraonide.

Pin-tailed Sand-Grouse, male and female. (Gould.)

AFRICAN GROUSE.

Dr. Andrew Smith remarks, that though we find species
of Pterocles beyond the confines of Africa, yet the major-
ity of those now known are peculiar to that quarter of the
globe. The regions south of the equator, he observes,
have furnished nearly as many species as those to the north
of it; and he thinks that both will doubtless afford many
additional ones when the yet unknown districts shall have
been thoroughly explored. Each of the known species, as
far as his observations go, has a limited range; and should
the range of such as inhabit the unexplored tracts of the
interior not be greater, he is of opinion that we may in
time expect great additions to the following list of known
species which he gives:—

Pterocles arenatus, Temm., Barbary and Senegal; Pte-
rocles guttatus, Licht., Egypt; Pterocles quadricinctus, 
Temm., Senegal; Pterocles coronatus, Licht., Nubia; Pte-
rocles Lichtensteinii, Temm., Nubia; Pterocles trien
ticus, Swain., Senegal; Pterocles exustus, Temm., Egypt and 
Senegal; Pterocles Tuchypetes, Temm., South Africa; 
Pterocles bicinctus, Temm., South Africa; Pterocles sim-
pler, Roux, South Africa; Pterocles maculosus, Burcheill, 
South Africa; Pterocles gutturalis, Smith, South Africa.
It will be seen that Pterocles setarius, to which Mr. Gould
assigns South Africa as a locality, is not in Dr. Smith’s list.
We select as an example Pterocles gutturalis, Smith.

Description.—Male.—Top of the head dull green, faintly
freckled with black; sides of the head and chin straw-
yellow; eyes, bill black; neck, breast, and a portion of each
shoulder intermediate between oil-green and sulphur-
yellow; bases of all the feathers pearl-grey; immediately
behind the yellow chin, the throat and sides of the neck
are crowned by a deep brownish-black crescent. Inter-
scapulars and scapulars clouded with pale reddish-brown,
pearl-grey, and bluish-black or brownish-black, the latter
generally prevailing towards the quills. Back and upper
tail-coverts pearly grey, strongly tinged with brown, and
when the feathers are separated, each is found with a yel-
lowish tint at the base, and with a strong satin lustre.
Secondary wing-coverts intermediate between Dutch and
reddish orange, with the base and a considerable portion
of the inner vane of each pearl-grey; primary wing-
coverts and all the mid-wing feathers umler-brown; secondaries
narrowly tipped with rusty-white; tail-feathers blackish-
brown, the outer vanes edged with pearl-grey, and all,
extep the two middle ones, broadly tipped with the same
colour as the secondary quill-coverts. Belly and under-
tail-coverts between chestnut and reddish-brown. Bill and
claw dark horn-colour; eyes dark brown; toes greenish-
brown. Wings when folded nearly reaching the tip of the
tail; first quill-feather rather longer than the second;
longest of the tertaries intermediate between the sixth
and seventh quill-feathers; tail wedge-shaped, the two
middle feathers rather the longest and acuminate at their
extremities; outer and inner toes of equal length. Total
length 12 inches 6 lines.

Pterocles gutturalis: male and female. (Smith.)

Locality, Food, Habits, &c.—Dr. Smith states that the
species was first discovered in lat. 25° 30′, about sixty
miles to the eastward of Latakoo; and it was here
remarked its cry to differ from that uttered by Pterocles
Tuchypetes, Temm., that he was led to suspect that it was
distinct. He says that, in common with the other Senega
colored species of this genus, it remains in large flocks
regular and fixed periods to localities where water is near
that at such times specimens are most readily procured;
but he warns the sportsman to be quick in his movements
as they scarcely reach the water before they are seen at
the wing. As they approach and recede from such spots
they almost incessantly utter cries resembling terra dem
trees.

Dr. Smith remarks, that from observing these birds
when they are in quest of water, one would be disposed
to consider them gregarious, a notion soon dispelled
when their feeding-grounds are discovered, for they are
generally dispersed singly or in pairs, and the occa-
sional congregation is only effected by solitary individu-
als successively joining others who are on their way to
a greater distance. Pterocles gutturalis seeks the same
habitat about ten in the morning and three in the afternoon,
moving in this respect Pterocles Tuchypetes, which has
habits a different part of the country. Pterocles gutturalis,
he tells us, drinks during the early part of the morn
and Pterocles bicinctus in the dusk of the evening, or
early part of the night. In such an arrangement, he says,
we must admit design; for if all the various spe-

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were to experience thirst at the same time, both delay and difficulty would occur in quenching it, since, owing to the general scarcity of water in the districts inhabited by these birds, hunks of earth and grass-seeds even when present, are often to be seen fringing the brink of a pool for hours together, and occasionally disputing for the first sip. Dr. Smith found grass-seeds, ants, and abundance of gravel in the stomachs of most of the individuals which he procured. The female eggs are somewhat smaller, and are of the same size at each end, of a dirty-white or cream-colour, marked with irregular streaks and blotches of pale rusty and pale grey or ash-colour, upon the bare ground, without and without. The former habit of the warm season; and it is only when level spots fitted for the reception of the eggs cannot be readily obtained, that the birds of this genus, according to Dr. Smith, bestow any labour on the preparation of nestling-places. Nothing, he adds, is ever interposed between the eggs and the soil, and indeed whatever is calculated to separate them is carefully avoided. Almost as soon as the young escape from the shell, they take to a wandering life, and remove from place to place with the parent-birds in search of food. (Illustrations of the Zoology of South Africa.)

**AMERICAN GROUSE.**

America possesses several species of grouse, consisting of the genera and subgenera: _Bonasa_, or _Bonasa_; _Tetraon_, _Lapagous_, and _Centrocercus_. We have already noticed the Ruffed Grouse (_Bonasa_), and here select for example _Centrocercus urophasianus._

Description.—Male of this kind, of upper-plumage, light hair-brown, mottled and variegated with dark umber-brown and yellowish-white. Each feather of the back with three bands of yellowish-white at equal distances from each other, the lowest narrow, the middle one broad, and the outer one at the tip of the feather almost obsolete; between these the colour is hair-brown, prettily marked with small irregular zigzags of light hair-brown: these colours cross the shaft; but on the wing-covers and scapulars the shafts are all marked by a narrow conspicious line of yellowish-white. On the tail there are about eight bands of this colour, the lower ones being tolerably defined, but those towards the ends obscure: the margins are zigzagged, and bordered by dark umber-brown, with irregular zigzag lines of the same, upon a light hair-brown ground, between each bar. Quills light, and almost unspotted; narrowed extremities of the tail almost black. Under plumage white, unspotted on the breast and part of the body; but dark umber-brown, approaching to black, on the lower half of the parts of the body. The inner side of the tail-feathers varied with the pitch of the shafts of all the feathers. On the breast black, rigid, and looking like hairs; scale-like feathers of the sides white and thicker. Bill, which is thick and strong, and toes blackish. On each side of the breast two prominent naked protuberances, destitute of hair and feathers, more forward than the analogous pairs in _Tetraon Capido_. On each side of the protuberances and higher up on the neck, a tuft of feathers, having their shafts considerably elongated and naked, gently curved and tipped with a penicil of a few black nuclei. These tufts occur at the same part as those of the Ruffled Grouse, but are placed much behind the naked protuberances in the specimen from which the description was taken; so that they do not appear intended to cover the throat when not inflated. On the sides of the neck and across the breast, below the protuberances, the feathers are very short, rigid, and acute, overlying each other like the scales of a fish. Wings short in proportion; lesser quills ending in a small point, the inner next to the base, considered each feather lanceolate and gradually attenuated to a fine point. Tarsi thinly clothed with feathers to the base of the toes. Length 31 inches 6 lines.

**Female.**—Whole upper plumage, tail, wing-covers, tertials, and sides of the neck, and sides of the breast, dark umber, or blackish-brown, and yellowish-white, irregularly barred and mottled in nearly equal quantities; but the dark colour forming larger blotches towards the base, and the lighter colour bars on the tip of the shafts.

F ore part of the belly white, barred with black; hinder parts black. Plumage of breast and neck of ordinary form, there being no scale-like feathers nor projecting shafts as in the male. Length 22 inches 6 lines. (Fauza Borasii-Americana.)

This is the _Tetraon urophasianus_ of the Prince of Canino, the Cock of the Plains of Lewis and Clark, and the _Pygmae_ of the Kyuse Indians.

**Food, Habits, &c.**—The favourite food of this species is said to be the pulpy-leaved thorn, but it probably feeds also on buds and berries.

This grouse appears to have been first recorded by Lewis and Clark; and since since have become familiar to the fur-traders on the banks of the Columbia. Dr. R. H. Barlow gives the following interesting account of its habits by the late Mr. David Douglas—:

The flight of these birds is slow, unsteady, and affords but little amusement to the sportsman. From the dispersedly-stationed, small, thin-quilled wing—so thin, that a vacant space half as broad as a quill appears between each—the flight may be said to be a sort of fluttering, more than anything else: the bird giving two or three claps of the wings in quick succession, at the same time hurriedly rising, then shooting or floating, swinging from side to side, gradually falling, and thus producing a clapping, whirring sound. When startled, the voice is "Chuck, chuck, cuck," like the common Pheasant. They pair in March and April. Small eminences on the banks of streams are the places usually selected for celebrating the weddings, the time generally about sunrise. The wings of the male are lowered, buzzing on the ground; the tail spread like a fan, somewhat erect; the bare yellow oesophagus inflated to a prodigious size,—fully half as large as his body, and, from its soft membranous substance being well contrasted with the scale-like feathers below it on the breast, and the flexible silky feathers on the neck, which on these occasions stand erect. In this grotesque form he displays in the presence of his intended mate a variety of attitudes. His love-song is a confused, grating, but not offensively disagreeable tone,—something that we can imitate, but have a difficulty in expressing—"Hurt-Ar-churr-rr-rr-rr-rr, hurr-rrrrrr-rr" ending in a deep hollow tone, not unlike the sound produced by blowing into a large reed. Nest on the ground, under the shade of _Purshia_ and _Artemisia,_ or near streams, among _Phalaris arundinacea,_ carelessly constructed of dry grass and slender twigs. Eggs, from thirteen to seventeen, about the size of those of the common fowl, of a wood-brown colour, with irregular chocolate blotches on the thick end. Period of incubation twenty-one to twenty-two days. The young leave the nests a few hours after they are hatched. In the summer and autumn months these birds are seen in small troops, and in winter and spring in flocks of several hundreds. Plentiful throughout the barren arid plains of the river Columbia; also in the interior of North California. They do not exist on the banks of the river Missouri, nor have they been seen in any place east of the Rocky Mountains. (Fauza Borasii-Americana.)

Nuttall says that the flesh is dark and less palatable than that of other species.

TETRAPLA. [Oregenes.]
TETRARCH (τετραρχή), from two Greek words, signifying 'four and to govern,' a title used by the Greeks at a very early period to describe the ruler of each part of a country which was divided into four parts, either on account of the natural limits of the tribes inhabiting it, or as a political division. Each of such four parts was called a tetrarchy (τετραρχία or τετραρχική). In process of time the title came to be applied to the rulers of different divisions of their country, the chief of each tribe in the same country, without any reference to the number four. In this sense it was equivalent to the titles etnarch and phyarch. Under the Roman government, in the later ages of the republic and under the emperors, this title was applied to petty principalities or counties, other, but tributary to Rome. These tetrarchies, ethnarcha, or phyarcha, were either the legitimate governors of their subjects, or persons who had received the title and government from the Roman emperor, for a mark of favor. They ranked above those other subjects princes who were permitted to retain the title of king.

The principal examples of tetrarchies are those of Thessaly, which was antiently so divided, and the division was again made by Philip, the father of Alexander the Great; of Galatia, which was peopled by three Gallic tribes, each of which was divided into four tetrarchies: of Syria, many of the petty princes of which bore the title of tetrarchs, especially certain princes of the family of the Herods the Great. Concerning the tetrarchies of Syria, see Niebuhr's History of Rome, ii., pp. 134-5.

TETRAX, Dr. Leach's name for one of the BUSTARDS placed by Mr. G. R. Gray in the subfamily Otudinae of the family Gallinaceae. Example, Otis tetras, Linn.

TETRICAUS, CAIUS PESUVIUS, a Roman senator, one of the numerous usurpers of the Imperial purple in the third century A.D., who are distinguished in Roman history by the name of the Thirty Tyrants. He was the governor of Aquitania, and, after the death of several pretenders in Gaul, was made emperor there, A.D. 268, by Victoria, said to be his kinswoman, and the widow of Victorinus, who had reigned for a short period unusually: but after the accession of Aurelian, finding himself unable to control the turbulent and licentious soldiery who sustained his power, and becoming weary of their crimes, he invited the new emperor into Gaul, and resigned his usurped dominion in the following manner. Dreading the resentments of his troops if he deserted them openly, he pretended to prepare for an engagement near Châlons in Champagne, and then betrayed his army into the hands of Aurelian, who was then at the siege of Tarragona; but Victorius (Aurelianus, Historia Augusta) says that it took place subsequently. The triumph of Aurelian, A.D. 274, was ennobled by the presence of the queen of the East, and of Tetricus and his sons; and afterwards, when the two pretenders were treated by his conqueror with every mark of distinction during the remainder of his life, and was made corrector of Lucania according to Victorius and other writers, or of all Italy, if we follow Trebellius Pollio. His son Tetricus, who had been made Caesar by Victoria, met with not less favour than his father at the hands of Aurelian, and was honoured with senatorial dignity. On the coins of Tetricus, which are extant in gold, silver, and copper, we find D. M. N. C. AUG. TETR., IMP. TETRAX.; with, on the reverse, IMP. CL. CLAVDIVS. AVG., which, as Eckel (Dott. Vet. Num.) remarks, would imply an alliance between him and Claudius Gothicus. Spow (Miscel., 274, Lugd., 1868) gives an inscription on a marble found at Rouen with the titles of Tetricus more at length: C. PESVIO. TETRICO. NOBILISSIMO. CÆSAR. F. AVG. L. I. I. Coins struck in the name of the younger Tetricus yet remain. (Trebellius Pollio, "Trigint. Tyr."

TETRADOX, a genus of fishes of the order Plectognathi. These fishes, instead of having distinct teeth as usual in the class, have the jaws provided with a substance resembling ivory, formed somewhat like the beak of a bird, and capable of extensive opening and closing, upon the same plan as the jaws of birds do. All the Tetrodon, or Frederiksdon, are very closely allied genera, having the power of inflating the body with wind, or rather a membrane which extends along the under side of the abdomen, which causes them to float on the surface of the water, without the power, it is said, of directing their course: the membranes when inflated, gives to the fish an almost spherical form, and is usually defended by spines and prickles. The posterior fins are rather small; and besides these and the fin, they have one dorsal and a ventral fin. The Diodon have but one large tooth above and below, and are usually protected by large strong spines. The Tetrodons are distinguished by the possession of four large teeth, the jaws being arranged by a central suture. These fishes are confined to the seas of warm climates: some of them are called Globe-fishes.

TETUAN, [Marocco.] TETULAS. TETUCRIMUS, Teucer, son of Scamander, and father-in-law of Dardanus, king of Troy: he is the name of a genus of plants belonging to the natural order Lamiaceae or Labiate. It has a tubular 5-toothed, nearly equal or subequal, calyx and corolla. The tube of the corolla and the calyx, the upper lip is abbreviated and bipartite; the lower lip is longer, spreading, and trifid. The stamens are much exerted, and the cells of the anthers are confluent and spreading. The species are herbs and shrubs inhabiting most parts of the earth, and having a variable habit and inflorescence. Upwards of seventy species are described in Don's Miller's Dictionary. Of these comparatively few are known in this country; some of them are cultivated in our gardens, and are three natives of the British isles.

T. Scorodonia, Wood Germander, or Sage, has cordate, downy, petiolate, crenate leaves; the flowers are of a pale yellow colour, with violaceous stamens, and are arranged in flat-topped, many-flowered inflorescences. The stem is erect, hispid, pubescent, or nearly glabrous. It is a native of Europe in woody hilly situations, where the soil is dry and stony. It is not an uncommon plant in Great Britain. The smell and taste of this plant resemble very much the smell and taste of the J. A. in Jersey, and is called Amorica, the inhabitants use it as a substitute for hops in their beer; and by some persons the bitter given by the Germander is preferred to that of the hop.

T. B. Tetricus, Wood Germander, has oblong sessile downy serrate leaves; flowers purplish, arranged in axillary whorls, 2-4 flowers in each; the stem is procumbent and villous. It is a native of Europe and the temperate parts of Asia in boggy wet places. It is a rare plant in Britain. Its fresh leaves are very bitter and rather pungent, having a smell similar to garlic. It had once a great reputation in medicine, but is now seldom used: it might however be employed in cases where an aromatic bitter is desirable.

T. Chamadrys, Wall or Common Germander, has over to inciso-serrate leaves, tapering to a footstalk; the flowers are reddish-purple, and arranged in axillary whorls of three flowers; the stem is ascending, and most frequently villous. It is a hardy perennial, with opposite, oblong, opposite, and spreading, and rocks and dry places. It is only rarely found in Great Britain. This plant was once much employed in medicine, and entered as an ingredient into the celebrated Portland powder. It has the tonic aromatic qualities of the family to which it belongs, which frequently render them valuable in diseases connected with depressed powers of the nervous system and digestive organs.

T. Marum, Cat-Thyme, has small oval quite entire leaves, pointed at the end; and small, white, and balsamic flowers. It is a native of the region of the Mediterranean. When the leaves are rubbed between the fingers, they emit a volatile aromatic smell, which excites sneezing, and on the account it is used as an erineum, and forms an ingredient of the pudix us us cortexus of the Pharmacopoeia. It has been recommended as a stimulant and aromatic in various diseases, but is not much used. Cats are very fond of it, and destroy it when they get near it.

T. Polium, Wild Sage, is a perennial or biennial plant, with oblong or linear leaves with revolute edges; whorls few, condensed into globular terminal heads; stems procumbent, much branched. This plant is a native of Europe and Africa, on the shores of the Mediterranean. According to soil, situation, and aspects, it has been called the field Sage, the garden Sage, and the mountain Poly. It has been much cultivated and extensively grown in gardens, and is used for the purposes of the medicinal herb. It has been recommended as a stimulant, aromatic, and tonic; and for the promotion of the glomeruli of the kidneys, and the healing of ulcers of the skin.

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In the cultivation of the Germaner a dry soil and shady situation are best. The annual kinds are best propagated by seeds sown in an open border. The perennial and shrubby kinds are readily increased by division and by cuttings of the young wood.

TRITHIDE, Professor Owen's name for the Calamarians, his fourth family of Decapodous Cephalopods, derived from Teuthos (τεύθως), applied by Aristotle to the less-armed Mollusca with an internal horny plate or gladius of each outline of the family will be found in the article TETRABRANCHIA.

Family Character.—Animal, body sometimes oblong and depressed, generally elongated and cylindrical; with a pair of eyes in the front, the mantle and position, but generally broad, shorter than the body, and terminal.

Shell internal, rudimental, in the form of a thin, straight, elongated, horny lamina; encysted in the substance of the dorsal aspect of the mantle. (Owen.)

Professor Owen divides the family into the following sections:

Section A.

Genus, Sepiolitella, Blainville.

Generic Character.—Body oval, flattened, with narrow long fins extending the whole length; anterior margin of the mantle unattached. Horny hooves of the acetabula with denticulated margins. Gladius or rudimental shell long and wide. (Owen.)

Example, Loligo vulgaris. The common Calamary, or Penfish, abundant on our coasts.

Genus, Onychoteuthis, Lichtenstein.

Generic Character.—Body oval, flattened, with narrow long fins, extends the whole length; anterior margin of the mantle unattached. Horny hooves of the acetabula with denticulated margins. Gladius long and broadest in the middle. (Owen.)

Example, Sepiolus robustus. Leach.

Section B.

Genus, Loligopsis, Lamarck.

Generic Character.—Body long and cylindrical, terminated by a pair of conjoined, large, round, fins, forming one segment of it, and united to the end of the mantle; anterior margin of the mantle adherent to the back of the head; fins advanced, circular, short, subdenticulate, distant and subdorsal. Gladius short and narrow. (Owen.)

Example, Sepiolis robustus. Leach.

Genus, Loligo, Cuvier.

Generic Character.—Body elongated, sacciform; anterior margin of the mantle adherent to the back of the body, short, rounded, subdenticulate, approximate, oral, and subterminal. Gladius long and narrow. (Owen.)

Example, Sepiolis echinatus. Leach.

Such are the arrangement and definitions given by Professor Owen in the Cyclopaedia of Anatomy and Physiology. The family appears to us to be truly natural; and the definitions are very accurate. The views and definitions of other authors regarding the forms belonging to this division, and an illustration of the forms themselves, will be found under the names TEUTOBERGER WALT. [GERMANY.]

TEUTONIC NATIONS is the general name under which are comprised the different nations of the Teutonic race, which is divided into three branches: the first division contains the High Germans, to whom belong the Teutonic inhabitants of Upper and Middle Germany, those of Switzerland, and the greater part of the Germans of Hungary; the second is the Saxonian branch, which is divided into three minor branches: the first of which contains the Frisians, and the second contains the Old Saxons or Low Germans, with the Dutch, the Flemings, and the Saxons of Transylvania; and the third contains the English, the Scotch, and the greater part of the inhabitants of the United States of North America. The third branch is the Scandinavian, to which belong the Icelanders, the Norwegians, the Danes, and the Swedes. Upwards of eighty-two millions belong to this branch. The Germans amount to about forty-two millions, thirty-three of which live in Germany, the remaining eight or nine millions form a greater or less part of the population of East Prussia, a part of Poland, of Hungary, of Transylvania, of France (in Alsace and northern Lorraine), of Russia (in the Baltic provinces, in the kingdom of Poland, in the Crimea, in Bessarabia, and in the German colonies in the environs of Saratov on the Volga), of the duchy of Slesvig, and of the United States of North America, especially Pennsylvania. The English amount to twenty-eight millions, there being about sixteen millions of English and Scotch in Great Britain and Ireland, two millions in the English colonies, and about ten millions of Anglo-Americans in the United States. The number of Norwegians is one hundred and thirty thousand, in the province of West Friesland in Holland, in the islands in the German Ocean along the Dutch and the German shore, in the Saterland (near Oldenburg), in the islands west of the island of the duchy of Sleswig. There are about three millions of Dutchmen in Holland, and in her colonies and the Cape of Good Hope; and there are about two millions five hundred thousand Flemings in the north part of Belgium, and in the duchies of Holland, in the north part of France. The number of individuals belonging to the Scandinavian branch amounts to about six millions, among whom there are nearly fifty thousand Icelanders; about a million five hundred thousand Norwegians; and about three millions two hundred thousand Swedes in Sweden and in the present Russian province of Finland, around the shores of the Gulf of Bothnia, in the districts of Abo and Nyland, and on the Aland islands, which are entirely inhabited by Swedes.

Light hair and blue eyes in the northern countries, and brown hair and brown or blue eyes in some of the southern countries, are characteristics of the Teutonic race. Their stature is generally tall, although in those provinces where the Germans are mixed with Wends, Sorabians, and Bohemians, many of the people have the broad shoulders and the short square form of the north-western Slavonians. The straight black hair of some Slavonian tribes also sometimes appears. The mixture of Germans with the south-western Slavonians, such as Wends and Croats, whose stature exceeds that of the Wends and Bohemians, is more common among the Slavonian tribes, the darker complexion being almost the only indication of such a mixture. The mixture of Germans with Celts in Belgium and in the adjoining part of France has formed a tall race which differs from their Teutonic neighbours only in the dark colour of their hair and their black eyes. (Plate, Seiten aus dem Volksleben in Belgien.)

It is very difficult to distinguish the descendants of English and Irish parents as belonging either to the Teutonic or the Celtic race, though it appears that aquiline noses are seen among the lower classes they are a proof of Celtic origin, the true Teutonic nose not being aquiline, but either straight or curved only in its upper part. In general also the Teutonic forehead is broader between the temples than the Celtic. (Clement-Delaroze, Die Welt; Herder, Ideen zur Philosophie der Geschichte, vol. i.)

The moral and intellectual differences between the Teutonic nations is less remarkable than that which exists between other European nations the same race divided into another. Capable of strong and violent passions, they do not easily lose their self-control, the intellectual functions being more developed than in most other races. Southern nations, confounding liveliness of feeling with intensity, and nervous irritability, have the cool character of the Teutonic nations, and have accused them of indifferency. But the most superficial examination will show their sensibility, a fact which is proved by their poetry. The Teutonic nations are less excitable
than the Celtic, the Slavonian, and other races, but capable of deeper thought. Southern nations have accomplished great things by sudden efforts; the Teutonic nations have reserved their enterprise for vast plans, which it requires centuries to carry into effect. Thus they destroyed the Roman empire after a struggle of three centuries, and they formed new kingdoms in Europe upon new social principles, which have maintained their vigour to the present day. The Normans became powerful wherever the sea afforded them a footing. The English, the Franks of Gaul, who have been reduced to a state of quiet obediencę, was always regarded as derived from the people. The idea of ruling, expressed by the root Teut, explains why this word occurred so frequently in the names of the conquerors of the subjugated nations. The conquests which followed them are a general name in which there was neither absolute monarchy, power, nor absolute submission to their church. This corresponds exactly to the political state of the ancient Teutonic nations, among whom the sovereignty was in the people, and their church was not a state religion. The idea of ruling, obeyed, always came from the people.

The English colonies have spread over the world: their dominion in the east and in the west is the result of plans which imply more boldness of conception, more prudence in execution, and more reflection, than the conquests of Alexander the Great and the ephemeral power of Napoleon.

The same character of deep and patient reflection exercised on great objects appears in German philosophy and in the inventions of the Teutonic nations. While in the arts of painting are Teutonic inventions. They have subjugated the power of steam; and the first model of the modern sea- vessel was constructed at the mouth of the Elbe by hands of an old boat-builder. (Gott. Miil. Verh. 1840, p. 24.)

The name of the Teutones was made known to the ancients by Pythias of Massilia (Marseille), who, in the age of Alexander the Great, about 322 B.C., discovered a nation of that name in the Chersonesus Cimbria, and on the ad


tinent in the present state of Bessieg, Denmark, and perhaps also in the southern extremity of Sweden. It seems that they had long been settled there, for they lived in houses, and were acquainted with agriculture and commerce. Among the Celtic tribes which invaded Greece and besieged Delphi under the second Brennus (B.C. 278), there was a people called Teutobodaci, who afterwards passed the Hellespont and settled with the Celts in Asia Minor. About a hundred and sixty years later, the Romans were attacked by the Cimbri and Teutones, who came from the same country, where they had been seen by Pythias. The Teutonic origin of the Cimbri has been disputed: some historians consider them identical with the Celtic Cymri; but this error has been long since refuted, although it has been reproduced in our days by Thierry, in his 'Histoire des Gaulois.' It is said, and it is not improbable, that inundations of the sea compelled the Cimbri and their neighbours the Cimbræ to leave their country and to seek other abodes. The choice was soon made. The wealth of Rome and the arts of Greece were not unknown to them. From the most remote times adventurous merchants, starting from the shores of the Ocean, have followed the Rhine and the Danube, its sources, and reaching the Duna and the Niemen, descended these rivers to their mouths in the Baltic, where they exchanged the commodities of the south for amber, the electrum of the ancients. The same trade, as it seems, was carried on by the merchants of Massilia along the Rhone and the Rhine, and therefore Schliëzer, in his 'Nordische Geschichte,' says that but for the amber Germany would have remained unknown to the ancients for five centuries. Their acquaintance with Rome and Massilia was perhaps the principal cause which led the Cimbri and the Teutones to the south of France and to Italy (B.C. 113-99). Their destruction by Marius has been related. [MARIUS. CUMM.] When the Romans first heard the name of the Teutones, they thought that they were a single tribe. They did not know that it was also the general and ethnographic name of all those nations to which they afterwards gave the name of Germans.

Origin of the name Teutones. — The root of the word Teuton is thus or do, which originally represented the idea of 'activity,' of 'living, procuring, nourishing,' and also of 'taming, educating, and ruling.' This root is found in many dialects, as in the popular Teut, Thun, Thuo; that or these, earth; tot, tot, and so in the popular dialects: — Teut, God, creator, ruler, father, nourisher (Thor, Tuino); that or these, earth; tot, tot, godfather; toda, nurse; thald, father of the people, lord, ruler, king, in Gothic thiduna, in old Bavarian thedoa; diut, people, in old Swedish thidun, and thidunus, in Gothic, kingdom. (Fulda, Worterbuch.) The names of king and of people being both derived from one root, which expresses the notion of ruling, is a fact which proves the Teutonic origin of nations which entered a region which there was neither absolute monarchy, power, nor absolute submission to their church. This idea of the name Teut, explains why this word occurs so frequently in the names of the conquerors of the subjugated nations. The conquests which followed them is a general name in which there was neither absolute monarchy, power, nor absolute submission to their church. This corresponds exactly to the political state of the ancient Teutonic nations, among whom the sovereignty was in the people, and their church was not a state religion. The idea of ruling, obeyed, always came from the people.

The English colonies have spread over the world: their dominion in the east and in the west is the result of plans which imply more boldness of conception, more prudence in execution, and more reflection, than the conquests of Alexander the Great and the ephemeral power of Napoleon.

The same character of deep and patient reflection exercised on great objects appears in German philosophy and in the inventions of the Teutonic nations. While in the arts of painting are Teutonic inventions. They have subjugated the power of steam; and the first model of the modern sea- vessel was constructed at the mouth of the Elbe by hands of an old boat-builder. (Gott. Miil. Verh. 1840, p. 24.)

The name of the Teutones was made known to the ancients by Pythias of Massilia (Marseille), who, in the age of Alexander the Great, about 322 B.C., discovered a nation of that name in the Chersonesus Cimbria, and on the ad


tinent in the present state of Bessieg, Denmark, and perhaps also in the southern extremity of Sweden. It seems that they had long been settled there, for they lived in houses, and were acquainted with agriculture and commerce. Among the Celtic tribes which invaded Greece and besieged Delphi under the second Brennus (B.C. 278), there was a people called Teutobodaci, who afterwards passed the Hellespont and settled with the Celts in Asia Minor. About a hundred and sixty years later, the Romans were attacked by the Cimbri and Teutones, who came from the same country, where they had been seen by Pythias. The Teutonic origin of the Cimbri has been disputed: some historians consider them identical with the Celtic Cymri; but this error has been long since refuted, although it has been reproduced in our days by Thierry, in his 'Histoire des Gaulois.' It is said, and it is not improbable, that inundations of the sea compelled the Cimbri and their neighbours the Cimbræ to leave their country and to seek other abodes. The choice was soon made. The wealth of Rome and the arts of Greece were not unknown to them. From the most remote times adventurous merchants, starting from the shores of the Ocean, have followed the Rhine and the Danube, its sources, and reaching the Duna and the Niemen, descended these rivers to their mouths in the Baltic, where they exchanged the commodities of the south for amber, the electrum of the ancients. The same trade, as it seems, was carried on by the merchants of Massilia along the Rhone and the Rhine, and therefore Schliëzer, in his 'Nordische Geschichte,' says that but for the amber Germany would have remained unknown to the ancients for five centuries. Their acquaintance with Rome and Massilia was perhaps the principal cause which led the Cimbri and the Teutones to the south of France and to Italy (B.C. 113-99). Their destruction by Marius has been related. [MARIUS. CUMM.] When the Romans first heard the name of the Teutones, they thought that they were a single tribe. They did not know that it was also the general and ethnographic name of all those nations to which they afterwards gave the name of Germans.

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account of their Aryan origin is given in their ancient lingual songs, principally in the Sagas of the Scandina-

vians. The recollection of their ancient homes was not altogether lost in Germany in the eleventh century, for we find the following verses in the "Lobgesang auf den Heil-

igen Ansto":

"Denn Geschichte des quan willt se

Von Armeute der heid.*

Mein Vaterland late ich noch se.

Die der Deutschen geschenh,

In griech. India steh."
art of writing [Italic Letters], although only for religious purposes. (Rhabanus Maurus, in Goldst., Script. Rev. Alam., ii, p. 67; Hickey, Thea, Ling. Septentr.) The groundwork of their social and political constitution was the division of a certain number of families, called "Marcha," "er-marcha," now "Mark-Genossenschaft." Several marches formed a "gouv," now "gau," a district which had its own administration. Twice a month, and sometimes every week, members of a "gouv" assembled on the market or in some public place, where civil and criminal courts, and also meetings for legislation, and war and peace were decided on them. Besides the gowdings there were "graven" or "grenven" (gravitations, convents), or delegates of the gowding, who were assisted in their functions by a certain number of free men. The magistrates were chosen from the nobles (seldings or adelings), the princes of Tacitus, who had also the right of forming a kind of senate, where they deliberated on important affairs previously to their being brought before the gowding, and they dispensed matters of little importance, which did not come before the gowding. The nobles had also the privilege of keeping a "dienst-gefolge," or a band of freemen who served them in their commands, and they had the right of protecting unfree people in the gowding, a right which also belonged to the community as a body, but not to individual freemen. The privileges of the nobles were probably connected with the religious institutions of which we have no knowledge, although it appears that priests and nobles formed only one class, an opinion which is corroborated by the fact that wherever Christianity was introduced into Germany, it met with no opposition from the free men, so soon as the church came to them. Some of the earlier Teutonic nations had hereditary kings, the "reges" of Tacitus, who however had a very limited authority. The greater part of them chose princes only as commanders of the army in time of war. The name of their commanders was "barog," in low German "bertog," or "bortog," in Latin "dux." Beside the freemen and the nobles, there were bondsmen, "tazi," "lati," or "liti," now "leute," in low German "lute," or "lude," who were either the primitive inhabitants or a conqueror's free men or freemen who had lost or sold their liberty. Their condition was in no way like that of the Roman Servi, who, legally speaking, were not considered as persons, but in most respects things. Domestic and personal services, and especially agriculture, were their exclusive occupations.

The military organization of the Teutonic nations was founded on two principles. When a gau, or a confederation of several gau's, determined on war, every freeman was to choose one of the free men for his representative in the commonwealth. These wars had rather a defensive character, and they occurred principally among the inhabitants of northern Germany between the Baltic and the Rhine. But war was sometimes made for the private interest of some powerful nobles, who carried it on with his "dienst-gefolge," which was a numerous body when the military renown of the chiefs, or the hope of easy conquests, promised rich rewards to the adventurous band. These were generally offensive wars, and we find that they occurred chiefly among the Suevian nations.

We know little about the religion of the ancient Teutonic nations. They worshipped a supreme being under the name of Woden or Odin, but the true character of this religion is lost. The worship of the gods and the worship of the sorcerers, or "grioth," were the manifestations of the power of heaven, of earth, and of love and preservation.

Such was the moral, social, and political state of the Teutonic nations when they began their wars with Rome. The Vallum Romanum prevented them from invading the Roman empire during the first and second centuries. In the third century they often crossed it. In the fourth they overran the provinces of the empire. In the fifth they invaded and conquered all the European provinces of the Roman empire. Instead of following the chronological order, which would cause confusion, we shall give a view of all these invasions by respective centuries, according to the people by which they were effected.

Alemanni. [AlemannI.] Towards the middle of the fourth century swarms of people belonging to the Suevi came from north-eastern Germany to the country between the Rhine and the Danube, where they settled, the Roman army and colonists having retired beyond these two rivers. They called themselves Alemanni. In the beginning of the fifth century the Alemanni divided the country on the left bank of the Rhine, as well as part of Northium, Vindelica, and Helvetia, and founded the kingdom of Alemannia. Clovis, king of the Franks, conquered the western part of the Alemanni and their estate oflippe in 496 on the frontier of their country. The Emperor Theodeoric, king of the Ostro-Gotha, was defeated by the Franks in 536. (Cassiodorus, Var., ii, 41.) The Franks lost a considerable part of their lands, almost all the others were deprived of their estates, many of them were killed, and a great part of the country was devastated for 613 and 624 the laws of the Alemanni were collected by order of the Frankish king Clotarius, under the name of Alemannorum. This collection is in Latin, like the laws of the other Teutonic nations of that period, except the laws of the Anglo-Saxons, which are written in their own language.

The Lex Alemannorum was revised in the time of Hugobert, king of the Franks, and again by Lambert, the Frankish duke of Alemannia, in the beginning of the sixth century, a correction being made in it in the "Legis Ripuariorum, Baiuvariorum, et Alamannorum," 1530, 8vo. Besides these collections, the Teutonic laws are in the collections of Hulden, Lindenburg, Euchard, Heinneuccius, Georgius, Canciani, and Belazius. During the Middle Ages, the Alemannians came from north-eastern Germany, and first assisted the Alemanni against the Romans; but they left Germany as early as the beginning of the fifth century, penetrated into Gascony, and formed the powerful kingdom of Burgundy, which was united with the kingdom of the Franks in 534. The collection of the Burgundian laws, Lex Burgundionum, "Gundobada," "Gundobada," "Loi Gombette," was made towards the end of the fifth century, under king Gundobald, who died in 546, and was augmented (517) by king Siegmund, who died in 523.

The legislation of Gundobald goes as far as title 49. The following titles, although they contain laws and regulations of Gundobald, were added by Siegmund, who completed the code by two "additamenta," containing his own laws. Charlemagne made a third "additamentum," without altering the code itself. The Lex Burgundionum, which is written in much purer Latin than most of the other Teutonic collections, was also one of the Roman law concerning donations, and especially testaments (tit. 43 and 60). A separate edition was published at Lyon in 1611.

Franks. [Frances.] In the very countries which the Romans traversed on their way to the woods where Varus was slain, the Ustetes, the Tenceter, the Sicambri, the Bructeri, the Ansaribari, the Marsi, the Tuilantes, the Chamavi, and the Chattii—all tribes belonging to the northern and now Saxon branch (Ingenaeones) of the Germans—formed a confederation, and called themselves Franks, either because they were particularly free and bold, or on account of their "barbed lance" (framceae). Their name Franks appears in 242, when some of them made an expedition into Gaul. They were in her diversity called Franks, by general, Aurelianus, defeated them. In the beginning of the fifth century they had conquered Belgium as far as the Somme, and in 497 their king Clovis put an end to the Roman power north of the Loire. The Franks subsequently conquered the country of the Bavarians, the Suevians, the Visigoths; Germany, and the Slavian countries as far as Poland; part of Pannonia; the Longobard kingdom in Italy; and Spain between the Ebro and the Tagus. These were the Frankish or Teutonic nations, except the Scandinavians, the Angles, Saxons in England, and the remainder of the Goths in the mountains of Asturias. The Frankish language, a dialect of the Low German, was spoken at the court of this emperor, and not only by the Franks themselves but also by the people of Germany the Franks settled among the Suevian tribes at the Middle Rhine and the Main, and the mixture of these languages is the origin of the present Middle German or
Franconian dialects. Among the Teutonic nations which settled in Roman provinces, the Franks were the last who were converted to the Christian religion: their king Clovis was baptized after the Alamanni at Zlips oder Zlips (Tolbiacum) in 496. The founded a mighty autocracy in France, the political influence of which was broken by Louis XI. The personal and social influence of the Franks lasted till the Revolution of 1790, which is justly deplored by the best modern French historians as the reaction of the subjugated Celtic people against haughty and insolent Frankish invaders.

The Franks were divided into Franci Salici, who lived in the Low Countries between the Zudder Zee, the Maas, and the Rhine, and invaded the Rhine valley as far as the Danube, and the Rhinogoths, who crossed the Rhine between Nymegen and Bonn. Each of them had their code. The Lex Salica was written in very barbarous Latin, under Clovis, between 481 and 496, and was never revised, although it contains some laws by the sons of Clovis, which begin with the 82nd (23rd) title. Except one rule in title 14, about the rape of free persons, and another concerning marriage within the prohibited degrees, this code contains no trace of the Roman law. It is very important in the history of the laws of the Teutonic nations. The antient Lex Salica is often confounded with the present Salic Law, which regulates the right of succession in several sovereign and noble families in Europe. But this latter Salic law is only a single rule, which was made in 1170, and occasioned by the tax-free estates of free or noble Franks (terna Salica), which belonged to the male issue, to the exclusion of females. It is contained in title 62, "De Aloe,' l. 6: 'De terra vero Salica nulli portio hereditatis mu
det se ad virum saxa terma hereditatis perniet.

The law was not peculiar to the Franci Salici: it occurs in the greater part of the other antient Teutonic laws. (Wards, Geschichte und Auslegung des Salischen Gesetzes; Henneuces, Ant. Germ., i., p. 265, 285; a separate edition of the Lex Salica was published by Pithou, Paris, 1822, 8vo.)

The Lex Ripuaria was collected by Theodoric, the son of Clovis, between 511 and 534. It was several times revised, especially by Dagobert. It resembles the Lex Salica, and contains no traces of the Roman law.

Goths.—While the Alamanni, the Burgundians, and the Franks invaded Roman Empire on the Danube and the Rhine, its eastern frontiers were attacked by the Goths. The Goths originally inhabited the countries on the Baltic between the Vistula and the Niemen; but as early as the fourth century a.d. they had passed on the shore of the Pontus Euxinus and the Maeotis, where they founded two great kingdoms,—that of the Ostro-Goths, or Greuthungi, east of the Donier, and that of the Visi-Goths, or Thervingi, west of it. Their position was broken by the Odoacer, who was subjugated, partly forced to retire in Dacia and in Moesia. The Visi-Goths then left the Danubian countries, traversed Italy as far as Reggio, opposite Sicily, and finally conquered the southern part of Gaul, and Spain. The Ostro-Goths, less fortunate in their attempt on Thrace, were forced to go back to Dacia, where they became subject to the Huns. After the death of Attila, in 453, they recovered their independence, and leaving the dangerous country, they wandered over the part of the western part of this country, which the emperor Zeno was obliged to cede to them in 474. In 488 their king Theodoric, after having besieged Zeno in Constantinople, compelled him to cede his claims on Italy, then under the dominion of Odoacer, the chief of the Rugi, the Heruli, and other tribes, who had put an end to the Roman empire in Italy by deposing the last emperor, Romulus Augustus, in 475. [THEODORIC.] Odoacer was deprived of his crown and his life by Theodoric in 493, who founded the kingdom of the Ostro-Goths in Italy, which lasted till 522, when Tejas, the last king, was de
dest and killed by Naraias.

The Code of the Ostro-Goths, "the Edictum Theodoricum," which was composed by order of Theodoric, has been preserved in a collection of Roman law books. This king wished to form one people of the Romans and the Goths (Edictum, § 30), and be therefore adopted the laws of the most civilized of his subjects. Leaving the Gothic laws exclusively to the

memory of the people, he knew that they would soon fall into oblivion without being formally abolished. In some cases, however, he supplanted Gothic customs by Roman laws. The Weghred, or Werhe,—that is, the fine for crimes,—was entirely abolished, and in place of it the punishment of death was introduced in many cases, an innovation which seemed very hard to the Goths, who, like all the other Teutonic nations, inflicted the punishment of death for high treason and for a few other crimes. Pithou published a separate edition of "Edictum Theodoric." (Paris, 1579.) Rhon, Commentatio ad Edictum Theodoricum, Reg. Ostrogot., halae, 1816, 4to.

The Visi-Goths settled in the southern part of Gaul in 412, and invaded Spain in 414. They took possession of the hands of the Suevi, the Alani, and the Vandals, who became subject to the Goths, or were forced to emigrate. In 451 the Visi-Goths, together with the Franks, defeated Attilla and his 700,000 Huns, Goths, Gepidae, and other vassals, in the plain of Chalons-sur-Marne. Their king, Alaric II., lost Gaul, except the eastern part of Langue
doc and Provence, in the battle of Vougle against Clovis; king of the Franks, in 507. The kingdom of the Visi-Goths lasted for three years, when it was overthrown by the Arabs in 712. [SPAIN.]

Among all the Teutonic nations the Visi-Goths were the first who had written laws. (Isidorus Hispalensis, 'Chron. ad annum Aen. Hisp., 504, a. d. 460.') A collection of their laws, called Lex Segestan, or instead Lex Salicae Visigotorum, was written in Latin and has the title of 'Lex Visigothorum.' Its present form dates from King Egica, whose new code was translated into the Gothic language under King Recesvindo. It contains many traces of the Roman law, and the only one that is considered as a code in the modern significance of the word. The Lex Visigothorum must not be confounded with the Brevisarium Alarici (Alaric II., in 506), or the Code for the Romans, who were subject to the Visi-Goths, and continued to live under their own laws until they were abol
dished by the kings Chindaswind and Recesvindo, who declared the revised Lex Visigothorum obligatory on all the inhabitants of the kingdom of the Visi-Goths.

The Goths, the first civilized among the Teutonic nations, were the first who adopted the Christian religion. They had a literature from the time when Ulpilias translated the Bible. The Visi-Goths were at first Arians, and though they returned to the Roman Church, they distin
guished themselves from the other Roman Catholics by their form of worship, or the Oecumenic, which was approved by the fourth Council of Toledo, a. d. 633. It is also called Officium Beati Isidori: Isidore presided over the council that composed this code of laws, which have been used in the Spanish church from the earliest times of Christianity. It was written in Latin, but in旧古典 character, which differ from the Scandi
navian runes.

The Ostro-Goths soon disappeared among the Longobards, while the Visi-Goths preserved their language and nationality till the invasion of the Arabs; and another portion of them maintained their nationality until a very recent period. These were the Gothi Tetraxiatae, who, after the emigration of their brethren to the western countries, retired to the eastern part of the Chersonesian Taurica, now the Crimea, and the opposite island of Taman. There they were joined for eleven centuries by many Huns, Bulgarians, Greeks, Khazars, Tartars of the Crimea, and, lastly, of Turks Osmanlis. Their part of the Crimea was called Gotlia during the middle ages. Susebeius, who was the ambas
dador of the emperor Rudolph II., at the Congress of Lemberg in 1610. Towards the end of the sixteenth century, is the last writer who mentions them. It appears that they afterwards adopted the language, the customs, and the religion of the Tartars, and have since become Tartars of the language.
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shows that this opinion is unfounded. (Olaus Verelius, Gothric et Roth Westrogothicae Regnum Historia, Upsalia, 1684; Antonius, Bibl. Hist. Vol., i. p. 62; Michael Geddes, Miscellanea Tironis, vol. iii. p. 525; Moscov, cited below, i. i., p. 533-568.)

Aistulf.

Suevi.—From the country east of the Black Forest, between the Upper Danube and the Alps, the Suevi, by whose manufactures and the Habitation of the valley, likewise meant, spread over Gaul and forced their way into Spain (406-409). Their king Hermanic or Hermanich became master of Portugal, Galicia, and the western parts of Asturias, and Leon; he resided at Bretonia, near the mouth of the Loire, and not in the little state of Freize. His successors were independent kings, but in 565 the Suevi became subjects of Leovigild, king of the Visigoths. Their laws have not been collected. They were at first Catholics, but king Remissmund (481) professed Ariarmian; Theodemir (Arianism) returned to the Catholic faith in 561.

Vandals.—This name, which was known to Tacitus, comprises various tribes of Teutonic and also of Slavonian origin, who lived in Eastern Europe and Pomerania. The Slavonian tribes were subject to the Teutonic Vandals, who are often confounded with the Wends (Venedi), who afterwards occupied the country of the Vandals. The Vandals left their homes towards the end of the fourth century, and a part of them, and the Burgundians, traversed Germany and Gaul, and founded the Vandal kingdom in Spain in 409. In 417 they subjugated the Alani, who had also settled in Spain. In 429 they were forced by the Visi-Goths to abandon this country, and they went over to Africa. Their king, Geiseric, who took Carthage, took the Vandals, and the islands of Sardinia, Corsica, the Baleares, and the western part of Sicily. On the 12th July, 455, they plundered Rome, and their name became proverbial as that of the most barbarous among the barbarians. Their kingdom lasted till 538, when it was destroyed by Belisarius, and became a part of the Byzantine empire. All the names of the Vandal kings are Teutonic, and resemble those of the Gothic kings, a fact which proves that however numerous the Slavonians were among them, the Teutonic tribes were the ruling nation. Their name is visible in that of the province of Andalusia or Vandalousia. (Papecordt. Geschichte der Vandalen.)

Longobards. [Lonbardey]—The Longobards lived on the right bank of the lower Elbe, and afterwards on the left side of this river, near Lüneburg and Brunswick: in language and person they resembled their neighbours the Saxons, a strong body of whom appeared with them in Italy, when invaded Italy, and lived in the present country of Upper Hungary, in Pannonia, and in Noricum (494-568). Their king Alboin subjugated the Gepidae in Transylvania (563?), and in 568 he conquered the greater part of Italy. Their last national king, Desiderius, son of his third wife, became co-king, and renounced his rulership, who assumed the title of king of the Longobards: but the Longobards neither lost their constitution nor their estates; the only change was in the reigning dynasty.

When the Longobards were subjugated by the Franks, they possessed written laws for 130 years. The first collection was made by King Rothar in 943. The laws of Grimold were collected in 688, those of Luitprand between 713 and 724; those of Rachis in 746, and those of Anzio in 757. They contain only four laws concerning prescription and succession. (Muratori, Script. Rer. Ital., tom. i. p. 2; and especially Biener, De Origine et Progressu Legum Jurisverum Germanicorum, i. 1, 160.)

These are the Teutonic nations that founded permanent kingdoms within the limits of the Roman empire. Except the Alemanni, they all came in contact with a population, the educated part of which was entirely Romanized, although, especially in the south of Spain and Gaul, the inhabitants of the villages, who were called the Berbers or Iberians, were for a long time subjugated by the Teutonic invaders. (Pauv. Hist. de la Gaule Meridionale, vol. i.) The political institutions of the new masters of the civilized world remained very little altered.

The Teutonic laws were not territorial, as they now are, but personal: a Frank was judged after the Frankish law, a Burgundian after the Burgundian, wherever he lived. This principle being applied also to the Romans, gave rise to a double legislation, one for the ruling Teutonic nation, and the other for the subject Romans. The second principle was that the sovereignty belonged to the body of the conquerors, and not to the individual conqueror, as to a king. The sovereignty not only comprised the supreme authority in legislation and administration, but it was considered as comprehending a right to the private landed property of the vanquished nation. Every free Frank or Goth became the master of the estate on which he had landed; whether he was a subject of the kings from the Romans. The rights and duties of the kings towards their Teutonic fellow-conquerors remained the same as before; the kings had no right to purchase any freeman, unless in time of war and for neglect of military duty, and even in such case they were not entitled to serve in any way to which they had not given their consent; and they did not pay any taxes to their kings, who were only the first among their equals. As to the subject Romans, the Teutonic kings became the lords of a numerous civilized nation: as successors to the rights of the Roman emperors, and with regard to the Romans, they had absolute power, and they became proprietors of the external private estates of the emperors. They maintained the provincial administration. As a second part, the Romans filled the place of the Great and his successors, but they often conferred various functions on one person in order to render that complicated administration more easy to manage. As the conquerors lived among the subject people, each province had a double administration, for the Teutonic and the other for the subject nation. But there resulted as much confusion from this circumstance, that the kings were obliged, especially in Gaul, to sacrifice the principles of the Roman administration, and to govern in the Teutonic way, and in particular, all the men of the Teutonic nation, they were Roman. The first functionary in each province in the Frankish kingdom was the Duke, who had the supreme military command, and sometimes also the authority of a civil governor. The second was the chief judge and director of all affairs concerning taxes and of the fiscus. From the eighth century the functions of the Dux and the Comes were conferred upon one person, who is sometimes styled Dux, and sometimes Comes.

The fate of the Romans in the Frankish empire was threefold. One part of the Romans entered into the private service of the king, and preserved a portion of their estates on condition of obedience to him. The great landowners belonged to this class, which had the name of Roman Chinese, &c. A second part, the Roman possessed, remained in possession of their lands, but they were obliged to pay taxes for them, a duty from which the conquerors were exempt: this class principally consisted of the burghers. The third class were the Romans tributaries, who lost their liberty, but became Serve in the Roman sense of the word: these were the ancient coloni. In many towns the Romans continued to enjoy their municipal institutions, while a Roman noble was chosen as the representative of the community, and had its separate constitution. In other cities, the richest among the Romans lost their liberty and became ministarles, a kind of privileged vassals: but the poor were treated as the Roman tributaries in the villages.

The Teutonic nations which became subject to the Frankish kings were treated with less severity. The Burgundians, the Longobards, and the Bavarians only changed their dynasty, but the greater part of the Thuringians and of the Alemanni lost a considerable portion of their lands, and were reduced to the condition of a freedman, to be given to Frankish nobles, or whom they became vassals.

Besides those nations which founded permanent kingdoms within the Roman empire, many tribes maintained their independence there only for a short period, or came and went rapidly without leaving further traces, or were subjugated by others, and adopted the names of their conquerors. Many among them were of Slavonian or other origin.

The Alani came from the Caucasus, traversed Europe, and lived independent in southern Spain under their King Respendial, from 409 to 417, when they were subjugated by the Visi-Goths and carried into the south of Gaul. Another part of them settled between Orléans and Tours, under their chief Esila, being defeated and dispersed by the Visi-Goths. The Alani were not of Teutonic origin; the names of their kings (Respendial, Utaceo, Goz) have no resemblance to
Charlemagne was the first king of the Saxons, who formed a great confederation of free communities; they appointed dukes for their wars, and only acknowledged obedience to the 'growing' and to 'govern' and the freemen among the 'edelings' of the communities.

The laws of the Saxons were collected by order of Charlemagne. They consist of nineteen titles, and are so short and incomplete as to justify the view that part of them has been preserved. Two 'Capitularia' of Charlemagne concern the political and ecclesiastical condition of those parts of Saxony which were conquered at the time of their publication, 788 and 797. This 'Lex Saxonum' was not compiled, but was perhaps the result of the establishment of certain forms of the code of Saxon law which was written in Latin and afterwards translated into the Saxon language by Ecke van Regov, between 1215 and 1218. (Gaertner, Saxonum Leges Tres. Accessit Lex Frisionum, 1704.)

Fririans [Friarins].—The Fririans were brought under the Roman power by Drusus, the brother of the emperor Tiberius. Oennius, their governor in A.D. 29, oppressed the nation by fiscal measures and finally cast off the Roman yoke. In the war between the Romans and Claudius Civilis they joined the latter. When the Franks invaded Gaul, the Frisians occupied some countries which were abandoned by the Franks, the islands between the mouths of the Scheldt and the Eider, and the Frisian coast from Gelderan, Zutphen, and Overyssel; and after the emigration of the Anglo-Saxons they gradually took possession of the coast and the islands of the German Ocean as far as Jutland. In 869 they were attacked by the Franks and obliged to pay them tributes and meet with governors of the Saxones et &c., 1793-8.)

The Thuringians occupied the country north of the Saxons as far as the Unstrut, and even beyond that river. They were related to the Goths, and their name seems to resemble that of the Thervingi, the Heruleni, and Herulfri, the chief of the Herulonen or Wirtenorum. Their name is said to have been 'Wettenor,' 'Wirtinorum,' 'Wirtinorum.' These Angles and Warini or Werini were settled in the northern part of Thuringia, but it does not appear why their names are mentioned before that of the Thuringians, who were the more numerous nation. This collection is brief and incomplete. (Leibnitz, Script. Rer. Brunsvici, i., p. 61.)

The Saxons [Saxonen; Saxony] dwelt north of the Thuringians. On the east their frontiers were the Elbe, the Siecknitz, and the Baltic; on the north, Denmark and Schleswig; on the west, the Uckermark and the Havel; on the south, they corresponded to the western frontiers of the present province of Westphalia. When they had sent numerous settlers to Britain, their power became less formidable, and their rights were transferred to the east. The Saxons, like the Franks in the west, had formerly united with them against the Romans, but when they had conquered Gaul, the Saxons were obliged to desert from their incursions into this country, and hence arose jealousy and hostility. The south-western parts were conquered by the Franks as early as 595; the rich landowners were compelled to give a considerable part of their lands to Frankish nobles, and the common freemen to bend under the yoke of servitude. The remaining and greater part of the Saxons was devastated; they were subjected to tribute, and, after the memorable battle with Duke Wittekind (772-803), Charlemagne mastered all of Saxony. But the Saxons were not subjected like the Romans. They promised to adopt Christianity, to acknowledge Charles as their king, and to obey his governors (greves) and bishops. On the other hand, Charles granted them equal 'Wehre' (value of their body and liberty in case of wounds, murder, &c.), and the Saxons, who came from free, and, consequently, from tribute, and the privilege of being tried in their own country, according to their own laws, and by their equals.

Saxonen patris et libertatis honore
Hoc est postea sechst foliis Francia,
Unsus deinde Saxonia ad Saxones
Anonym., in Leibnitz, Script. Rer. Brunsv., i. p. 153. Compare Mäser, Ombrätscharische Geschichte, i. 3-40, the best work which has been published about the old Saxons in Germany.

The following works contain full information concerning the history of the Teutonic nations:—Mascov, The History of the Antient Germans, translated by Thomas Lediard; Gibbon, Decline and Fall; Eichhorn, Deutsche Staats- und Rechts-Geschichte; Savigny, Geschichte des Römischen Recht in Mittelalter; Grimm, Deutsche Rechts- Alterthümer, and his Deutsche Grammatik.

The Scandinavian branch of the Teutonic nations appears late in history. The Sagas tell us that in the fifth century A.D. Odin led the Scandinavians to Sweden and Norway; but this Odin is a god. Less fabulous is the history of a second Odin, who, in the beginning of our era, led the Scandian and Swedes far beyond the Scania and Sweden, which name gradually lost its present general meaning. Goths came to Scandia at a very early period, and the second Odin was perhaps their chief. They mixed with the Scandinavians, and traces of their language have been found in the dialects of the provinces of East and West Gothland in Sweden, and

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their names is still preserved in many localities. The aborigines of Sweden and Norway belonged to the Finnish race.

They fled towards the north, but not without leaving their traces in the mountains of the Skånet and the Dovre Fjeld.

The Scandinavians, Northmen, or Normans, became known to the southern nations by their pirates, and they were often leagued with the Saxons. In the wars between Charlemagne and Wittenkind, the Danes assisted Wittenkind, who had married Gertrude, daughter of the King Siegfried. As early as the beginning of the eighth century the Danes and Jutes appeared in the north of England; in the beginning of the ninth century the Danes settled on the south-east coast of England. Normans or Norwegian traders settled in the Orkneys before the end of the ninth century: in 861 they came to the Faro Islands, and they sent colonies to Iceland as early as 870. The northern parts of North America were known to these bold navigators four centuries before the time of Columbus. Other Normans conquered Normandy, Apulia, Sicily, and the opposite coast of Africa. From the eighth century the Waregians, who came from Norway and Sweden, penetrated into Russia and founded the Norman dynasty of the grand-dukes of Kiev. The first families of the Russian nobility are of Norman origin.

The Swedes conquered the coast of Finland as early as 850, and settled in great numbers in the districts of Åbo and Nyland. Although Finland is chiefly inhabited by a nation of Finnic stock, and thus becomes a Russian province, the Swedish language is the only language used for public acts and legal documents. [SCANDINAVIAN LANGUAGE]

Such one of the best authorities for the critical history of the Scandinavians. He has written in Danish on the origin of the Scandinavians, on their mythology, a critical history of Denmark, a history of Denmark, and several other works concerning this country.

(Müller, in his Kritischen Examen der Dänischen und Norwegischen Gesanggeschichte, examines the historical truth of the Sagas; Peringskjold, Monumenta Sues-Gothica, Stockholm, 1710, fol.; Peringskjold, Wilkinsa Saga, sive Historia Wilkinesium, contains an account of the exploits and conquests of the Danes of this nation, in Sax, Scand, and Teutonic.

Table of the modern Teutonic Languages and their Dialects.

I. HIGH GERMAN LANGUAGES.

(The German language as it is written or spoken by the well-educated Germans, belongs to the High German languages, but is not a dialect.)

a. Suabian branch.

b. Allemannisch, commonly called as the south-west corner of the Black Forest.

c. Dialects of Switzerland, that is, of Bern, of the Oberland of Bern, of Wallis, of the country of the Grisons, etc., or Appenzell, &c.

d. Dialects of Elsace (Alsace) and of Baden.

e. Old Thüringian, subordinate branch, containing the dialects of the Thüringer Wald, of part of the Fichtelgebirge, and of the northern part of the Black Forest.

f. Old Thüringian dialects, or the Black Forest, of the Neckar, and of the country between the Danube and the Lech.

II. SAXON LANGUAGES.

a. Frisian branch, which contains the dialects of West Frisland, of Saterland, of the islands along the Dutch and the German coast, and of the islands along the coast of Slesvig.

b. Low German branch, divided into six sectional.

1. Of the language of the districts containing the dialects of Slesvig, of Holstein, of Hamburg, of Bremen, of Brunswick, of Hanover, of the country between the Harz and the Weser, and of the Marshes with East Frisia.

2. Of the dialects of Denmark, Holstein, Lower Münsterland, of Lower Münsterland, of Östen, of Osnabrück, of the Upper Weser, of Sauerland, of Mark, and of Eastern Berg.

3. Of the Lesser Rhine between Nieuwed and Dinsdacht, especially the dialects of the Eich, of Coldagre, and of Aix-la-Chapelle.

4. Of the Netherlands, containing the Dutch language, the Flemish language, and the dialects of Jâcle, of Cleve, and of Geldern in Germany.

5. The dialect of the Saxony-Thuringen.

6. Of the ancient Wendish countries, colonized by the Saxons, containing the dialects of Mecklenburg, of Pomerania, of Brandenburg, of the Marks, and of East Prussia.

C. ENGLISH BRANCH. [SAXONS; ENGLAND.]

III. SCANDINAVIAN LANGUAGES.

A. Old Norman branch, containing the dialects of the mountaineers of Norway, the Icelandic language, and some of the islands near the Faro Islands.

B. Danish branch, containing the Danish language, with the dialects of the islands of Jutland, and of Northern Sleswig, and the modern Norwegian language.

C. Swedish branch, containing the Swedish language, with the dialects of Gotland, of Dalarnia, of Stockholm and the adjacent country of Finland, and of the Azbuk islands.

(Adelung und Vater, Mythidritis; Balbi, Atlas Ethnographie; Ober-Müller, Atlas Ethnographie; Norden, Atlas Ethnographie, 1841.)

TEVÉRONE. [PAPAL STATES.]

TEVIOTDALE. [ROXBURGHSHIRE.]

TEWESBURY, an ancient market-town and municipal and parliamentary borough in the north-western part of Gloucestershire, close to the borders of Worcestershire, 9 miles from Gloucester and 103 from London. It is situate on the eastern bank of the Avon, near its junction with the Severn; and the small rivers Carron and Swillgate, the latter entering the river, and the former emptying its waters into the Avon, are both tributaries of the Severn. The immediate neighbourhood of the town is subject to floods. Within half a mile of the town is a handsome iron bridge of one arch, 172 feet span, over the Severn; and there is an ancient bridge of several arches over the river, which is entirely covered by a handsome, broad, and commodious bridge, crossed by a stone bridge, and the Swilgate by two. The parish extend about 4 miles from north to south, and its width ranges from 200 yards in the northern part, to 2 miles, its extreme breadth. Immediately to the north of the town is the whole width of the parish is only half a mile. Here the Avon has been diverted by an artificial cutting called New Avon, or Mill Avon. The parish contains 1,748 acres, and is bounded southwards by the small streams of Brook, in the southern part of the parish and that of Mythe in the northern part. It is a borough by prescription: it received its charter of incorporation from Queen Elizabeth in 1574. By the charter of William III., granted in 1696, the jurisdiction of the borough magnates was extended to the whole of the parish. It has returned two members to parliament since the 7 James I. Before the passing of the Reform Act, parts of the town, particularly on the eastward, were not comprised within the limits of the parliamentary borough, but the whole parish is now included, in the order of voting was formerly in the freemen and burgage holders, and inhabitants paying scot and lot.

The number of electors on the parliamentary register in 1840 was 402; including 69 who possess double qualifications; and of the former, 238 were occupiers of houses rated at 10s. and upwards. The town is not divided into municipal wards. The corporate body consists of a mayor, four aldermen, and twelve councillors.
TEWKESBURY

was composed of a high-steward, twenty-four principal
burgesses, including in that number two bailiffs and the
recorder; and they were assisted by the public prosecutor,
and four justices for the borough. The appointment
of twenty-four assistant burgesses was directed by the
governing charter of William III., but none had been
elected for many years prior to the Union, and plural
holding of the offices was declared by the Reform
Act. The twenty-four burgesses were elected by the
bailiffs and burgesses out of the burgesses at large.
The annual income of the old corporation did not exceed £220,
and in 1829 it was in debt to the amount of £24,166. The
corporation's property consisted of a small theatre, and the
property of the corporation conveyed to him, on which
the creditors were paid 6s. 8d. in the pound. Quarter-
sessions for the borough are held, and there is a court
for the recovery of debts under £50.

Tewkesbury is said to be of Saxon origin, and to derive
its name from Thet, a Saxon, who founded an hermitage
here in the seventh century. Early in the eighth century
two brothers, dukes of Mercia, founded a monastery, which,
in the tenth century, became a cell to Cranbourne Abbey
in Dorsetshire. In the twelfth century Robert FitzHaimon
enlarged the buildings and liberally endowed the institu-
tion, in consequence of which the monks of Cranbourne
made Tewkesbury the chief seat of their establishment.
At the Dissolution the monastic portion of its endowment
and its annual revenue was 1595l. A great battle was
fought on the 14th of May, 1471, within half a mile of
Tewkesbury, where the Lancastrians sustained a most dis-
astrous defeat, and both Queen Margaret and her son Prince
Edward were taken prisoners. The town suffered but
the property of the corporation, to the amount of the
military and civil defence, and the town was burned by
rebels in 1644, and was finally burnt and burned by
the latter, and held until the close of the war.
The town principal streets are narrow and walled
between a number of smaller ones branching from them.
According to the census of 1831, the population amounted
to 5790. The principal manufacture is the cotton and
lamb's-wool woolen industry. In 1810 the number of stock-
ing and weaving plots, in 1833 there were 409, and
the wages averaged 12s. in the former year, and 17s.
in the latter. The number of men, aged 20 and upwards,
employed in the stocking manufacture in 1831 was 300 (Pop.
Returns), and 44 were engaged in the lace manufacture.
Nail-making formerly employed a considerable number,
but in 1833 there were only 50 persons so occupied. (Man.
Corp. Reports.) Tewkesbury is and is still the centre
of an extensive carrying-trade on the Severn and Avon;
but the improvement of the navigation, and the means
of a canal, is said to have been injurious to Tewkesbury,
and to the improved means of intercourse with other towns in
the same district is also ascribed some decline in the attendance
at the corn-market. The town is traversed by two
principal roads, one from Hereford to Gloucester, and
connection with Hereford and Wales, counterbalances on
the other hand the effects of the above-mentioned im-
provements. There is a branch railway from Tewkesbury
rather more than two miles in length, which joins the Big
ningham and Gloucester Railway. The collegiate church
of the ancient monastery is now the parish church. It is
noble and venerable structure, in the early Norman style,
and consists of a nave, choir, and transepts, with a tower
rising from the centre, supported on massive and lofty
piers. The roof is finely groined and carved. There
are several ancient chantry chapels in the east end
of the choir, which is hexagonal. Some of the monuments
are in memory of persons who fell at the battle of Tewkes-
bury. The annual income of the houses was about 70£.
A new church was opened in 1837. All the principal
monastic buildings and houses are now in course of
conversion into dwellings, schools, and so forth. The
parish church is richly decorated with monuments and
memorial tablets. There are almshouses for 10 men
persons, and several medical and other charities of

TEXAS

was, since the publication of the article on Mexico
(MEXICAN STATES, THE UNITED STATES, THE)
which, with the exception of the island of Texas,
was then merely an insurgent province of that republic,
has been recognised as an independent state by the leading
powers of Europe and America. A succinct statement of
the revolution by which this change has been effected is
necessary.

A decree of the Constituent Cortes of Mexico, dated 7th
May, 1821, declares that Texas shall be annexed to Col-
hua until it possess the elements necessary to the forma-
tion of a separate state; but that as soon as it shall possess
these elements, the connection is to be dissolved, and a
separate state constitution given to Texas.

At the time when the decree was pronounced, Texas proba-
bly did not contain 4000 inhabitants of the European race.
The district of Bexar, which in 1806 contained 6400 colonists from Mexico, was found in 1833 to contain
only 3400 of that class, scattered over the settlement of
San Antonio, the missions, and frontier military stations.

The government of Mexico had made efforts, both while
the country was a Spanish colony, and after the recogni-
tion of its independence, to promote the settlement of Texas
by the Emperors system of colonization, i.e. by granting
tracts of land to individuals, who were to settle on the
land, and unless they settled a specific number of colonists on
them within a limited period. In furtherance of this policy,
permission was given by the supreme government of the
Mexican States of the reduction of missions on the
frontier of Texas, in 1821, to Moses Austin, by birth a citizen of the United
States, to introduce into Texas from Louisiana 300 families,
believing the Colhuas, or agreeing to become so on entering
the Spanish territory, and also agreeing to take the oath
of allegiance to the United States of America; and, for
the vicinity of the Bexar river was granted them to settle
upon. Some difficulties arose from the disturbed political
state of Mexico at that time; but in 1824 colonizing op-
portunities were begun by 50th lay between the frontiers
of Coahuila and San Antonio. Under these grants the
granting of lots from the United States proceeds with such rapidity, that in 1835
Colonel Almonte, a commissioner of the Mexican govern-
ment, reported the population of the province to be as
follows:—In Bexar, 4000 inhabitants of European origin,
of whom 9400 were Spanish MEXICANS and 600 Irish
settlers; in Bexar district, 2000 negroes, almost exclusively colonists from the United States; in
San Antonio, 9000, of whom 1000 were negroes, almost
Anglo-American colonists. In addition to these, Texas con-
tained about 15,000 Indians, of whom 4000 were friendly
Indians, and 11,000 of the hostile Indians, 677 white
and 588 negroes. The Mexican commissioner remarked in his report that the
part of Texas which presented the greatest difficulties to
colonization was that lying between the frontiers
of Coahuila and San Antonio. The province was
isolated from the rest of the Mexican provinces, and had an easy communication with New Orleans. The balance of commercial enterprise and wealth was also in favour of the two districts which lay nearest to the United States, and had been colonised from them. The whole trade of Texas in 1834 he valued at 1,400,000 dollars, of which 600,000 belonged to Brazos, 470,000 to Nacogdoches, 270,000 were invested in the smuggling trade of these two districts, and only 60,000 belonged to the Spanish Mexican enemy.

Various incidents had occurred between 1824 and 1835 to excite repulsion and distrust between the Anglo-American colonists on the one hand, and the settlers of Spanish descent and the Mexican government on the other. One of the most odious to the community of the empresario grants that schools for teaching the Spanish language should be erected in all the new settlements. This had been entirely neglected. The wealthier settlers of Brazos and Nacogdoches sent their children to be educated at New Orleans, and the poorer gave their no education at all. The system of settling some hundreds of families of the new comers in the same neighbourhood, subject to a certain degree of control from the empresario, favors in order to prevent the gradual amalgamation with the Spaniards. They continued thoroughly English in their language and customs. Religion too became a means of increasing the mutual repulsion: the new-comers had no objection to call themselves Roman Catholics, but they were lax in the observance of fasting and disturbance of the priests and brought the Spanish settlers to regard them as persons of indifferent character. On the other hand, the settlers from the United States were chafed by the stringent custom-house regulations and some measures of his government. The question of negro slavery, too, added to their sources of discontent. By the fifteenth article of the treaty of amity and commerce between Great Britain and Mexico, the government of the latter was required to prevent all its subjects from taking part in the external slave-trade. The rule was relaxed in favour of the colonists from the United States, so as to allow their bringing their slaves with them; but the restrictions under which this permission was granted occasioned constant collisions and the breaking of the conditions of the customs. The decree of 29th September, 1829, abolishing slavery throughout the Mexican dominions, occasioned great discontent in Texas.

The government viewed the increasing numbers and wealth of the Anglo-American colonists with jealousy, partly on account of their democratic propensities, partly on account of its suspicion that the government of the United States was bent upon acquiring Texas. The San Antonio massacre long before this came in a great measure mere instruments of the federal and centralising factions; and Poinsett, the American envoy at Mexico, had not only been instrumental in founding the New York lodge, but had persisted in taking a part in the internal political contests and intrigues of Mexico, which was quite inconsistent with his diplomatic character, and ultimately led the Mexican cabinet to insist upon his removal. The Escoces, the party attached to a centralised system of government, were then in the ascendant, and they not unusually regarded every American from the United States as a Forjano, a democrat or adherent of a constitution which left each individual state more independent of the central authorities in Mexico. The settlers were seen to have little concern with politics. When Heyden Edwards and his confederates made their mad attempt to establish an independent republic in Nacogdoches in 1825, Stephen Austin and his colonists rendered prompt and efficient assistance to the Mexican authorities. But on another occasion they were viewed with the same suspicion as the rest of their countrymen.

The opinion that the United States were anxious to acquire the country to their territory had more appearance of foundation. Aaron Burr's Project of Spanish America in 1805 had not been forgotten. In 1825 the envoy of the United States at Mexico had been instructed to sound the government on the question of transferring the cession of New Mexico to the United States or republies from theSabine to the Rio Grande or the Colorado. In 1826 he had been authorised to offer the Mexican government a million of dollars for the frontier of the Rio Grande, and half that sum for the frontier of the Colorado. In 1830 he received directions to increase his offer to five millions for the frontier of the Colorado. This pertinacity on the part of the government of the United States naturally led the Mexican government to view with apprehension the growing strength of the Anglo-American settlers in Texas.

In 1830 the irritation on both sides was evidently bringing about a crisis. The military post of the frontier had been strengthened, new posts were established in the settled districts and at the trading stations on the coast. The number of Mexican soldiers in Texas was increased to about 1800, and placed under the command of the civil chief. The British minister was induced to support the invasion being intrusted with the supreme command. On the 6th of April, 1830, Bustamente promulgated a decree prohibiting all citizens of countries adjoining the Mexican territories to settle as colonists in the territories of the republic immediately adjacent to these possessions. By this decree the newly arrived settlers from the United States in Texas and those who were on their way were subjected to serious inconvenience and loss. On the remonstrance of Colonel Austin, the enforcement of the decree was mitigated. Henceforth they were to be permitted to take possession of their lands, but they received legal titles in only two of the seventeen settlements which were already established in Texas.

After the government had thus unsettled the property of the wealthy portion of the population, a revolution was inevitable; but as is generally the case, the first hostile collision between the citizens and the government forces was occasioned by one of the minor incidents of the revolution. It is well known that Anahuac was held by the American colonists, and the Governor of the town resolved to arrest an Anglo-American colonist arrayed the military and the settlers of Nacogdoches in arms against each other in June, 1832. The insurgents besieged and captured the post at Velasco, intercepted the political papers and threw them with great glee into the fire. The Governor of the town on a false pretext supposed by the government, had on the first intelligence of disturbances in Texas dispatched Colonel Mexia with 400 soldiers to that province, who was accompanied by Stephen Austin, representative of Texas in the Mexican legislature. Mexia was allowed to take possession of Nacogdoches, which by the terms of the arrangements of the 1st of August gave of their proceedings; and tranquility being restored, the whole of Texas declared for the plan of Vera Cruz.

In January, 1832, a convention assembled at San Felipe de Austin to frame a memorial to the Central Government for the separation of Texas from Coahuila and for the repeal of the law of 1830 which suspended the contracts of emigration. In 1833 another convention met at the same place, to consider the question of the annexation of Coahuila and the approval of the Central Government. Colonel Austin was appointed commissioner for the province to present and support those memorials. At Mexico he found everything in confusion; and on the 2nd of October he wrote to his constituents, advising them to organize an insurrection. The contents of this letter having come to the knowledge of Gomez Paris, the president, Austin was arrested on the 10th of December on his way home, and carried back to Mexico, where he was thrown into prison.
The appeal to arms was precipitated by a custom-house brawl. An attack was made under some pretext or another on the custom-house at Austin. Captain Thompson, dispatched by the Central Government, in June, 1835, at the request of the Ayuntamiento of that place, in the Correo war-ship, to inquire into the affair, precipitately attacked and captured a Texan trading-vessel. The prosecution of this was renewed on the Correo, and sent the captain to New Orleans under a charge of piratically interrupting the trade between the United States and Texas. In the month of August Santa Anna delivered the members of the Federal party, who had been his friend and supporter while he remained faithful to the plan of Vera Cruz, but latterly his enemy. The request was refused, and reports soon after reached Texas that Santa Anna was mustering troops to invade the State.

While affairs were in this position, Stephen Austin was entertained at a public dinner in Brazoria, on his return from his long captivity. Austin had, as long as he could, done his utmost to prevent the discontent of the settlers and was now successful, and when that was no longer possible, had steadily opposed any projects that seemed to point at a separation from Mexico. The advice therefore which he gave on this occasion, to organise committees of safety and vigilance throughout the States, was at once adopted. Captain Thompson was followed. He was himself appointed chairman of the committee of his own colony, to which a degree of control was given over the other committees, which he tactfully concealed. Before the assembling of these committees of safety began, which were commenced by the colonists and the military in the province in consequence of which Austin, in the beginning of October, assumed the command of an army hastily collected at Gonzales, and Zavala was appointed chairman.

On the 3rd of October, 1835, General Barragon issued a decree abolishing the legislative powers of the several states and establishing a central republic in Mexico. A general consultation of Texan delegates was, in consequence, called on. The 18th of November, issued a declaration in favor of state-rights; summoned a convention of delegates to be held at Washington in Galveston, on the 1st of February next; and organized an interim government. Henry Smith was chosen governor and W. B. Leon, lieutenant-governor; Samuel Houston was appointed major-general and command-in-chief of the regular army of Texas; and Stephen Austin, B. T. Archer, and W. H. Wharton were appointed commissioners. The convention met at Washington on the 1st of February, and on the 2nd of March it published a declaration of independence, signed by fifty delegates, of whom Lorenzo de Zavala was one. In the election of officers of state which immediately followed, Zavala was chosen vice-president.

Santa Anna marched from Saltillo on the same day that the convention met at Washington. He was successful in his first encounters, but on the 21st of April he was defeated and taken prisoner by General Houston. On the 14th of May he signed a convention for the evacuation of Texas, and soon after not a Mexican soldier remained in the state. The constitution adopted by the new state is a close imitation of the state government of the Northern Union; and, like its prototype, presents the anomaly of a slave existing under laws which profess to regard all men as equal.

The state was recognised as an independent republic by the government of the United States on the 3rd of March, 1837. A motion was made in congress for receiving it into the Union, but after some discussion withdrawn. France recognised the independence of Texas and concluded a treaty of commerce on the 28th of September. A treaty of amity and commerce between England and Texas was signed in London, on the 18th of November, 1840, and ratified by the Texan government in February, 1841. The Mexican government had expressed a determination to reconquer Texas; but it is not likely that in the distracted and impoverished state of that country it will be able to reduce a population which not only comes from land and sea, but also from better harbours and more shipping, in a position to receive constant support from the United States even against the will of the government at Washington, and on terms of alliance and amity with England, France, and the United States. Nor is it likely that it will be able to maintain itself on terms by re-annexed to Mexico: its Anglo-American population never could assimilate with the Spanish Mexicans.

In Texas, by William Kennedy, London, 1940; Colonel Almonte's Report on the Statistics of Texas, Mexico, 1835; Correspondence of the daily papers of London and Paris; Debates in the British Parliament, the Congress of the United States, and French Chamber of Deputies.)

Jose EXEIRA, or TEXTIRA, JOSEPH, was a well-known Jew at a good family in Portugal, about the beginning of 1543. After distinguishing himself at the University, he entered the order of St. Dominic in 1568, and obtained general respect for his learning and virtue. He was prior of the convent of the Santarem 1778, when King Sebastian undertook his expedition into Africa.

In the troubles which ensued, Texeira attached himself to the party of Don Antonio, and accompanied that prince to France in 1561, where he went to solicit assistance from Philip II. On the outbreaking of 1582, a compendium of the history of Portugal. The work is very scarce (it is described as a thin quarto of 70 pages), and appears to have been published for the instruction of the prince, who possessed the throne of Portugal. The author was taken prisoner, with other Spaniards in the naval battle off Terceira on the 26th of July, 1582, and carried to Lisbon, whence he contrived to make his escape and rejoin Don Antonio. Duarte Nonius Texeira, a convert to Judaism, employed by Philip II., to refute the 'Compendium of Portuguese History,' asserts that Texeira, while a prisoner at Lisbon, denied to him that he was the author.

The partisans of the League having obliged Don Antonio to quit Paris, Texeira accompanied him as his confessor, first to Bretagne, and in 1586 to England. In 1589, having returned to France, he was introduced to Henri III. and the queen-mother: the former appointed him a court chaplain; the latter dismissed him on a confidential mission to Lyon, then in the possession of the League, believing that a Dominican friar was unlikely to be suspected of being an agent of the court. Texeira remained at Lyon from July, 1588, to January, 1589. During the interval he published his first pamphlet, an attack upon his History by Nonius a Leon. This pamphlet, or some indiscreet expressions in conversation, having given umbrage to the Leaguers, he was obliged to fly; the papers left in his cell were seized, and the whole immolation of his pamphlet (with the exception of one or two copies) destroyed.

He rejoined Henri III. at Tours, and after the murder of that prince, in August, 1589, was continued in his office of court-chaplain by Henri IV., to whose service he attached himself. After the entry of Henri into Paris, Don Antonio was enabled to return to that city, and Texeira appears to have resumed his office of confessor. In March, 1593, he published a new edition of the work which had been destroyed at Lyon, but his labour was in vain, for he was called, in the August following, to perform the last service of his church to the prince whose cause he had advocated with such fidelity.

In 1590 Texeira was a witness of the public oblation of Calvinism by the dowager-princess of Condé at Rouen. The Papal legate selected him to instruct and confirm the princess in her new faith; and from that time till his death he continued attached to the service of the house of Condé. This employment left him time to authorise another and add an account of the public ceremonial of the princess's reconciliation with the Roman Catholic church.

In 1601 he published a narrative of the adventures of Don Sebastian, from his expedition into Africa in 1576, till the 6th of January of this present year 1601. We have
not been able to procure this work; but the following passage from Teixeira's 'Journal of the Reign of Henri IV.' throws some light upon the expression quoted from its title-page:— Friday, the 1st of June, 1601, comes the intelligence that the false or true Don Sebastian: (for as yet one knows not which to call him) has arrived at the galley which is the order of the viceroy of Naples.... The Portuguese maintain that he is the real Don Sebastian: they have solicited various courts to obtain his liberty, and published several works in his favour. Among others Joseph Teixeira, Don Sebastian's half-brother, wrote the 'Narratio de in a seven years in that country, and having made himself perfectly master of the language, devoted himself, by the advice of some able and enlightened Persians, to the study of Mirkond. [See the account of this historian in the previous number of this Journal.] He had first, as he himself has informed us that he was at Malacca, in the beginning of 1600, he embarked in the month of May for the Mirkond, and ultimately arrived at Lisbon on the 25th October, 1601. His correspondents in the East having failed to transmit to him some money which he had left in their charge, he was obliged to undertake a voyage to Goa to recover it. Disgusted with the sea, he resolved to return to Europe in a couple of years; he sailed from Goa, the 9th of February, 1604, and arrived at Basrah on the 6th of August (being detained some time at Ormuz), he travelled by way of Meshed-Ali to Bagdad, and thence to Anna, Aleppo, and Scanderdon, where he took ship for Europe. On his return to Paris, he made the tour of Italy, crossed the Alps into France, and then retired to Antwerp, where he spent his time in compiling a book, which he published in 1610. After that event we again lose sight of him entirely.

His work was translated into French, told by Antonio de Leon Pinelo, was composed in Portuguese, but translated into Spanish, and the rest written in that language with a view to publication, is entitled, 'Relacion de los Reys de Persia y Ormuz.' He died in 1612, and was buried in the church of St. Louis, at Paris, in 1626. Antonio says it was published in 4to; Antonio de Leon that it was published in 8vo. It consists of three parts: the first is a history of the kings of Persia, compiled by Mirkond with a brief continuation, done in the 4to; the second is an abridgment of the history of Ormuz, by Turan-shah, one of the kings of that district a work which appears to be known in Europe only from Teixeira's abstract), also with a continuation; the third, the historical part of his work in a low manner of little importance, but his voyage up the Persian Gulf, and his route from Basrah to Meshed-Ali, Bagdad, Anna, Aleppo, and Scanderdon, may still be studied with advantage.

Antonio and Leon Pinelo mention a book entitled 'Nagragia de los Reyes de Persia y Ormuz,' published at Lisbon in 1601, by a Peter Teixeira, but do not identify him with our author. A 'Certificacion de los Reyes de Persia y Ormuz,' published at Lisbon in 1601, by Peter Teixeira, is mentioned by Antonio as alive at Madrid in 1628. It seems to have been a work in a very short, but not of little importance, for it contains a map of Portugal and a description of the coast of Spain, neither of which appear to have been published.
TEXTVILLA. Mr. Swainson's name for a subgenus of Coccus-Ex. Coccus Amuralis. (Malacology.)

TEXTULA/RIA. [Foraminifera, vol. x, p. 348.]

TEZA or TAZA. [Marocco.]

TEZCUCO. [MEXICAN STATIST.] There is a Tezcuco, a more ambition of Tezcuco, a Dominican monk, who lived about the end of the fourteenth and the beginning of the sixteenth century. His name has been forgotten, but for the scandalous manner in which he carried on the traffic in indulgences, which roused the indignation of the better part of his contemporaries, and thus led to the reformation in Germany. He was a native of Leipzig, where he studied theology, and afterwards entered the order of the Dominicans in the Pauliner Kloster. In the year 1532 the pope appointed him preacher of indulgences for Germany. He remained till 1534, when he was engaged in the service ofadytery. But the interference of his superiors caused the sentence to be changed into imprisonment for life. He was accordingly conveyed to Leipzig, and confined in a tower which stood in that city near the Gimming- rath (Graimmingrath) until the year 1534, when it was pulled down. He had however not been imprisoned long before he was set at liberty at the request of Albert, archbishop of Mainz, and other ecclesiastical dignitaries, feel now made a pilgrimage to Rome, and acted the part of a penitent as well, that Pope Leo X, not only absolved him of his sins, but appointed him commissarius apostolicus in Germany, in addition to which the archbishop of Mainz made him inquisitor haereticae pravitis, because he had capacity of papal commendatory, in his traffic. He was therefore not more palpably than ever. He traversed Saxony in an open carriage, accompanied by attendants, and carrying with him two chests, one of which contained the indulgences, and the other the money raised for the purpose. The latter chest is said to have had the following inscription:

'Sobald das gold im kaden klingt, Sobald die wol gen haimm enting,' (For the alms of those who helped him, they sold their own clothes.

In reputation for sanctity had become so great, that in several places the population of towns met him in solemn procession, and his entry was accompanied with the ringing of church-bells.

Thus, murder, political adultery, and not only for crimes legally committed, but also for those which a person might commit. At last, in the year 1517, Luther openly opposed him, in the celebrated theses which he faxed on the church-door of Wittemberg. Tezel made a reply in another set of theses, which however were immediately burnt by the students in the market-place of Wittemberg. Tezel seems to have acted contrary to the intention of his superiors, and was therefore called to account by Karl von Miltitz, who was sent by the pope to settle the disputes which had arisen out of his conduct, reprimanded him severely. In the year 1518 however Tezel, notwithstanding all this, obtained the degree of Doctor of Divinity at Frankfurt on the Oder. After this event, he returned to Leipzig to his conven, where he died, in August, 1519, of the plague, shortly after the celebrated theological disputations of Eck and Karlstadt.

They were carried to the church of St. Thomas (the present university); but there is now no trace of his grave, as part of the church which contained his remains was pulled down in the seventeenth century to make room for some fortifications. [Lettner.] Compare F. Melanthonius, Historia Fidei M. Lutherti, i., p. 153, etc.; Gesserl, Lehrbuch der neuen Kirchengeschichte, vol. iii., p. 23; Löschner, Vollständige Reformations-Acta, ii., p. 324; and especially Hechelin, Vita Tezelii.

THAPAARUP, THE. Danish poet and dramatist, highly esteemed by his contemporaries as one of the classics in their literature, was the son of an ironmonger at Copenhagen. He was born 21st August, 1749, the very same day as Edward Storm, another poet. This coincidence could hardly deserve more notice, and the reason is, that if something so lous had not been founded upon it, it being said that Thaarup's mother dreamed that the wife of a clergyman at Gulbrandalsdel was delivered just at the same time of a son, who would be the rival of her own. If not true, both of them were born in the month of August, which has been with many nations, neither very numerous nor of very great extent, their productions, especially their lyric pieces, earned for them a reputation which does not always fall to the lot of writers of higher pretensions. It was more particularly the case with regard to Thaarup, whose three little musical dramas, 'Höstgildet,' 'Peter Bryllup,' and 'Himkomsten,' are esteemed chef-d'œuvre of their kind, and the songs and airs were known by heart by every one, and repeated all over Denmark. Their celebrity was not at all less than that of the 'Beggars Opera' in this country. After the death of Storm (SCANDINAVIAN LITERATURE, p. 3), Thaarup succeeded him as one of the directors of the theatre at Copenhagen, in which situation he remained till the end of his life. He was a full quarter of a century, Thaarup's literary life did not extend much beyond that of Storm. If he did not entirely lay aside his pen at the commencement of the pre-revolutionary period, he certainly remembered had appeared in the preceding one. He continued to reside at Copenhagen, where he died in the summer of 1821. Some of his hymns have been translated into German by Voss.

(Shilderie of Kriebsen, 1821; Neue Bibliothek der Schönenwissenschaften, vol. iv.)

THA' BET BEN KORRAH, an eminent physician, philosopher, and geometician, whose complete name, as given by Ibn Abi 'Osaimah in his Relationaleum de Classibus Medicorum, cap. 10, § 3, were Abû 'l-Hasan Thibêt Ben Korrâ. He was born at Harrân in Mesopotamia, a.d. 221 (A.D. 835-6), where he first carried on the business of a money-changer; he afterwards however went to Baghdad to pursue studies, which he carried on with much zeal, that he became one of the most celebrated literary and scientific men of his age. He belonged to the sect of the Sabians, but got entangled in some religious disputes, and was expelled from this consequence of this he left Harrân, where he had been residing for some time, and went to Baghdad with the celebrated astronomer Mohammed Ben Mûsa. There he lived in his house, and was introduced by him to Mo'tâdîd Pâshâ, sixteenth of that house, which he resided in. He lived in a very sunny place, and was named after it, A.D. 892-902, who appointed him one of his astrologers, and ever afterwards, on account of his acquirements and his pleasing manners, continued on terms of great intimacy with him. He died on the 26th of Safar, a.d. 296 (Februrary 18, A.D. 901; January 15, 902), aged 70. His fame spread through all the lands of the Persians, and was the cause of great commotions among the Persians, and was the cause of great commotions among the Persians, and was the cause of great commotions among the Persians, and was the cause of great commotions among the Persians, and was the cause of great commotions among the Persians, and was the cause of great commotions among the Persians, and was the cause of great commotions among the Per...
The Thalassinae

The genus Thalassina consists of three macrourid decapods which have four anterior feet terminated by two fingers, the foliaceous of the lateral fins of the end of the tail narrow and elate, without ridges; and the last segment of the tail or the intermediate piece, in the form of an elongate triangle. Sometimes the four anterior feet, or the two last feet, are terminated by four to six bristle-like fingers, forming a claw perfectly. The two anterior feet are the longest; the lateral foliations of the fin terminating the tail are in the form of a reversed triangle, or widest at the posterior border; the intermediate piece, on the contrary, ranges from the base to the termination, and ends in a point.

M. Milne Edwards arranges the family of Thalassinae, or Burrowing Macrura, between the Scyllaridae and the Astacidae.

The crustacea of which this small but interesting family are composed resemble each other in appearance, and are remarkable for the extreme elongation of their abdomen and the small degree of consistency of their integuments. Family Chaceonidae: Carapaces small, and very compressed laterally; terminal appendage very short, but sometimes entirely without one. Eyes ordinariy very small. Internal antennae terminated by two multi-articulate filaments; the external ones extended externally and a little below the first; their peduncle slender, cylindrical, and without a spiniform lamina, carried at most only one very small movable spine, which represents that appendage. Division of the parts of the mouth variable. Sternum nearly insert lateral, divided throughout its length into three sections; anterior feet large, more or less completely didactylous and triangular; the next pair raised on each side of the thorax. Abdomen very long, and, in general, very narrow, rather depressed vertically than compressed laterally; the second pair of appendages, which may be long, but little prolonged, and do not inclose the base of the feet as in the shrimps, nor does the abdomen itself diminish much in size towards its posterior part. The disposition of the respiratory apparatus varies also; sometimes it only exists, as it certainly does in the Decapods, as thoracic branchia, enclosed under the carapace in special cavities; sometimes, on the contrary, there are, besides those thoracic branchiae, secondary branchiae in the carapace itself, which may be long and filiform, or short and sidewise, without being united to the thorax. On this important difference.

M. Milne Edwards, who is the author of the character given above, founds his division of the family into two tribes, the Cryptobranchiidae and the Gastrobranchiidae.

1. Cryptobranchiidae

Under this group M. Milne Edwards arranges all the Thalassini which are without respiratory appendages suspended under the abdomen. Their branchiae are in general composed of a cylinder, extending through the branchiostegum and the shrimps of a brush. All the species whose habits are known live in the sand, in which they burrow deeply. The following genera belong to this tribe:—Glaucus; Caledonius; Aria; Gebra; and Thalassina.

2. Gastrobranchiidae

This tribe is distinguished from the previous ones by the absence of branchiae, and by the orifice of the respiratory tube opening behind the carapace and the thorax.

T H A

A beautiful and artfully inscribed stone table, which stood in the centre of a large and commodious apartment, at the end of which stood a bookcase, which contained the greatest number of books that could be found in any one place in the city.

The Thalassinae are a family of marine planktonic crustacea, belonging to the order Echinodermata. They are characterized by their elongated bodies, which are covered with a thin, transparent exoskeleton. The classification of the Thalassinae is based on the morphology and anatomy of their appendages, which are modified for burrowing into the sand. These crustaceans are widely distributed in the oceans, and play an important role in the marine ecosystem as grazers and detritus feeders.
bent (coudées), as in Pagurus; the third joint of their peduncle the longest, and carrying at its extremity two small multiarcticate appendages, which are very short and rather stout, one of which is furnished with many long hairs. _External antennæ_ inserted lower than the preceding, their peduncle bent, and presenting above a small scale, the vestige of a palp. _External jaw-feet_ pediform. The last thoracic ring not anchored to the preceding. _Anterior feet_ terminated by a stout, didactylos, well-formed hand: they are of very different sizes. Second and third pairs slender and very long: the two last pairs, on the contrary, short and elevated against the sides of the body, as in the Paguri; the fourth pair are flattened, rather large, and imperfectly didactylos, the immovable finger of their hand being only formed by a slightly projecting tubercle; the posterior feet, still smaller than the last, are terminated by a small didactylos rather well-formed hand. The _abdomen_ is narrow, elongated, and perfectly symmetrical: the first ring, much narrower than the succeeding ones, has no appendages; the four next segments, on the contrary, each give attachment to one pair of rather large false natatory feet, formed by a cylindrical basiliary joint and two terminal blades, one of which is very small and obtuse, and the other large, pointed at the end, and bordered with long ciliary hairs. _Caudal fin moderate_ in size; the middle blade, formed by the seventh abdominal segment, is rounded and ciliated, and the external blades are much longer than the middle ones. (M. E.)

M. Milne Edwards observes that this genus establishes the passage between the Pagurians and Callianassæ.

Example, _Glaucothoe pectin_; the only species known. Its integuments have little solidity, its carapace is smooth, and its length 8 lines. M. Milne Edwards states that it appears to inhabit the seas of Asia. He is of opinion that Latreille’s genus _Prophylax_ approximates closely to Glaucothoe, and ought not perhaps to be distinguished from it: if so Latreille’s name has the priority. The latter placed his genus among the Paguri, but after the publication of M. Milne Edwards’s _Glaucothoe_, was uncertain, according to M. Edwards, whether these two generic divisions should not be united.

_Callianassa._ (Leach.)

See the article: but the student should refer to the accurate and elaborate description and figures of M. Milne Edwards, who records two species:—_Callianassa subterranea_ and _uncinata_; and he adds that Callianassa major of Sars seems to be distinguished from the two preceding species.

Asia. (Leach.)

_Generic Character._—Carapace very much compressed, and terminated anteriorly by a small triangular rostrum. _Ocular peduncles_ very small, cylindrical, and terminated by a hemispherical cornea. Terminal filaments of the _internal antennæ_ nearly of the length of the carapace. Peduncle of the _external antennæ_ having above a small moveable spine which represents the great lamellar palp observable in the Shrimps. _External jaw-feet_ slender and pediform. _Anterior feet_ compressed, and terminated by a well-formed claw; carpus small. Second pair of foot nearly lamellar, and equally didactylos. The three next pairs monodactylous. _Abdomen_ slightly convex towards the middle, and terminating in a great fin, the five blades of which are nearly of the same length. First ring of the abdomen carrying a rudimentary pair of false feet, and the four succeeding rings provided each with a pair of very well-developed natatory false feet, each composed of a short and stout peduncle, which at its extremity carries a small styliform appendage large and, externally two great oval, very large blades, which are ciliated on the borders. (M. E.)

M. Milne Edwards observes that this genus much resembles Callianassa and _Gebia_, and he records the only known species, _Aria edwardsi_. Its length is about three inches, and it inhabits the coasts of France and England.

_Gebia._ (Gebios and Thalassina, Risso; _Gebia_ and _Upogebia_, Leach.)

_Generic Character._—Carapace terminating anteriorly by a triangular rostrum, and sufficiently large to cover the eyes almost entirely; on each side of its base is a tooth, which is continued with a crest, and forms the lateral border of the upper surface of the stomatal region. _Internal antennæ_ very short, but nevertheless their terminal filaments are longer than their peduncle. _External antennæ_ very slender, and presenting at their base no vestige of a moveable scale. _External jaw-feet_ pediform. _Anterior feet_ narrow, terminated by an elongated and imperfectly subcheliform hand: their moveable finger is very large, and in bending downwards its base is applied against the anterior border of the hand, the lower angle of which is prolonged so as to constitute a tooth performing the office of the immovable finger. The feet in succession are compressed and monodactyl; the second pair have their penultimate joint large, widened, and ciliated below; the succeeding pairs are more slender. _Abdomen_ long and much narrower at its base than towards its middle, depressed and terminating by a large fin, whose four lateral blades are foliaceous and very wide. First abdominal ring with two pairs of very small filiform appendages; the four next segments giving origin to three pairs of false natatory feet, composed of a stout and short peduncle, and two oval blades with strongly ciliated borders: the external one very large, and the other very small. _Branchiae_ brush-like and fixed on two rows, namely, one above the second foot, and two above the four anterior feet and the external jaw-feet. (M. E.)

Example, _Gebia stellata._ Length 1½ inch.

Locality.—Coasts of England. M. Milne Edwards states that this species comes very near to _Gebia littoralis._

M. Milne Edwards observes that the _Gebia_ establish the passage between the _Thalassinæ_ and the _Axier_, which last they resemble in the general form of the body and disposition of the caudal fin, whilst they approach the first by the conformation of the feet.
Thalassina. (Latreille.)

Generic Character.—Carapace short, narrow, and very much elevated. Somewhat region small and limited backwards by a deep furrow. Cardinal and intestinal regions equally separated from the branchial regions, and representing by their junction a triangle, the apex of which is directed backwards. Front armed with a small triangular rostrum. Eyes small and cylindrical. Internal antennae inserted above these organs; their peduncle of moderate size, and their terminal filaments slender and unequal, the longest about thrice the length of the peduncle. **External antennae** very small, their peduncle cylindrical, hardly reaching beyond the rostrum, and presenting above no vestige of appendages. **External jaw-feet** moderate and pediform, their second joint armed with spiniform teeth on its internal surface, and nearly of the same form as the succeeding ones. First pair of feet narrow and moderately elongated, but rather robust; they are unequal, and the hand which terminates them presents at its anterior and lower angle a more or less strong tooth, which represents an immovable finger, against which the base of the movable finger, which is very large, is bent back. Second pair of feet very much compressed, and rather wide; their penultimate joint especially is large and ciliated below. The succeeding feet have nearly the same form, but they are narrower, and less and less compressed. Abdomen very long, narrow, semicylindrical, and nearly of the same size throughout its length. Terminal fin small; the two pairs of lateral blades, formed by members of the sixth ring, nearly linear. False feet fixed to the four middle rings of the abdomen; they are very slender, and composed of a cylindrical and elongated peduncle carrying two more or less ciliated multarticulate filaments. (M. E.)

**Example.** Thalassina scorpionides. Length about six inches. Colour brownish.

division differ, he remarks, but very little from the first, and the conformation of their thoracic branches does not permit their separation from the macrurous decapods, nor their distinct removal from the Thalassinians; but they have respiratory appendages fixed to their abdominal false-feet, exhibiting the greatest analogy with the ramose branches of the Stomatopods.

The type of this group, according to M. Milne Edwards, is a small decapod crustacean, to which he gives the generic name Callianassides; but he also arranges in this same division the genus Iria of M. Guerin, under the name of Callianassa, for he thinks that he perceives in this last an analogical type of crustacean to the Thalassinians. It is signed to it by M. Milne Edwards that there has been some error of observation, and that in reality the Iria and Callianassidas differ from the Thalassinians.

These crustaceans, M. Milne Edwards observes, have all a very small oval thorax compressed laterally; their abdomen, on the contrary, is extremely long and slender. The disposition of the eyes and the antenna is nearly the same as in Callianassa. The external jaw-feet are pediform, and carry externally a slender and multarticulate pair. The two first pairs of feet are didactylous; the anterior pair is long, very unequal, and terminated by a stout compressed pedicellus; the second pair is small and very delicate; the third is enlarged towards the end, nearly to a spine, and is terminated by a very short tarsus, forming, with a tubercle of the preceding joint, an imperfect claw. The fourth pair of feet are slender and monodactyl; and the fifth pair, small, and composed of an imperfect claw terminated by a pair of slender and ciliated filaments. As a Cryptobranchus, the abdomen is very long, sufficiently so; and composed of nearly equal rings, of which the somatarch is not prolonged below so as to incase the base of the false feet. The caudal fin offers nothing remarkable; the false feet, inserted at its lower side of the median line for the reception of the base of the eyes, whose peduncles are very short, are formed as in the Callianassa. Four antennæ, slender extended, inserted nearly on the same transversal line; the first pair terminated by two filaments nearly equal in length, one of which however is the largest, and slightly convex to the end. Appendages of the mouth very small, occupying but little space; mandibles hardly differing from those of Callianassa; valvular appendage of the second pair very small; external jaw-feet slender and pediform, their second joint furnished internally with a row of cleanest tubercles covered with hairs, and with their three last joints very much elongated. Sternum linear throughout its extent. First pair of feet long, and one of them very stout with the terminating hand very large, and nearly of the same form as in Callianassa, except that the cusp is smaller. The two succeeding pairs of feet are small and flattened; the fourth pair nearly cylindrical, and their basaliy joint very much enlarged. Fifth pair nearly as large as the fourth, and terminating in an imperfect rudimentary claw. Abdomen composed as ordinarily of seven segments, nearly of the same size throughout, and carrying beneath five pairs of false-feet; of these the first are reduced to a simple row of slender blades slightly ciliated at the end, but the four succeeding pairs have a very remarkable conformation. A peduncle is to be distinguished and three terminal tarsi, two of which are very large and one very small on the edge of the preceding ones; all round the border of the abdomen there is a circular row of tufted fringes, and a row of cylinders, each of which gives origin to two small filaments, which again in their turn are bifurcated nearly in the same manner as the branchial filaments of the Squill are divided. The five blades of which the caryal...
In the Life of Thales Diogenes finds numerous traditions attached to his name, the value of which is somewhat difficult to estimate. Thales is enumerated among the Seven Wise Men, whose wisdom was not the theoretical wisdom of philosophers, but the wisdom of actual life. [Bias.] Accordingly we find that Thales took an active part in the political affairs of his native country. Before Ionia fell under the Persian yoke, he advised the Ionians to have a common council, and to establish a democracy at Teos, for Teos was in the centre of Ionia; and he further suggested that all the other Ionian states should be reduced to the condition of parts dependent on the government at Teos. Such a scheme, if carried into effect, might have checked the Persian and the progress of the Persian war. (Herod. i. 170.) Later writers say that he visited Egypt and Crete in order to improve his knowledge, and that he derived from Egypt his acquaintance with mathematics. If so, there seems no reason for thinking that Thales left any writings. Aristotle at least was not acquainted with any philosophical writings by Thales. Various sayings of Thales are recorded: they are of that sententious character which belongs to the proverb, and they embody truths such as the general experience of mankind recognizes: and for this reason they cannot be safely considered as the product of any one mind. Thales is generally considered the founder of the Ionia school; but it is perhaps hardly proper to consider him in any sense as the founder of a school. His tradition that the four elements were put upon his physical discoveries and his philosophical speculations. He is said to have been the first astronomer (among the Greeks) who predicted eclipses; and to have discovered the passage of the sun and moon to the tropic, or, in other words, to have laid down the sun's orbit, and to have fixed the length of the year at 365 days. He determined the magnitude of the sun to be 720 times that of the moon; which is apparently the true version of the report. His claim to the first discovery of the theory of the constellations seems to be derived from Egypt, and Pamphilus attributes to him the discovery of the right-angled triangle of the circle (προακομματον κειμενο το τριγωνον θροδεομα), which probably means the demonstration that the angle in a semi-circle is a right angle. He discovered the pyramidal form of the gorgon. Hieronymus says that he measured the height of the pyramids of Egypt by observing the shadow which an object cast when it was of the same length as the height of the object. The philosophical speculations of Thales, like the earliest efforts of philosophers in all countries, were an attempt to solve the problem that admits of no solution—the real nature of the universe. He is considered by modern philosophers as the oracle of the dynamics of nature, the nature of which, as opposed to the mechanical, is explained in the article IOHAN SCHOOL. Aristotle (Metaph. i. 3) has explained in a short passage the general doctrine of Thales: 'There must be,' observes Aristotle, 'some Nature of things, and if one thing has an origin, then all other things owe their origin to this one still subsisting. The number however and the character of such a first principle are not conceived by all in the same way. Thales, the founder of this philosophy, says it is water, and accordingly he taught that even the earth reposes on water, founding this notion probably on the observation that the nourishment of all things is moist, and that heat itself proceeds from water, and that animals live by it: but Thales from which this was the source of all things he was thus led to this notion, and also by observing that the seeds of all things have a moist nature, and that water is the origin of their nature to all moist things.' Thus the universe contained an active principle by the power of which all things were developed. He considered that the magnet had life, because it attracted iron. The universe then was pervaded by life, or, as Thales expressed it, 'full of gods' (παντα ειργα ευνια). The doctrine of Thales bears some resemblance to systems that have been promulgated in modern times, which have been viewed as atheistical. The assumption of an active power, such as gravitation for instance (though it is not here meant to affirm that gravitation is an actual effect of a will, or even a direct action of the mind on all things), which is sufficient to maintain all things in a permanent condition (changes such as we observe in limited portions of time and being only continued developments), may be viewed as an hypothesis...
made for the purpose of getting rid of the necessity of admitting the existence of God. Those who propound such an hypothesis, without further explanation, certainly do not take much pain to avoid the imposition of atheists.

It may not appear, however, that the doctrine of Thales was anything more than a pure physical theory; and the traditions recorded of him by Diogenes make him a believer in a Diety. The most ancient of things existing is God created; the most ancient of things created is the universe, for it is God's creation.'—It was one of the maxims of Thales, that death did not differ from life.

"Why don't you die then?" said an objector, more witty than wise. "Because there is no difference," was the reply.

THALLITES. [Episth.]
The basin of the Thames is occupied wholly by the secondary and tertiary geological formations. The sources of the river and the course of its upper waters are in the oolitic beds of the Cotswold hills. The valley through which the Thames itself flows from above Cricklade to Lechlade is a course of Oxford clay, and traverses the Cotswolds and the Chiltern Hills by a winding valley, in which it flows from Goring to Maidenhead, below which it enters the chalk basin of London, and has the remainder of its course through it. The affluents which join the Thames at Reading are chiefly in the oolitic district; the Thames and the Ock flow through the district occupied by the groups of the oolites and the chalk; and of the remaining affluents, those which join it on the north bank chiefly rise in the chalk hills, and have their course in the chalk basin of London; while most of those which join it on the south bank rise in the districts occupied by the subcretaceous formations, and enter the chalk basin of London by openings in the chalk unga of the North Downs. Owing to the entire absence of coal, the basin of the Thames has no manufactures except those of the metropolis; but it contains some of the richest agricultural districts in England.

Course and Affluents.—The spring which has commonly been regarded as the head of the Thames is about three miles south-west of Cirencester, near a bridge over the Thames and Severn canal which is called ‘Thameshead bridge;’ the true head of the Thames is about three or four miles south of Cheltenham. Two streams rise, one from fourteen springs at what is popularly called The Seven Wells, and the other from four springs near Ullen Farm, the westernmost of which springs is known as the head of the river: both streams rise on the south-eastern slope of the Cotswolds, and form by their junction, about a mile from their respective sources, the river Churn (a name the element of which is embodied both in the ancient and modern name of the town of Cirencester (the Continental form, or mans), by which it flows; and in the name of two villages, North and South Cern-ay, which are near it. At Cricklade, 19 or 20 miles south-east from its source, the Churn joins the commonly reputed Isis or Thames, the length of which above the junction is only about 10 or 11 miles.

From Cricklade the river flows 9 or 10 miles north-east to Lechlade, receiving on the way the Ray (11 miles long) and the Cole (14 miles long), both on the south side. Just above Cricklade it receives the Colne, a river which from its source on the Cotswold hills east of Cheltenham; and just below Lechlade it receives the Leach, or Leach (19 miles long), which also rises on the Cotswolds, and gives name to the towns of North Leach and Lechlade. From Lechlade the Thames flows 14 miles eastward to the junction of the Windrush, receiving accessions of small brooks on each side. The Windrush rises in the Cotswolds between Winchcombe and Campden, and is a course of 34 miles by Burford and Witney; it joins the Thames on the north bank. Below the junction of the Windrush the Thames makes a bend to the north and north-east, receiving on the north bank the Evenlode, which rises in the Cotswolds near Nethercot in the county of Oxford, and has a course of 36 miles, and a head of Thames; it receives the Glyme which flows through Woodstock and Blenheim park. The Thames then turns south, and flows to Oxford, where it joins the Cherwell. From the junction of the Windrush to that of the Cherwell the length of the Thames is 12 miles. The Cherwell rises in the Arbury hills near Daventry in Northamptonshire, and flows southward 44 miles by Banbury: it joins the Thames on the left bank.

From the junction of the Cherwell the Thames flows 16 miles south-east to the junction of the Thames at Dorchester, making however a considerable bend westward to Abingdon, where it receives the Ock. This river rises at the foot of the chalk hills of Berkshire, between Compton Beauchamp and South Stainet. It has a course of 26 miles, and a head of Thames, which it joins on the right or south-west bank; the Thames rises near Stewkley in Buckinghamshire, between Winslow and Leighton Buzzard, and flows 30 miles south-west by the town of Thame into the Thames, which it joins on the left or north-east bank. From Dorchester the course of the Thames is south-east 22 miles in a winding channel by Wallingford to the junction of the Kennet near Reading. The Kennet rises near Broad Hinton, a village to the north of Marlborough Downs, flows south to East Kennet, and then turning eastward flows by Marlborough, Hungerford, Newbury, and Reading into the Thames, which it joins on the right bank: its whole course is 53 miles. It receives the Lambourn and the Embourn or Auborn.

From the junction of the Kennet the Thames flows eastward, though in a very winding channel, making first a considerable circuit to the north by Henley, Great Marlow, and Maidenhead, and then to the south by Staines, Chertsey, Kingston, and Richmond to Brentford, from whence it proceeds by Hammersmith, Putney, and Chelsea to the metropolis. The distance from the junction of the Kennet to London-bridge is 70 miles. In this part the course is regular. The Loddon, 24 miles long, rises in the chalk downs of North Hants near Basingstoke; the Coln, 38 miles long, rises, under the name of the Ver, in the chalk downs of Hertfordshire, and passes St. Albans, Woburn, Rickmansworth, Uxbridge, and Colnbrook; the Wey, 30
miles long, rises near Alton, Hants, passes Farnham, Godalming, and Guildford, and joins the Thames at Weybridge; the Mole, 41 miles long, rises on St. Leonard’s Forest, in Sussex, passes through Leatherhead, and joins the Thames at East Molesey; the Cran and the Brent, two small streams, each about 18 miles long, rise on the borders of Middlesex and Herts, and join the Thames, the first at Ewelme, the second at Brentford; and the Wandle, a stream only 9 miles long, joins it at Wandsworth. Of these the Coln, the Cran, and the Brent, called the Thames, and the others are local承接 (or artificial) streams, each on the right bank. The name of the Vey appears as an element in the name of Ver-o-lamium, an ancient Roman town close to St. Albans.

Below London, up to which sea-born vessels ascend, the river flows eastward, but with various ‘reaches’ or bends, 56 miles to its mouth, or to the Nore Light (at the commonly reputed mouth) 48 miles. Between Deptford and Greenwich, about four miles below London-bridge, the Thames receives (on the south or right bank the Ravensbourne, 10 miles long, from Keston, near Bromley in Kent; about two or three miles farther down, on the north or left bank, the Lea, 50 miles long, which rises in Bedfordshire, and passes Luton, Hertford, Ware, and Waltham Abbey; four or five miles lower, the Roding, 38 miles long, from near Dunmow, also on the north bank; and six miles lower, on the south bank, the Darent, 20 miles long, which passes Dartford, and receives the Cray. The only remaining feeder of the Thames, and which is required for the navigation of the whole, is the Medway, about 60 miles long, which rises in Sussex, and flows by Tunbridge, Maidstone, Rochester, and Chatham. The principal arm of the Medway joins the Thames at Sheerness just above the Nore; but the smaller arm, called the Swale, which cuts off the Isle of Sheppey from the mainland of Kent, opens into the Thames just above Whitstable.

The whole course of the Thames, from its source to its mouth, is about 220 miles, which is the aggregate of the distances already given.

Length of the Churn

<table>
<thead>
<tr>
<th>Miles</th>
<th>From the junction of the Churn and commonly reputed Thames at Cricklewood to Cricklewood</th>
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<tr>
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<td>Letchdale</td>
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<td>To the junction of the Windrush</td>
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<td>To the mouth</td>
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The principal affluents of the Thames are more fully described elsewhere: the Colne under Gloucestershire; the Windrush, the Evenlode, the Charwell, and the Thames, under Oxfordshire; the Kennet, the Loddon, and the Oek, under Berkshire; the Colne, the Brent, and the Cran, under Middlesex; the Wey, the Mole, and the Wandle, under Surrey; the Lee, the Thames, the Medway, Hertfordshire, Essex, and Middlesex; the Roding under Essex; and the Ravensbourne, Darent, Cray, and Medway with their feeders, under Kent. The Thames, in the first part of its course, belongs wholly to Gloucestershire, but below Cricklewood is almost entirely a border river, dividing Gloucestershire from Wiltshire, Oxfordshire and Buckinghamshire from Berkshire, Middlesex from Surrey, and Essex from Kent. Some part of its course is therefore described in articles on these counties.

Commercial Importance.—The navigation of the Thames commences at Letchdale, where the river is about 258 feet above low-water mark at London-bridge. Its importance was once far greater than that of the Medway, which is now far more important, and of the few articles on the subject.

The Thames and Severn Canal, which follows the valley of the Churn and the Thames from near Cirencester, enters the Thames at Lechlade, thus connecting it with the Severn and the Severn drainage. Of the Medway the whole is navigable: the river formerly extended up to Cricklewood, but since the opening of the canal the upper part, between Cricklewood and Lechlade, has been abandoned. None of the tributaries above Oxford are navigable. At Oxford the Oxford Canal, which joins the Thames at Eynsham, has been opened in communication with the great canal system of the central counties; it follows the course of the Churn (which river is not navigable for) from Abingdon. At Abingdon the Wita and Berks Canal joins the Thames, and, as well as the Kennet and Avon Canal, which joins the Kennet at Newbury (where the navigation of that river commences), 20 miles above its junction with the Thames, opens a communication with the Thames (or Avon Canal) by it with the Severn. The Thames is navigable from Godalming, about 17 miles from its source, to Portishead, near Avonmouth, and from Oxford to Arun and Arun, and the Banbridge Canal, the former of which opens a communication with the river Arun and the Sussex coast. No other feeder above London-bridge is navigable, but from the Grand Junction Canal, which with the Oxford Canal at Braunston in Northamptonshire, opens into the Thames by the mouth of the Brent, the lower part of which is incorporated with the canal. Below London-bridge the Lea, which is navigable, chiefly by artificial cuts, for 25 miles, and has some turns between Stort (Stort) also navigable, opens into the Thames; and just above the Lea, the Regent’s Canal, which encircles the north and east side of the metropolis, and communicates with the Paddington Canal, and so with the Grand Junction Canal, also opens into the river.

The Medway is navigable below Rochester bridge for sea-born vessels, and from Pethursh, above 43 miles as from river craft. The channel of the Thames, in its upper part, is kept up by locks and weirs, the lowest of which is at Teddington, which is consequently the limit of the tide. Teddington is about 18 or 19 miles above London bridge. Highwater mark at Teddington is about one foot and a half above the sea; of this head of tide the time is about two hours later. Low-water surface at Teddington is about sixteen feet and three-quarters higher than at London-bridge. At ebb-tide there is a depth of from 12 to 13 feet water nearly or quite up to London-bridge, and the rise of the tide is about 17 feet, or at the extreme springs about 22 feet.

Vessels of 800 tons get up to the St. Catherine’s Docks, and those of 1400 tons to Blackwall, about six miles below bridge. No river in the world equals the Thames in its commercial importance. The river ford below bridge is crowded with vessels, chiefly colliers, steamboats, and colliers, which move alongside the quays or in turn in the stream; others are moored lower down, though not in such numbers; and for larger vessels the locks are so close and deep so as to be put down to the mouth of the river. There is a dockyard for the navy (now little used) at Deptford, about four miles below London-bridge; one at Woolwich, nine miles below; one at Sheerness, in the Isle of Sheppey, at the junction of the Medway. The Medway is, however, far more important of the four, on the Medway. The fortifications at Sheerness defend the entrance to both rivers; the passage of the Thames is further protected by Tilbury Fort and that of the Medway by Gillingham Fort.

The Medway is almost as navigable as the Thames, and is near 700 feet. For nearly the whole way below London-bridge the river is embanked, and is almost throughout its lower course skirted with marsh-lands, which however have nowhere a great extent. The mouth of the river at Woolwich is about a quarter of a mile; at Gravesend, 26 miles below London-bridge, and opposite Tilbury Fort, it is more than half a mile; about four miles below Gravesend it is nearly a mile, and then gradually increases to the width of about 3 miles, and, in passing to the point where we have fixed the mouth.

It is a common opinion that this river in the upper part of its course is properly called Isis, and that it is only below the junction of the river by which it is called Thames, that it is properly called Thames, which is the name used by Tacitus, and is not formed by connecting Isis and Thame and Isis. But Camden observed long ago that this is a mistake; that the river was antiently called Thame in its upper part as well as in its lower part; that the name Thames has been transferred to another river used by the common people, but only by scholars. Caesar writes the name Tamesis (evidently Tames or Thames, with the addition of a Latin termination. Tacitus writes it Tames, and Dion Cassius Topianus, which is the same name, with a Latin termination, and the same spelling, as it appears in Tacitus. The name Tamesis, or in some MSS. 'Tamesis, and in some editions 'Tamesis; all which we suspect to be forms of the same name, 'I having been by the carelessness of some early
In Richard of Cirencester it is Thames.

(Ordnance Survey; M'Culloch's Statistical Account of the British Empire; Camden's Britannia.)

THAMES, a certain jurisdiction, though not undisputedly exclusive, appeared in the present

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five hides of land in full property, with a church, a kitchen, a bell-house, a burgheate seat (or office of magistrate in a borough); however, in the case of a man, the result is doubtful, he shall henceforth be a thane by right. Five hides of land was probably the amount demanded even for a thane of the highest order; although it appears from Domesday-Boo that the king had made the owner own as many miles, or liable to be called out on the king's military service. Many lands are mentioned in Domesday-Book as thane-lands (terre tainormum); and it is probable that the dignity, like the title of baronet, was hereditary, descending in a particular estate. Thanes were among the members of the Saxon Witanagemot, or parliament, but it is matter of dispute whether they sat in their own right or as elected representatives. The principal facts connected with this dignity have been collected by M. R. W. Grant, in his 'History of the Anglo-Saxons,' Eay. London, 1823, vol. iii., pp. 81, 187-206, 227-231; and by Sir Francis Palgrave, in his 'Rise and Progress of the English Commonwealth,' 4to., 1832, i. 15, 577-579; and ii., cccxlv.-cccxxv.

There is little mention of the thanes in England after the time of Henry II.; but Lord Hailes has shown (Anales, i. 28) that in Scotland thane was a recognised title during the fifteenth century. In the 'Chronicles of Moray' mentions a thane of Cawdor in 1492. It appears from the first to have implied in Scotland a higher dignity than in England, and was for the most part synonymous with earl, which was a title generally annexed to the Scottish nobility. It was sometimes assumed that thane is the more antient title, and that it began to be exchanged for earl in the reign of Malcolm Canmore; but, according to Pinkerton (History of the House of Stuart, i. 161), the title of thane was not introduced into Scotland till after the union of Malcolm. 'Yet he adds, 'the difference between a thane and baron is unknown; and some doubts arise that ignorance may have blends the Saxon thane and the Ingh Tanet.'

THASOS. [XERT.]

THANN. [RHIN., HAUT.]

THASPACUS, or THA/PSACUM, was a very antient, populous, and commercial town in Syria, on the right bank of the Euphrates, about 24 miles west of the junction of the river Chaboras (the Arazus of Xenophon) with the Euphrates. Thaspasus, the Thiphas of the Bible (1 Kings, iv. 24), the Tapha of the Vulgate, and the Thasp of Josephus (Antig., ix. 11), was the most eastern town of the kingdom of Solomon after David had conquered the country to the south of the Euphrates. The King of the Medes was from Tyre by land and from Babylon by water, Thaspasus became an emporium, where the Gerrhasi kept stores of the commodities and spices of Arabia, which they carried through the desert, probably by an old road which were afterwards transported by land to Syria and Phoenicia and their commercial towns on the Mediterranean. (Strabo, vi., p. 766, Casi.) Its military position was also of great importance. At the time of the expedition of the younger Cyrus (a.c. 401), there was a ford at Thaspasus, but no bridge; subsequently there was a bridge. This town was the most southern passage by which an army could penetrate, either from Mesopotamia into Syria and Cilicia, or from these countries into Mesopotamia and Persia, without being obliged to traverse the deserts of Arabia, which occupy the whole tract between Palestine and Phoenicia in the west and the lower part of the Euphrates in the east. The younger Cyrus crossed the Euphrates at Thaspasus (Xenophon, Cyroped., i. 6); but Strabo also speaks of the river at Thaspasus when he was advancing against Alexander in Cilicia; and Alexander, when he was pursuing Darius into Assyria. (Arrian, 2. 13; 3. 7.) In the age of Strabo the bridge at Thaspasus existed no longer, and the passage of the river was entirely by means of a ferry at Copassus (Strabo, p. 747, Casi.). The circumstance of Thaspasus being a town from which military and commercial roads ran in every direction, was probably the cause why Ktesosthenes chose it as the most suitable of all the chapels of the dominions in Asia Minor and the adjacent countries, of which Strabo gives an account (ii., p. 77-91, Casi.). It has been said that the antients did not agree on the situation of Thaspasus, Polemy (v. 19) putting it in Arabia Deserta, and Pliny (Hist. Nat., v. 24) and Stephanus Byzantinus and Q. Curtius (x. 1) in Syria. But the town was too well known to allow any such doubts, and the only fact which follows from these different statements is that the ancient geographers were not aware of the existence of a town called Aderiana Deserta which joined, near Thaspasus. Pliny says that in this time this town was called Amphipolus, but this is very doubtful; nor is it true that Sceteus Nicostor founded Thaspasus: perhaps built it in a new settlement. According to Stephanus, the Syrians called it Turnasad; and D'Anville states that there is now a small town on the site of Thaspasus, which has the Arabic name of 'El-de,' or 'the door,' in the Lingus Franca 'Porta Cedis.' D'Anville, 'Proc. Soc. Antiq.' 4th s., vol. ii., 141; Osi- larius, Notitiae Orbis Antiqui, vol. ii., p. 367, 369.)

THAPSIA, the name of a genus of plants belonging to the natural order Umbelliferae. The species are perennial herbs, with doubly or trebly pinnate leaves, large compound umbels, without involucres, with yellow rays, and yellow flowers. The margin of the calyx is 5-toothed; petals elliptic, entire; fruit compressed from the back; mericarps with 5 primary fimbriae ribs, 3 of which are dorsal, and 2 lateral in the commissure, and with 4 secondary ribs, of which the 2 dorsal are fimbriiform and the 2 lateral ones membranous and winged; vitre in each furrow underneath the secondary ribs.

The species are mostly natives of the countries of the Mediterranean, and are known under the generic name Deadly Carrot.

T. illusia, Velvety Deadly Carrot, has a square glabrous stem; tri-pinnate leaves, many-parted leaflets, villous as both surfaces, lower ones deflexed. This plant is found in the Pyrenees and France, in the northern coasts of Africa. Pointet states that when fresh the root is acrid and corrosive. In Barbary it is used as a remedy for some forms of cutaneous disease, but it appears to be a severe application and attended with inflammation and vesication. T. spilium, Spilium Deadly Carrot, has a square glabrous furrowed stem; pinnate leaves, many-parted leaflets, all linear, hairy on both surfaces, with revolute margins. It is a native of the north of Africa. It is covered with a greyish-down which is supposed to be the plant that produced the juice called Sphingium, and which was held in so high repute by the antients, that a district where it grew was abundance called 'Silphifer.' [Sphingium.]

T. Garganica, Garganica or Greek Deadly Carrot, has a square glabrous stem; bi- or tri-pinnate shining leaves; segments linear, acute, elongated, quite entire along the margins; involucres with few leaves; fruit cordate at the base. This plant is a native of Calabria, Messynunts among the Calabrians, it is covered with a greyish-down which is so common in Greece and the neighbouring islands, and concludes that it is the *Silphium* of Dioscorides, with whose description it agrees better than any of the rest. It is one of the most stately plants of the family, and was introduced into England by the Royal Gardens of this country about the year 1658. There are seven other species of this genus referred to by Des: they possess the active properties of the above, but are seldom employed at the present day.

In their cultivation the species of Thaspia require but little care, as they will grow in any common garden soil. They may be propagated by seeds, which should be sown in autumn as soon as they are ripe.

THASOS (θάσος), now Thassos, or Tasso, an island situated off the coast of Thrace, at a short distance from the mouth of the river Nestus or Karasou, and a little to the south-east of the Gulf of Kavalo. Volgaro, which is nearly in the centre of the island, is in 41° 49' N. lat. and 25° 50' E. long.

Five expeditions before the time of the Grecian Ex- cules, Thassos was peopled by Phoenicians, who came from Tyre in quest of Europe, led by Thassos, son of Agar, from whom the island is said to have taken its name. It is called Cyprus and Rhizia (Pliny, iv. 13) and Chryse, from its gold mines (Euthast., Ad Dionys. Perieget., 317) and is also distinguished by the epithet Ogygia. It was afterwards colonised by settlers from Paros (Thucyd., iv. 104) among whom the most distinguished was called Cynthis, and Amphigoras, and Timon, Pausan. 5, 28, 6, 708, who does not decide the question. Thassos was enriched in very early times by the possession of gold-mines in the island, and at Seapate Hyle, on the opposite coast of Thassos. According to Herodotus, who visited them, the most considerable were those which lay
been worked by the Phrygians on the north-east of the island, the excavations for which were very evident (v. 107). But, for the present, the fields of these mines, and of their continental territory, which must have extended for some distance along the Thasian coast, there accrued to the Thasians in his time from 200 to 300 talents yearly of which sum the mines in Scampe Hyre produced 80 talents, a remission of one fourth, and a 20 per cent. loss. (See the remarks on this passage in Boeckh, Public.

The ancient town of Thasos is situated on the north coast of the island, and occupies the entire western third of it. The site is remarkable for its steepness and for its fertile soil. The city has never been visited by the Athenians except from taxation. The Thasians appear to have regarded some of their continental possessions, and as others 369 they fortified Cre- 

The Thasians were short afterwards released from his rule under the Romans, 197. (Polyb., xv. 38.) They were short afterwards released from his rule. The emperor Thasos is styled Libera, or a free state. In the Simeonedomus of Hiero, it forms part of the Imperial Simeonedomus, 4, and is placed by Constantine Phosphorogenetos in the islands of the

The coins of Thasos are very numerous. The silver coins may be generally arranged under three classes: 1. thesoi, on which the type is a satyr carrying off a nymph; 2. the so-called "silver coin," which, with the addition of gilded and colored inserts, is known as a "silver coin" or a "coin of Thasos;" and 3. the "electrum coin," which is a combination of gold and silver, and is known as an "electrum coin." These coins have been found in Thasos, and are probably of Thasian origin, since they are not found in any other part of the island.

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Thatching is usually paid by the square of 100 square feet. The Thatcher takes a line and throws it over the stack; if it is square, the ends are pushed under the eaves in each case, and by allowing for the length of the eaves, the length is multiplied by the length of the eaves, with the same allowance at the ends. The price varies from 2s. to 7s. or 8s. per square, according to the work. Round stacks are measured by taking the circumference of the eaves, and then a third of the scant of the case, with a similar allowance.


Thatched. [Essay]

There are a genus of plants of the tribe Canellacea, and natural family of the Ternstromiacen, which has been so named from the slightly altered Chinese name of the dried herb which now forms the almost universal beverage of the British Isles. Though now extensively employed, the introduction of tea into Europe is of comparatively recent origin. Macpherson, in his 'History of European Commerce with India,' states that 'tea (sth) is mentioned as the usual beverage of the Chinese in the reign of the soul which began in the East about the year A.D. 850,' and that he was unable to find any mention of it prior to the times of the Jesuit Missionaries, who entered China and Japan a little before the middle of the sixteenth century. Anon. in the 'Anecdotes of China,' p. 74, quotes Bowers as giving the earliest account in 1580, where he says that 'they, that is, the Chinese, have also an herb, out of which they press a delicate juice, which serves them as drink.' """...""

The word tea is derived from the Chinese 'cha-k'unun.' In the year 1662 King Charles II. married a princess of Portugal, whence, Waller says, 'the best of queens and best of plants we owe to that blessed nation,' &c. But tea must have continued to be brought on such a scale as to enable the English East India Company to purchase, in the year 1678, they imported 4713 pounds of tea, which was then for the first time thought worth their attentions as a branch of their trade. (Macpherson, p. 191.)

Tea must have been used in China from very early times. It is differently named in different parts of China, as tea, or chia, also than, whence we have thea, and the tea is Persian words in use in India, tea is called cha-khanen, or tea of Cathay.

The genus Tha is characterised by having a calyx which is persistent, without bracts, five-leafed, leaflet imbricated, the outer ones smaller. Petals of the corol 6 to 8, hypogynous imbricated, to the calyx, and usually together at the base. Stamens numerous, in several rows, adhering to the bottom of the petals; filaments filiform, anthers incumbent, 2-celled, oblong, with a thickened connective, cells opening longitudinaly. Ovary 4-5-celled, the ovules numerous, on the central axis, the upper ones ascending, the lower pendulous. Style trifid, stigmata 3, acut. Capsule spheroidal, two to three lobed, three or by abortion 3-celled, with carinal dehiscence, or with the dissections formed from the turnip edges of the valves. Seeds solitary, rarely two, in cells, shell-like testa, marked with the ventral umbilicus. Cotyledons thick, fleshy, oily. No albumen. Radicle very short, very near the umbilicus, cotyledon.

The genus Camellia is usually considered to be very distinct from Tha; indeed by Camassius the two are supposed.
The species of the genus Thea are few in number; some botanists are of opinion that even these are varieties of a single species. Before proceeding to discuss the question of the species which yield the teas of commerce, it is desirable to notice a few which are usually described as distinct in systematic works.

T. viridis is a large, strong-growing, almost hardy plant, with spreading branches, its leaves three to five inches long, thin, almost membranous, very broadly lanceolate, or oblong, with the apical two-thirds of the lamina being lacinicolous at the junction of the sinuses. The inflorescence in both, he says, is of the same nature, that is, lacinicolous, and the only difference that does really exist is simply of specific value, consisting in the fruits of the tea-plant being three-lobed, of the Camellia triangular.

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T. bohea is a smaller plant than T. viridis: its branches are stiff and straight, its stem erect, the leaves not above half or two-thirds of the size of the former species, elliptical-oblong, perfectly flat, more coriaceous, of a dark green colour, with small and even serratures; they are numerous, and have in their axils two or three flowers, of 5 sepals and 5 petals, these are smaller and have a slight fragrance, and flower later in the season than T. viridis. The plant is much more tender than the green tea-plant, and unable to stand the cold of an English climate. It is supposed by some to yield the leaves which are converted into black teas, and, notwithstanding contrary statements, leaves similar to those of this plant may be recognised on infusing and examining them for their characteristics and flavour in commerce. A variety of this is sometimes called T. stricta; it is figured by Loddiges, Bot. Cab., t. 228, who, as well as Sir W. Hooker and Dr. Rose, subscribes to it, as a species.

The Assam tea-plant, which has lately attracted so much attention, seems to partake of the characters of both the foregoing. The Calcutta Tea Committee say, in 1865, that the situations examined in the plains, and not only is it a genuine tea, but that no doubt can be entertained of its being the identical tea of China, which is the exclusive source of all the varieties and kinds of the tea of commerce. To this it may be replied, that there are considerable doubts whether the teas of commerce are all derived from one species of plant. Mr. Griffith says, in the size both of the plant and of the leaves, as well as in the texture of these last, and in its state of development, it approaches to the green tea-plant of China; in its geographical distribution, as far as latitude is concerned, it approaches to the black tea. The inflorescence of the Assam tea-plant varies, but perhaps its usual state is to have the flowers solitary in the axils of the leaves, but the plant may yield an indehiscent capitate inflorescence. The plants introduced into this country have their leaves much larger and thicker than those of the green tea-plant, and Mesarod Loddiges finds that it requires much greater degree of heat, in fact that of the hot-house, while the others are in the open air for a week or so.

Two other species, described by Loureiro, are little known, as T. Cochinchinesis, about eight feet high, having lanceolate, flowers of 3 to 5 sepals and 5 petals, solitary, terminal; and T. oleosa, found in the north of Cochinchina, where it is also cultivated, being used medicinally by the natives as a diaphoretic. T. oleosa is also a shrub of eight feet high, found in the fields in the neighbourhood of Canton, and named from its seeds yielding a large quantity of oil, which is used for burning in the East India College.

Besides the characters of the several species of Thea, we have to notice the parts of the country where the cultivated species are found; these are of considerable importance are connected with the subject. But here it is difficult to be precise in our statements, because we are without positive information from the tea districts of China, and also because it is still doubtful whether one or more species of commerce in permanent varieties, or whether the differences in teas are owing solely to differences in manufacture. Tea is cultivated in China over a great extent of territory. Mr. Wallich mentions that tea is cultivated in Assam, in 17° N. lat. We know it is cultivated in the southern provinces of Yunnan and of Canton. If we proceed north we find the principal cultivation of tea for the foreign trade is between 27° and 31° N. lat.: this tea is said to be produced in the plains, and not northward of 31°; even in 36°, and also in the Japanese islands, which extend from 30° to 41° N. lat. It has been disputed whether the tea-plant is cultivated in plains or mountainous situations. It is generally stated to be cultivated in hilly situations. Grouzier states that the songlo-tea (our green tea) takes its name from the mountain Song-lo, situated in the province of Kiangnan, in 30° N. lat., while the bou-tea (bocha) takes its name also from a mountain called Bou-y, situated in the province of Foo-kien. Mr. Cunningham (when Chusan had formerly a British factory) collected specimens on the tops of mountains, where the tea-plant flourished along with pines. His specimens are still in the British Museum. The reputation sent into Assam to examine the species of the tea, saw it growing in the valley of Assam, and were thus led to think that it must grow in similar situations in China: but even in Assam it is also found on hills; and there is no doubt found in both, whether one or more species of commerce is cultivated in China, and it is said the tea from the sunny tracts are the best. Some soils in which the tea-plant is cultivated in China yielded, on analysis, in 200 parts—of nitrates, 130; alumina, 36; carbondioxide of magnesia, 6; carbondioxide of lime, 4; oxides of iron, 13; roots and fibres of...
plants, 2; water of absorption, 4. Dr. Abel thought that the debris of granite rocks would yield a fitting soil, and that the Cape of Good Hope would afford a suitable climate. The climate varies, no doubt, to a considerable extent in different parts of China, being warm in the southern and cold in the northern provinces. Some is said to be too hot, this is the case for days together upon the green tea, and the green tea-plant in this country able to bear a greater degree of cold than the black, which, in China, seems to be confined to the more southern provinces; but even in the northernmost part of it, Dr. M. Callety, the writer of this article that he has walked on snow in the midst of the tea-plants. The culture of the tea-plant in China seems simple enough: the plants are raised from seeds, sown in the places where they are to remain, and are dropped into holes from one to four inches deep and three or four feet apart, shortly after they ripen; or in November and December, as they do not preserve well, from their oiliness. The plants rise up in a cluster when the rain comes on, and require little further care, except that of removing weeds, till they are three years old, when they yield their first crop of leaves. They are seldom transplanted, but sometimes four to six plants are put close together, so as to form a fine bush. After growing seven or ten years they are cut down, in order that they may bloom more freely and in the winter season, which affords a more abundant supply of leaves. In some districts the bushes grow uncontrolled, in others they are regularly pruned, to keep them low. The gathering of the leaves is done during the months of April and May; they are gathered singly, first in March or May (according to the district), when the young leaves are scarcely expanded; the second about two months later, or May and June; and the third in August, or about six weeks after the second; but the leaves they differ in size, some being gathered when they are fully expanded, and having the number of leaves which are obtained, some avoiding the third, for fear of injuring the bushes. When the leaves are gathered they are dried in houses which contain small furnaces. The leaves are then collected, if there is a fire pan, and upon this, when heated, the leaves are partially dried by exposure to the sun, are thrown; the leaves require frequent shifting and turning. When all are properly dried, they are quickly removed either by the hand or with a spade, and either thrown upon mats or into baskets which are kept ready to receive them. They are then removed to a table where they are rolled and cooled, and the process is repeated; after which they are sifted and sorted into several varieties. The process has been very minutely described in Asia, and it is found that the Chinese tea-makers. We may therefore refer to the accounts published by Mr. Bruce, as well as those of the superintendent in Java, translated by Dr. Horsfield. The subject of this question is to determine whether the green and black teas are produced by one or two distinct species of plants, as the statements of apparently equally well qualified judges are not only contradictory, but directly the reverse of each other. The difficulty of the question is very great, but there is an important point which the tea districts of China, and also to the Chinese in the neighbourhood of Canton being able to prepare a tea which can be coloured and made up to imitate various qualities of green tea, and large quantities are thus yearly made up. The Chinese tea-makers in Assam and those in Java alike state that the black and green teas may be prepared from the same plant. But as there are plants of the genus Thea, of which the leaves resemble some of the black and green teas of commerce, and as these differ very considerably from one species to another, it is possible that the green tea, and there are green tea and black tea districts (the former to the north of the latter), it seems probable that different plants are preferred for preparing the finer qualities of the tea. Whether these plants are of one species or well-established varieties, can only be ascertained by the professional botanists who have an opportunity of visiting China, or by experiments made in the tea nurseries of Assam and of the Himalayas, by sowing the seeds of each kind in different soils and elevations, and comparing the plants which are produced with one another. Tea having become so extensive an article of commerce, and a source of considerable revenue, various attempts have been made to introduce it into other countries, but the attempts are various points in which the several experiments have been made, as in Rio Janeiro and the warm part of Brazil, and latterly in the hilly parts of Java and Brazil, in Penang, Assam, and the Himalayas. Dr. Abel recommended the Cape of Good Hope. It is a requisite to have not only a suitable soil and climate, but also cheap and abundant labour. Many have been of the opinion that tea could be cultivated in the Himalayas, but the first published opinions seem those of Dr. Royle (J. Ill.ustr. Himalayan Botany, p. 194) where, from consideration of a similarity in latitude, climate, and vegetation, as far as these were concerned, he was of opinion that tea could be successfully cultivated in the Himalayan mountains, for the different elevations allow of every variety of climate being selected, and the geographical distribution of this is such that the leaves of four or five different varieties, varied, to warrant its being beneficially cultivated. He recommended experiments being made in the tract of the Himalayas, extending from Almora nearly to the Sutlej, at various elevations from the valley up to 7000 feet, and that about 5000 feet of elevation would afford a suitable climate. Dr. Falconer formed similar opinions at the same time in a report to government. The correctness of these opinions has been clearly proved by the lately received successful importation of the tea plants to the Kumaon and Gurious districts of these mountains, which were formed when the tea nurseries were established in Assam, and the seeds and plants sent up which had been obtained from China. In this report, Dr. Falconer says that the Honorary Agricultural Society of Calcutta, we find that at elevations of 5000 and 6000 feet there are some hundreds of strong and healthy-look-plantails, with the benefit of both good and bad years, and the same degree of height and vigour as in the garden in Assam, with the same agricultural practice, may be safely pronounced to have completely succeeded. It is also said, 'Assam has doubtless a great advantage over Kumaon and Gurious, and in the extreme hilly districts, the experience will probably be found to yield a produce of a superior quality.' The quality of the tea which can be prepared here can only be ascertained when China tea-preparers have been sent there, as they do not exist at present; by such agents, by the nervous precision, the Chinese have been able to produce in China, and in Travencore, will be found favourable. The value of these facts can only be properly esti- mated in connection with the success of the tea-culture in Assam, which is several hundred miles distant from Kumaon and Gurious, and it is in the hilly part of the mountainous part of the Himalayas will be favourable to this culture: probably also among the mountains of the peninsula, as in the hilly district and in Travencore, will be found favourable. The value of these facts in connection with the success of the tea-culture in Assam, which can be determined by the nervous precision, the Chinese have been able to produce in China, and in Travencore, will be found favourable. 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to excessive moisture. As tea-plants are capable of bearing considerable varieties of temperature, tea may no doubt be cultivated in a variety of situations, and in Assam as well as elsewhere, but it is probable that hilly situations and the more open and elevated parts of Assam itself will be best suited for the production of the finer-flavoured teas. The tea which has been planted in Assam has now been in the market for a few years, and in each year the quantities have increased and the qualities have improved. For the teas first sold in 1839, from the excitement and competition created by the novelty of the sale, extravagant prices were paid, as from 2 l. Od. to 10 l. Od. The probable value was however from 2s. 11d. to 3s. 3d. The produce of 1841 in the government plantations has been sold in Calcutta, and that from the Assam Tea Company sent to this country. Very favourable reports have been published by brokers of the quality of this tea, and of the probability, from its strength, that it may easily be improved as its nature is better understood. Experimental nurseries continue to be carried on by the East India Company, and much useful information of a practical nature will no doubt be obtained and promulgated. So many authors have written on the subject of tea, that it is impossible to quote them. Dr. Lettsom, in his account of the tea-plant, has given a list of the different sorts of tea in the plant, and so inferior is the Chinese tea to the Japanese, that the travels of Abel, Staunton, Ellis, Barrow—and for scientific information see Royle, 'Illustr. of Himalayan Botany,' and 'Essay on the Production of Indian Tea,' also the papers of Messrs. Griffith and MacCleland, in the 'Trans. of the Agric. & Horticultural Societies of Calcutta.' It is a commercial product of the greatest importance to the country, and much could be written on the part of the brokers. For practical information on the manufacture of tea, the papers of Mr. Bruce give much valuable information, derived from the China tea-makers; also the 'Experiments on Cultivating the Tea in Java,' translated from the Dutch by Dr. Horsfield.

THEA. Medical and Dietetical Properties of Tea. This article, the use of which was for a long time confined to two countries of the East, China and Japan, has within the last two or three years been introduced into Europe, and is now sensible in every civilized country of the globe. It is therefore interesting to enquire what are the properties it possesses, which have induced so large a portion of the human race to forsake other articles of diet, and what are the effects of its use. Whether obtained from one species only of the genus Thea, or from several, all the tea of China is in commerce brought under two distinct terms, green tea and black tea, or rather brown tea. These are also distinguished as hyson and congou, and the common language of the province Fu-kian (Fokien of D'Ainville), where this article is called Tall in their patois; at Canton it is called Tcha or Tchaa. Black tea is called nick, or jyson; but by the Chinese a black kind has been long known in commerce under the corrupted name of Bou-uy-Tcha; hence by a transposition of the syllables, the Thae bohea of Linneaus, the Fu-y-Tcha of the Chinese, that is, tea from Fu-y-Schan, which is in province of Fu-kian, in 27° 47' N. lat. Hyson is chiefly obtained from Song-lo, which lies in the province of Kiang-nan, in 29° 58' N. lat.

The subvarieties owe their names to other circumstances, the number of which is endless. Thus there occur in the catalogues of China tea over two hundred and fifty names, many of which are synonyms of other sorts, or names invented to impose on foreigners and obtain a high price. The distinguished Oriental scholar's approach gives a list of above forty genuine varieties, with an explanation of the terms applied to them. (Journ. Agnatique, 1824, p. 121, and Abel Remusat, a Supplement to it, p. 186 of the same journal; or Fée, Cours d'Histoire Naturelle Pharmaceutique, l. p. 507.) Thus the names of these are the 'black uluv,' the 'white down,' being the first sprouts, or yet hairy leaf-buds of young plants, three years old, after their flowering. With us it is applied only to a black tea, but it is equally applicable to a green tea, and is by the Chinese applied to the liquid town, literally 'the tea of the wells of the dragon,' which is never brought to Europe, as it is so delicate and slightly fired as to spoil by the heat of transport. (Davis.) The true imperial tea, also called flose, not that it is the flower-buds, as some suppose, but merely the perfection of tea, never reaches Europe, as the damp of the voyage and a northern climate would soon impair its qualities. That which is sold under the name of Imperial is Oolun, or Soulei, flavoured with the lan-hoa, which is the Chinese name for the Olea fragrans, Lin.

Though it is stated that black tea may be cured as green tea and green tea as black, certain it is that the preparation of the respective kinds is differently made in the factories of the empire, and different practices pursued with the leaves from the first stage. In the green teas the leaves only are taken, being nipped off above the foot-stalk or petiole, while of the black variety the leaves were collected. 'Thus black tea contains much of the woody fibre, while the green is exclusively the fleshy part of the leaf itself; which is one good reason why it should be dearer.' (Davis, ii, p. 351.) Besides this, the constant removal of the young leaf-buds, by which the plant is prevented from being clothed with full-grown leaves, which alone can elaborate the sap, and contribute to the further growth of the shrub, causes it to perish earlier, and compels a more frequent renewal of the plantations. Indeed some cultivators restrict the gathering of the leaves to two harvests, instead of three, to save their plants.

Those of the third gathering are large and coarse, and often so rigid that they cannot be rolled. This yields a very inferior tea, which it is considered only by the poorest of the natives, or, when very bad, are some of the finer kinds when spoiled, used for dyeing.

Such are the pains taken to ensure the excellence of the finest sorts, that for two or three weeks before the harvest is proceeded with. The dealers, with the hope of business from a very early age, are prohibited from eating fish or other kinds of food reckoned unclean, lest by their breath they should contaminate the leaves. They are also made to take a bath two or three times a day, and not allowed to gather the leaves without being in a state of cleanliness. The following day they become black and lose much of their virtue. Previous to putting them into the iron pans or furnaces, which are heated by charcoal, some writers say that they are dipped for about half a minute into boiling water; others do not mention this. About half a pound or three-quarters of a pound of leaves is put into the pan at once, and diligently stirred, to prevent them from being burnt. They are then removed with a shovel and thrown on mats or into baskets, and while yet hot the soft leaves are rolled before the fire. The quantity of yellowish green juice exudes from them. This process of roasting and rolling is often repeated even to the sixth or seventh time. This method is called the dry process, or the least cost of preparation, and the vapour of boiling water, after which they are rolled and dried on the iron pans like the others. Leaves prepared in the wet way have a bright green colour; those by the dry, a dark green verging to brown. From the green teas, when prepared in the dry way, less of the above-mentioned juice exudes, a circumstance to which the greater power of green tea is in some degree owing. The larger leaves are generally selected to be prepared in the wet way. By the process of roasting the leaves lose two-thirds of their weight, which is carried off in leaves dry, or the pound of tea fit for preservation. It is by the process of roasting that the flavour is first developed, the leaves when fresh being as insipid as the bean of coffee before heat is applied. Siebold is of opinion that the agreeable violet-like flavour of tea is inherent in the leaves themselves, but most writers ascribe the different flavours of the chooser kinds of tea to the admixture of the flowers, leaves, or oils of a variety of different plants. The chief names of these are Citrus aurantium, Efeus, Gardenia florida, Aglaia odorata, Mogorium (Jasminum) Sambuc, Vitex scipeta, Camellia sinensis, and C. oleifera, Illicium anisatum, Magnolia fukan, and the Roni Indica odoratissima, as well as with the root of the Ruta Chino, Cloves, or Mace, with the stroud, tobacco, and oil of Bixa Orellana. A variety of tea called Sonchi is often found to contain a large quantity of ferruginous dust, but whether by accident, as Mr. Davis thinks (Chinese, ii, p. 482), or a fraud to increase the weight, is doubtful. Its
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presence may easily be detected by passing a magnet into a suspected sample, when some of the particles of iron would adhere to it.

The Chinese annually dry many millions of pounds of the leaves of different plants, to mingle with the genuine, such as those of ash, plum, &c., as the name Mei-Plan, sold to one of the tea merchants from Kiang-nan, imports; so that all the spurious leaves found in parcels of bad tea must not be supposed to be introduced into them by the dealers in this country. While the tea-trade was entirely in the hands of the East-India Company, all of the adulterated teas were shipped for this country, as experienced and competent inspectors with large salaries were kept at Canton, to prevent the exportation of such in the Company's ships; but since the trade has been opened, all kinds find a ready outlet, and, as the demand exceeds the supply, a fact, a manufacturer's article is furnished to the rival crews.

The object of the drying and rolling is both to diminish the bulk and to enable the leaves to preserve their flavour. No tea is thought fit for use till it is a twelvemonth old; and the rich and luxurious Chinese keep the fine tea in jars, made of the finest porcelain, some of which are thought to communicate an additional aroma to the tea, and all of which have very narrow mouths (as may be observed in those brought from the country and sold at a hard price), to retain the peculiar odour. If the tea contracts damp, it is taken out and roasted again.

The taste of tea is more or less astringent, and, before it is infused, unpleasantly acid. To make the infusion, the Chinese germinate a large portion of the leaves, but do not allow it to stand or macerate, as is done in England, but instantly pour it off again, by which they obtain only the more volatile and stimulating portion of its principle. In China, as in India, the tea is boiled, that the finer and coarse leaves, which alone are within their reach, and drink the decoction repeatedly during the day. This is done not only to extract such virtues as the tea possesses, but to qualify the water, as little good drinking water is to be had in China. These tea-drinkers find a substitute for a tea a very valuable accomplishment on long journeys, as it improves the most brackish waters. The exciting effects of fresh tea are such that it is rarely used till it has been kept twelve months, as already stated; and where indulged in, it produces a great disturbance of the mind, almost resembling the delirium, the action of the Erythroxyl Coca among the Peruvians, and inducing a tremulous motion of the limbs. This property is diminished by repeated roasting, but the green tea is more exposed to this than black, it retains more of this power. Besides, the green tea for export undergoes some process, which changes its colour, giving it a bluish-green hue. The Chinese themselves do not consume those kinds of green tea which are prepared in this manner. (Davis, Chinese, ii, 481.)

To the tossed together a mistake to suppose that the colour of green tea is owing to its being dried on copper pans, as none such are used, and the most searching chemical analysis is unable to detect, a trace of copper unless as a constituent of the vegetable. The chemical analyses of tea does not shed much light on its action on the human system. Frank and Sir H. Davy found more tannin in black than in green tea; but the results of Mr. Brande's researches, conducted on a more extensive scale, give a different result. Some years ago I examined the varieties of tea in common use (Quarterly Journal, xii. 201), and found that the quantity of astringent matter precipitable by gelatine is somewhat greater in green than in black tea, though the excess is by no means so great as the comparative flavour of the two would lead one to expect. The entire quantity of soluble matter is also greater in green than in black tea, but the extractive, not precipitable by gelatine, is greater in the latter.

The following table shows the respective quantities of soluble matter in water and in alcohol, the weight of the precipitate by unguineal, and the proportion of inert woody fibre in green and black tea of various prices. It is given, not to express the importance of the differences from the point of view, but for the different qualities and effects of tea, but as containing the results of actual experiments. It will be remarked that when tea-leaves have been exhausted by water repeatedly affused, alcohol is still capable of extracting a considerable quantity of soluble matter; the alcoholic extract infused in boiling water, furnishes a liquid which smells and tastes strongly of tea, and which, were it not for the exasperate of the solvent, and the trouble of resolving its separation, might perhaps be profitably employed.

<table>
<thead>
<tr>
<th>Soluble in Water.</th>
<th>Soluble in Alcohol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Hyson</td>
<td>94.3</td>
</tr>
<tr>
<td>Black Southing</td>
<td>86.0</td>
</tr>
</tbody>
</table>

(Brande's Manual of Pharmacy, 5th ed., p. 124.)

The fall in the prices of tea does not much affect these results, as the same relative proportions are preserved. The alkaloïd-like principle of tea can scarcely be considered the cause of the peculiar action of tea; but it is very interesting from the circumstance of the identity of its composition with that of coffee, and of the genuine officinalia, as shown by Liebig:—

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>49.77</td>
<td>101</td>
<td>69.68</td>
<td>12.4</td>
<td>0.07</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>5.33</td>
<td>5.214</td>
<td>5.139</td>
<td>5.822</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bergna obtained an oil, but this, as well as the distilled water, he found to have little peculiar effect on several animals which in opposition to the action of the genuine. Lettsom, who represents the distilled water of tea as a very powerful narcotic, paralysing the limbs of frogs, and even causing their death when applied to the exposed nerves.

Before attempting to estimate the action of tea on the human system, it is necessary to call attention to the observation of the effects are due to the plants mixed with the real tea, several of which, such as the Chloranthus inornatus are stimulants of the highest order; and in other instances deleterious chemical compounds are used by the Chinese to convert damaged black teas into saleable green teas (Davis, Chinese, ii, 466.) For the effects of these, tea is not justly chargeable. A correct estimate of the action of tea is not easily formed; yet the most dispassionate inquirers regard it as a narcotic, the stimulating period of which is the most compromising. Tea has been preposterously praised by some writers, and unjustly accused by others as being productive of numerous diseases; above all it has been charged with causing a great number of nervous diseases. (Davis, Chinese, ii, 462.)

It is more just to attribute the increase of such complaints to the more complicated state of our social relations, drawn from an augmented population, and an advance in luxury, with the more frequent infringement of the natural laws, among young men at an early age; the night, as is the practice of the votaries of tea. That the universal employment of tea has displaced some other kinds of food is certain, but if a diminution in the number of inflammatory diseases be one of the consequences, it is much to its credit, as however distressing nervous diseases may be, they are by no means so fatal as those of an inflammatory kind. That tea should not save all constitutions or all ages is not remarkable. It is less suited for young children than for adults; indeed for young children it is desirable that it should not be used at all, as it has all narcotics, a morbid state of the brain and nervous system. It is also unsuited for those of an irritable nature, and likewise for those of a leucophaeitic constitution. Such persons can ill bear much liquid of any kind, particularly in the evening, and prosper best on a very dry diet, to which growing children of this constitution should be strictly confined. (Dillenius.) It may not be true that the use of tea, as alleged by Dr. Lettsom, has been a main cause of the increase of phthisical diseases. Diseases of this class are the only diseases which are prevalent by the reports of the registrar-general to be stationary, or perhaps more frequent than others, whatever impairs the nervous power and ultimately the digestive functions. This argument was made on the authority of the text where it says, 'It ought by no means to be the common
diet of boarding-schools; if it be allowed sometimes as a treat, they should be at the same time informed that the constant use of it would be injurious to their health, strength, and happiness. Then, when it is allowed as a treat, it is the plethoric and sanguine. Upon the same principle it is a proper article of diet and perhaps the best common drink at the beginning of fevers and inflammatory complaints. It is the state of the brain, termed by Mr. Newnham (Observations on Medical and Botanical Properties of Green Tea) athenic excitement, a state clearly bordering on inflammation, especially if produced by alcoholic stimulants, or by intense and long-continued application. It is also an aid to any object of medicine; green tea acts as a salutary remedy. On the contrary, in states of diminished excitement, morbid vigilance and nervous disturbance follow its use. It is not an uncommon practice with ardent students, when pushing their studies far into the night, to resist the claims of nature for rest, and keep themselves awake by the frequent use of tea. That it answers the purpose at the time cannot be denied, but the object is often attained at a fearful price, the destruction of health and the neglect of mind and body being the penalty. Less injury results in those cases from the use of coffee. There is this difference between the morbid states of the nervous system produced by coffee and those resulting from tea: that the former generally subsides or disappears on relinquishing its use; those from the latter are more permanent, and often incapable of being eradicated. Nevertheless many persons have immediately found their health improved by entirely relinquishing the use of tea, or even omitting it only at breakfast, for which meal it is not especially calculated. That it is a useful beverage. Those for whom tea is unsuitd will generally find weak cocoa the most proper substitute. Persons of a gouty and rheumatic nature, above all, those prone to calculi and those cases of the lithiasis disease, will find weak tea the least objectionable article of common drink. They should take it without sugar, and with very little milk. (Prout, On the Stomach, p. 217.) Where the water is hard, the addition of a little carbonate of soda not only improves it, but makes it a useful beverage for such persons. Tea should not be used till about four hours after any solid meal. The medical uses of tea are not many. In fevers it is not only an excellent diluent at the commencement, but a very justifiable article of diet in the acute stages of the disease. It aids the digestion. Mr. Brande, a spirit of sufficient strength for this purpose obtained at a cheap rate. The use of diseased heart tea proves a useful sedative. It is nearly as valuable an antidote to poisoning by opium as coffee is. Some cases of poisoning by arsenic and tartarized antimony have been prevented proving fatal by the immediate administration of tea in the form of a very strong infusion. Here its power as an antidote depends upon its tannin decomposing the poisonous substances. [Astringents.] But in poisoning by opium it is useful only in combating the secondary symptoms, and should not be administered till the tremor pump or other means have removed the opium from the stomach. (Lancet, 9th November, 1833.) Some cases of severe nervous headache are relieved by a cup of strong green-tea, taken without milk or sugar. But this should be sparingly resorted to; it is a wiser plan to avoid the causes of such headaches. Tea has been looked upon as the great remedy by which intoxication was to be banished, but it is certain that to relieve the tremblings and other unpleasant effects of opium, all alcoholic stimulants, or even alcohol itself, are of some use. A little alcoholic stimulant is occasionally added to the cup of tea, and so a habit is acquired which can never afterwards be relinquished. Tea has frequently been denounced as a useless article of diet, and the coffee-expresso has been declared to be devoid of nutriment, and the milk and sugar which are added supposed to be the only beneficial ingredients. Dr. Lettsom has given a calculation, partly his own, and partly taken from Essays on Husbandry," to show how much it is, in his view, unnecessarily expended by them in this way. But the observations of Liebig, if correct, and in all probability they are, do offer a satisfactory explanation of the cause of the great partiality of the poor not only for tea, but for coffee as well, and to some extent for brandy. We shall never cease to be able to trace to the practice of the tea-drinking nations the effects of the losses of the leaves of a certain shrub (tea), or of a decoction of certain roasted seeds (coffee). Some cause there must be which would explain the partiality of the nation that produces it, but we are not likely to discover the influence it has upon the family of nations. But it is still more remarkable that the beneficial effects of both plants on the health must be ascribed to one and the same substance, the addition of oxygen and the elements of water, can yield taurine, the nitrogenized compound peculiar to bile:

\[
\begin{align*}
\text{1 atom caffeine or theine} &= \text{C}_8 \text{N}_2 \text{H}_5 \text{O}_2 \\
\text{9 atoms water} &= \text{H}_9 \text{O}_9 \\
\text{2 atoms taurine} &= \text{C}_8 \text{N}_2 \text{H}_14 \text{O}_2 \\
\end{align*}
\]

To see how the action of caffeine, sapasparagus, theobromine, &c., may be explained, note that the chief constituent of the bile contains 3/8 per cent. of nitrogen, of which only the half, or 1/9 per cent., belongs to the taurine. Bile contains in its natural state water and solid matter, in the proportion of 90 parts by weight of the former to 10 parts by weight of the latter. The proportion of these is such that 2 parts of the solid matter in the bile may have more than 90 parts of water. The proportion of these parts by weight of solid matter to be choleic acid, with 3-67 per cent. of nitrogen, then 100 parts of fresh bile will contain 0-171 parts of nitrogen in the shape of taurine. Now, 2 parts of 0-2 per cent. of caffeine, or 2-4ths grains of caffeine can give an ounce of bile the nitrogen it contains in the form of taurine. If an infusion of tea contain no more than the 4th of a grain of caffeine, still, if it contribute in point of fact to the formation of bile, that action, even of such a minute, cannot be looked upon as a nullity. Neither can it be denied, that in the case of an excess of non-oxidized food and a deficiency of motion, which is requisite for the change of many of the substances, and thus to yield the nitrogenized product which enters into the composition of the bile; that in such a condition the health may be benefited by the use of compounds which are capable of supplying the place of the nitrogenized substance produced by the healthy exercise of the muscle of the stomach, to the produced of an essential to the production of an important element of respiration. In a chemical sense—and it is alone which the preceding remarks are intended to show—caffeine, or theine, sapasparagus, and theobromine, are, in virtue of their composition, better adapted to this purpose than all other nitrogenized vegetable principles. The action of these substances, in ordinary circumstances, is not obvious, but it unquestionably exists. Tea and coffee are among the most numerous whose diet is chiefly vegetable. (Liebig's Animal Chemistry, p. 178.) These facts show in what way tea proves to the poor a substitute for animal food, and why females and literary persons who take little exercise may have the greater partiality for it. They also explain why the attempts, and they have been numerous, to find among other plants a substitute for tea have invariably failed of success. The first tea-leaves were procured from the Chinese in exchange for those of the opium-politicians, or even the opium, which they, like others, soon found out its inferiority, and refused to part with their own precious leaf except in exchange for solid coin. The poor Chinese make use of the leaves of a fern, and also of those of the Saggaretis (Rhamnus) thesaceae; but to this their varico-cardiac is their correct use. Tea Trade.—The period when tea was first introduced into this country has already been noticed. How little it was possible at the time to have foreseen that it would one day become one of the most important articles of foreign production consumed in England. The first im.
The importation by the English East India Company took place in 1699 from the Company's factory at Bantam. The directors ordered their servants to 'send home by their ships one hundred pounds weight of the best tea they could get.' In 1678, as already noticed, 4713 lbs. were imported, but in the six following years the entire imports amounted to no more than 410 lbs. The continuous official accounts of the trade do not commence before 1725; but, according to Milburn (Oriental Commerce), the consumption in 1711 was 141,996 lbs.; 120,669 lbs. in 1715; and 227,904 lbs. in 1730. The following is a Table showing the Quantity of Tea retained for Consumption, and the Rate of Duty in each Year, from 1725 to 1834:—

<table>
<thead>
<tr>
<th>Year</th>
<th>lbs.</th>
<th>Customs Per Cent.</th>
<th>Rate</th>
<th>Rate of Duty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1725</td>
<td>370,323</td>
<td>13%. 13. 7.7d.</td>
<td>4s. per lb.</td>
<td></td>
</tr>
<tr>
<td>1726</td>
<td>360,377</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1727</td>
<td>468,868</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1728</td>
<td>543,021</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1729</td>
<td>696,367</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1730</td>
<td>810,110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1731</td>
<td>787,434</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1732</td>
<td>647,831</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1733</td>
<td>565,835</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1734</td>
<td>620,357</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1735</td>
<td>636,033</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1736</td>
<td>722,745</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1737</td>
<td>1,160,054</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1738</td>
<td>1,142,637</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1739</td>
<td>1,113,361</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1740</td>
<td>1,002,299</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1741</td>
<td>890,191</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1742</td>
<td>870,420</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1743</td>
<td>764,320</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1744</td>
<td>751,800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1745</td>
<td>730,729</td>
<td>1s. per lb. and 25 per cent. on the price.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1746</td>
<td>2,536,589</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1747</td>
<td>2,892,775</td>
<td>18%. 18. 7.7d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1748</td>
<td>2,483,811</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1749</td>
<td>2,798,807</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1750</td>
<td>2,564,338</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1751</td>
<td>2,774,809</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1752</td>
<td>2,976,626</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1753</td>
<td>3,131,885</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1754</td>
<td>3,447,017</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1755</td>
<td>3,556,146</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1756</td>
<td>3,729,333</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1757</td>
<td>3,961,799</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1758</td>
<td>4,205,394</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1759</td>
<td>3,507,744</td>
<td>20%. 18. 7.7d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1760</td>
<td>4,142,149</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1761</td>
<td>4,434,194</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1762</td>
<td>4,236,408</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1763</td>
<td>4,502,432</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1764</td>
<td>4,718,473</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1765</td>
<td>4,836,940</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1766</td>
<td>4,600,513</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1767</td>
<td>3,762,820</td>
<td>25 p. ct. on gross price.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1768</td>
<td>6,692,075</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1769</td>
<td>7,149,345</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1770</td>
<td>5,915,345</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1771</td>
<td>7,586,341</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1772</td>
<td>4,427,646</td>
<td>1s. a lb. and 25 p. ct. on the gross price.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1773</td>
<td>6,280,113</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1774</td>
<td>5,464,188</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1775</td>
<td>5,136,218</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1776</td>
<td>4,741,434</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1777</td>
<td>4,943,098</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1778</td>
<td>5,285,054</td>
<td>20%. 20. 6.6d.</td>
<td>5 per cent. additional on former duties.</td>
<td></td>
</tr>
<tr>
<td>1779</td>
<td>5,152,399</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1780</td>
<td>4,018,472</td>
<td>20%. 16%. 3d.</td>
<td>5 per cent. additional</td>
<td></td>
</tr>
<tr>
<td>1781</td>
<td>4,691,080</td>
<td>20%. 16%. 10d.</td>
<td>5 per cent. additional</td>
<td></td>
</tr>
<tr>
<td>1782</td>
<td>5,282,209</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1783</td>
<td>4,949,993</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1784</td>
<td>10,532,100</td>
<td>12%. Excise duty repealed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1785</td>
<td>12,536,399</td>
<td>5 p. ct. on gross 75% per cent. on gross price.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For above a century and a half the sole object of the East India Company's trade with China was to provide tax for the consumption of the United Kingdom. The Company enjoyed this trade to the exclusion of all other persons and was reserved from time to time to send orders for tea and to provide ships to import the same, and to have a year's consumption in their warehouses. The tea were disposed of in London, where only they could be imported at quarterly sales, and the Company was bound to sell them to the highest bidder, provided an advance of one penny per lb. was made on the price at which each
lot was put up, which price was determined by adding together the prime cost at Canton and the bare charges of freight, insurance, and all other charges on importation; but by the mode of calculating these items, and the heavier expenses which always attend every department of a trade monopoly, the upset prices were greatly enhanced. The prices realised at the Company's sales were however in some instances lower, and the upset prices, a result easily produced by a body who monopolized the sole supply, as it was only necessary that the quantity offered for sale should not be augmented in proportion to the growing demand for a rapidly increasing population. The 18 Geo. II., c. 26, passed immediately after a large reduction of the duty had taken place, provided for such a contingency as this, by enacting that if the East India Company failed to import a quantity sufficient to render the price of tea in Asia as in any part of Europe, it should be lawful to grant licences to other persons to import tea. This would have constituted a very efficient check if it had been acted upon; but eventually the mode of taxing the duty gave the government almost the same interest in a restricted supply as the East India Company, the duties being collected ad valorem on the amount realised at the Company's sales; and thus the very circumstance which enhanced the price raised the total amount of duty. The total of 90 cent. ad valorem, but being charged on a monopoly price, the difference on the cheaper teas consumed by the working and middle classes amounted to above 300 cent. per on the cost price of the same teas at Hamburg; and in 1824 there was a wide difference between the prices realised at 90 cent. ad valorem and the Hamburg prices amounted to a sum of 1,889,976. The sales in the last year of the East India Company's monopoly are shown in the following table:

An Account of the Quantity and Prices of Several sorts of Tea sold in England from May 1st, 1833, to May 1st, 1834:—

<table>
<thead>
<tr>
<th>Tea</th>
<th>lbs</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bohea</td>
<td>122,931,965</td>
<td>1 10</td>
</tr>
<tr>
<td>Congou</td>
<td>16,623,335</td>
<td>2 9</td>
</tr>
<tr>
<td>Camptoo</td>
<td>1,603</td>
<td>2 4</td>
</tr>
<tr>
<td>Souchong</td>
<td>354,515</td>
<td>2 9</td>
</tr>
<tr>
<td>Pekoe</td>
<td>514,811</td>
<td>2 10</td>
</tr>
<tr>
<td>Tawnkay</td>
<td>4,359,672</td>
<td>2 1</td>
</tr>
<tr>
<td>Hsien</td>
<td>141,610</td>
<td>2 2</td>
</tr>
<tr>
<td>Hyson</td>
<td>967,052</td>
<td>3 6</td>
</tr>
</tbody>
</table>

Total: 31,164,005

The Company's sales were in March, June, September, and December, the latter year being the largest. About 20,000,000 lbs. were offered belonging to the officers of the Company, who were allowed to import a certain quantity of tea on their own account. In 1833 there were only 122,931,965 lbs. of tea sold by the Company, and the change effected by the 3 & 4 Wm. IV., c. 63, which, on the 22nd of April, 1834, opened the trade to China, is now complete. The importation of tea is no longer confined to the port of London. In 1833 eighteen ships arrived inwards from China at different outports, tea of which were entered at Liverpool. In the four years ending 1834 the average annual number of ships entered inwards from China at the ports of the United Kingdom was 28, in the four following years the average was 68, and other commodities besides tea have been extensively imported, and a corresponding increase in the quantity and variety of the imports to China has taken place. The imports of tea from the United Kingdom, which formerly only required about 100,000 lbs. annually, amounted to 4,347,421 lbs. in 1841, and have averaged above three million lbs. a year since the opening of the trade, a fact which shows that prices here are no longer so much above those of the principal continental ports. The quantity received for consumption has also considerably increased, although accompanied by an extraordinary increase in the use of coffee.

The tea-duty produces about one-thirtieth of the total revenue; and only three articles, spirits, malt, and sugar, yield a larger revenue. But the tea-duty is not a great source of revenue, as it is the only one which is raised without the constitution. Since March, 1836, the tea-dealers have been relieved from the vexatious interference of the excise, the duty being collected entirely as an import duty by the officers of the Company. Previously, one of the hundred thousand tea-dealers in the United Kingdom were visited once a month by the officers of excise, who took an account of their stock; and no quantity exceeding four pounds could be sent from their premises without a permit, of which above 800,000 were required in 1835. In short, this system of supervision was very troublesome, costly, and answered no useful purpose. The number of tea-dealers in 1839 was 62,794 in England; 13,611 in Scotland; and 1,774 in Ireland. The tea is now sold by the importing merchants by public auction and private sale.

The following table shows the revenue which the tea duty has yielded in each year during the present century, and, to some extent, it is an index of the prices in each year:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Amount of Duty collected upon Tea in the United Kingdom in each year from 1800 to 1841 inclusive:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>£1,423,880</td>
</tr>
<tr>
<td>1802</td>
<td>£1,632,467</td>
</tr>
<tr>
<td>1803</td>
<td>£1,929,813</td>
</tr>
<tr>
<td>1804</td>
<td>£2,196,339</td>
</tr>
<tr>
<td>1805</td>
<td>£2,336,923</td>
</tr>
<tr>
<td>1806</td>
<td>£2,546,670</td>
</tr>
<tr>
<td>1807</td>
<td>£2,525,173</td>
</tr>
<tr>
<td>1808</td>
<td>£2,605,925</td>
</tr>
<tr>
<td>1809</td>
<td>£2,962,706</td>
</tr>
<tr>
<td>1810</td>
<td>£3,677,737</td>
</tr>
<tr>
<td>1811</td>
<td>£3,752,112</td>
</tr>
<tr>
<td>1812</td>
<td>£3,027,579</td>
</tr>
<tr>
<td>1813</td>
<td>£3,944,102</td>
</tr>
<tr>
<td>1814</td>
<td>£3,908,054</td>
</tr>
<tr>
<td>1815</td>
<td>£4,066,091</td>
</tr>
<tr>
<td>1816</td>
<td>£4,362,496</td>
</tr>
<tr>
<td>1817</td>
<td>£4,321,369</td>
</tr>
<tr>
<td>1818</td>
<td>£4,326,202</td>
</tr>
<tr>
<td>1819</td>
<td>£4,326,939</td>
</tr>
<tr>
<td>1820</td>
<td>£3,869,806</td>
</tr>
<tr>
<td>1821</td>
<td>£3,484,226</td>
</tr>
<tr>
<td>1822</td>
<td>£3,707,270</td>
</tr>
</tbody>
</table>

Between 1831 and 1841 the population increased 14 per cent., and the increase in the consumption of tea was 16 per cent. The prices of 1836, and the general prosperous condition of the country, rendered the period of 1840 a year in which the paid duty for consumption to nearly 50,000,000 lbs. In 1840 prices were about 25 per cent. higher, large classes of consumers were in a distressed state, and the consumption fell to 32,000,000 lbs. In 1841 the distress was still continued, but prices were lower, and the consumption rose to about 36,000,000 lbs. On the 5th of Jan., 1840, the stock of tea in London, Liverpool, Bristol, Glasgow, and Leith was 35,476,480 lbs.; and at the corresponding period in 1841 the quantity was 46,363,610 lbs. The proportion of black to green teas consumed in England is about 8 to 1; but in the United States the use of green tea is greatest. (Papers issued by the Chinese and East India Association; Part. Papers, &c.) The total export of tea from Canton to Europe and America exceeds 50,000,000 lbs. Russia is supplied with 6,500,000 lbs. via Kiatkhia; the United States of America require about 8,000,000 lbs.; France about 2,000,000 lbs.; and Holland imported about 2,000,000 lbs. The green tea districts are about 700 miles, and those where the black tea is made about 200 miles from Canton. The article is brought from Canton by land carriage, chiefly by porters and by the canals; and the number of tea merchants who resort to Canton is the custom. The trade is most active, that is, from October to March, is said to be about 700. The functions of the Hong merchants, through whom Europeans make their purchases, have been already explained. (Canton. The trade has not been interrupted in consequence of the present dispute between England and China, nor is it likely to be, as it is one of the greatest importance to the Chinese; and whenever, in former disputes, it has been temporarily suspended, no difficulty has occurred in obtaining the usual supply through the traders of other nations at Canton.)
THEATINS, or TRATINS, an order of monks founded at Rome in 1524, principally by Gianpietro Caraffa, who was then archbishop of Chieti, in Naples, the Latin name of which is Teate, and who afterwards became pope under the title of Paul IV. Their institution was confirmed at the end of the sixteenth century by the reigning pope, Clement VII.; and a final rule, or code of regulations, drawn up by a general chapter of the order, was authorised by Cle-

ment VIII. in 1550. The Theatins were principally established in Italy, and adjoined to it by Portugal, where they subsisted till the Revolution of 1789, when they were brought in 1644 by Cardinal Mazarin, who bought them. Their house at Paris, near the Louvre, and at his death left them 800,000 crowns, partly by the sale of the building, the most of whose dress was a black cloak and cassock with white sleeves; and the principal peculiarity of their institution was that they affected to守住 not only upon alms, but upon alms bestowed upon them without being asked for. They procured, however, considerable support in this way, and they were at one time enabled to maintain missions in Georgia, Circassia, Mingrelia, and other parts of Asia. Their history has been written by John Baptist Tuffin, under the title of 'Annales Theatinorum.' There were also Theatin nuns (in French, Theatines), so called from having been placed by Pope Gregory XV. under the direction of the Theatin monks, their original and proper designation having been Sisters of the Immaculate Con-

ception. They were divided into two orders, of which: 1. the one called the convents of the Congregation, founded at Naples by Ursula Benincasa in 1553; the other, of later institution, called Theatin Nuns of the Hermitage. The latter were bound by vows of peculiar solemnity and strict-

ness, and provided for and by their own charity and work. They were two societies however intimately con-

nected; their houses adjoined and communicated with one another, and the temporal concerns of those of the Hermitage were managed by those of the Congregation. In 1654 Urban VIII. added these nuns from the jurisdic-
tion or superstition of the Theatin monks, and placed them under that of the Neapolitan nuncio; but the former state of things was restored by Gregory IX. in 1656. A notice of a conversation between the Pope and the Jesuits, which was kept up for a great part of the seventeenth century, is given by Bayle, in a note to his article on 'Ignatius Loyola.'

THEATRE (from the Latin theatrum, which is from the Greek theatroú, 'a place for seeing'), a word adopted in all modern languages to signify a building appropriated to dramatic representations. The oldest edifices of this class are those of the Greeks and Romans, for it was with them that the European dramas originated, and, in point of magni-
tude and splendour, the most of them rivaled their temples; while the most of them remains of such edifices, which have been explored not only in Italy, but also in Asia Minor. Some of them indeed little now can be traced, but others are sufficiently perfect to convey a clear idea of the ar-

rangement and general appearance of the structure in its original state; that is, however, merely as regards the space appropriated to the spectators, for scarcely anything re-
mains to explain what is most difficult, and, as regards the dramatic exhibitions, most important of all to understand, namely, the stage itself, including under that term the whole space of the theatre, and the arrangement of the perfor-

mance and for the preparation of the exhibition before the audience. Owing to the want of any evidence of the kind afforded by the buildings themselves, and to the very little that can now be gathered from the scanty notices of ancient writers, we are ignorant of many things which can only be conjectured.

The very circumstances that are mentioned for our ad-

mission, and in proof of the magnificence and sumptuous-

tude of the productions of ancient theatres, also prove how desti-
tute of anything approaching to modern theatrical decoration and effect the performances must have been. Whether it be at all exaggerated or not, it is evident from what Pliny (Nat. Hist., xxxvi., c. 15) says of the theatre of Scævula at Romanum, that the whole scene, as well as the sculptured facade, un-

meaning in itself, though lavishly embellished with columns and statues, with no fewer than 360 of the former, arranged in three tiers, and 3000 of the latter, a most incred-

ible number, surpassing that of a modern audience; for it

is difficult to conceive how they could all have possibly been introduced. Pliny puzzles us still more when he says that the middle of the scene (meaning the second of the three orders) was of glass. Without stopping to inquire whether this can be meant by 'glass,' perhaps mosaic, we may remark, that a background to the stage could have been no better than an extravagant absurdity, and that the actors must have appeared mere pilgrims upon a stage of such enormous ex-

tent, a number of statues behind them. This must always have been in some degree the case, since even at moderate-sized antient theatres the stage was enormously wide in comparison with what it is in the very largest mod-

tern theatres. The scene too was always a permanent contrivance: it was, in fact, a whole system of scenery, having no reference to the particular performance, it must frequently have been at variance with it. It has been sup-

posed that, besides the permanent scene, the antients em-

ployed, occasionally at least, moveable painted screens, capable of being let down, and it may be only very vaguely inferred, the presumption against it being founded both on its impracticability and its extreme im-

probability. How is it possible to have had painted move-

able scenes on canvas, which, if the width of the stage has been 200 feet in width, especially where the stage itself was so shallow and confined at its sides, and without any space for apparatus or machinery over it? If again there was any such scenery, it would have given rise to a breach of decorum to have been let down while the spectators were watching it. A moderate proficiency in linear and aerial perspective, in regard to both of which the antients appear to have been deficient. If we may judge from those specimens of their pantomime, which have come down to us, and see them set out to have aimed at general picturesque effect, rather than at the purely dramatic effect of mere representation alone, without any scenic background to them. If, too, there had been anything re-

sembling our modern scenery, more explicit mention would probably have been made of it, if only on account of the enormous magnitude of such paintings, whose services must sometimes have contained a much greater number of square feet than the sides of the largest temples. Viru-

vius does indeed make mention, in the proem to his seventh book, of Agatharchus of Smyrna, and of Damocles and Anaxagoras as writers on scenography and perspec-

tive; but it is with his usual dryness and obscurity, and with such vagueness of expression, that it is difficult to draw any conclusion from his words. Of the former be

lieves that there was nothing more noble in the theatre than that he was one of the first who introduced some sort of decoration on the scene, or back wall of the stage, where, if there was at any time painting at all, it could only have been on a very small degree, perhaps in the general facade,—perhaps in such pieces as the 'Phile-

tete's' something was done to give to the centre doorway of the scene the appearance of an entrance to a cavern,—

just sufficient to indicate the locality intended to be ex-

pressed. The fixed arrangement of the scenic itself, with three distinct entrances assigned to the performers accord-

ing to their rank in the piece, the centre one being for the principal characters, the others for those supposed to arrive on one side from the port, on the other from the country, as it was seen to be some sort of entrance to itself, but an expedient which shows how imperfect the antient stage must have been, how destitute of all con-

trivance, notwithstanding its alleged magnificence. What there was of painted scenery all must have been com-

piled entirely to two Versurus (supple) at the sides or ends of the stage, which served as 'wings,' and which were

upright triangular frames made to revolve upon a central pivot, so that any of the three sides could be turned aside: the 'wings' and the 'acting stage' thus being at best, and exceedingly limited in effect, it being no more than sufficient to hint where the action was supposed to take place; whereas the scene itself bore no more resen-
tance to the intended locality of the piece, than do the two great side-walls of an opera bouffe, where the stage itself is where the latter are sometimes made use of by the per-

formers.

From the use of the term Antena it has been generally
concluded that the whole stage was concealed by a curtain both previous to the commencement of the performance and whenever it was requisite to make any change in the decorations. But we agree with Winckelmann, that such could not possibly have been the case, because in the first place it could hardly have been practicable, and in the next it was quite unnecessary as regarded the permanent scene or architectural façade. Whatever changes, says that writer, were made at all could have been only in the side-scenes or versatura, and it was merely before them that the curtain was drawn at such times; which circumstance says nothing in favour of what little stage machinery there was. The notion of there being painted moveable scenes like ours, capable of being let down or drawn up, is completely confuted not only by one, but by every circumstance that can be mentioned.

Admitting the possibility of having scenes of such prodigious size, how are we to reconcile with the use of them the bestowing so much decoration upon the scenes, or wall at the back of the stage, behind them?—to what purpose would have been the entrances through that wall, for the performers to come upon the stage, if there had been a separate painted scene before it? The stage itself again was so exceedingly shallow, that it would hardly have been possible to be further concealed in depth, by other scenes being let down before the permanent one; nor would there have been space for them and the versatura also. There would also have been more explicit mention made of such scenery, or its use, and there would have been some particular term to distinguish them from what is now called the scene, if they had ever been used. What Vitruvius says upon the subject of stage decoration is not only very brief, but exceedingly obscure, and only proves his carelessness in omitting to describe or even mention much that is of real importance, while he goes altogether out of his way to give us a chapter De Harmonica, and to speak of many matters that have no connection whatever with theatres as a distinct class of buildings.

Even admitting that there was painted scenery, and that it was not at all inferior to that of our own theatres either in regard to truth of perspective or anything else, it still must have fallen very short of the latter in effect, if only for the reason that the performances took place by daylight. At the best the illusion could have been but exceedingly imperfect—a strange mixture of the artificial with the real; and even what degree of effect there else might have been, must have been more or less counteracted by the sun shining on some part of the stage and scene, while shadows would be thrown upon them, in others, by the wall at either end or side. Or if the stage itself was at any time roofed in, all the upper part of the scene must have been thrown into shadow. The natural lights and shadows and the painted ones must frequently have been in strange contradiction to each other; nor was it possible to manage any effects of light, as in our theatres, by either increasing or diminishing it, or by concentrating it on any particular part of the scenery. The only thing in favour of the antient stage in this respect, is that there were no 'foot-lights,' and consequently the faces of the performers were not lighted from beneath. Yet even this comparatively unimportant advantage was nullified by the use of masks, some of them so extravagantly grotesque as to bear scarcely any resemblance to the human countenance. The most natural masks were in some degree distorted, and a fixed expression of countenance was substituted for what could properly be only a momentary one. Hence one great excellence in acting was entirely suppressed: the face was as rigidly innanimate as in wax-work. It is true this was of no very great consequence, because, owing to the vast extent of the theatres, the figures drawn at the side, the actors could hardly have been distinctly seen, or seen at all by the great majority of the spectators, more especially as such aids to vision as opera-glasses were then unknown. The whole space was so great, that in regard to it the actors could have been no more than as the figures put by a painter into a landscape. Neither does what is said as to their colurnn, or thicksoled buskins, being intended to make the actors appear taller, give us any very high

ides of the effect so produced; for while the increase of stature could have been scarcely perceptible—or if it had, it would have caused the limbs to appear strangely disproportioned—the means employed for it were ill calculated to give ease and gracefulness to the performer's movements.

On considering the audience part, and the accommodation provided for the spectators, although there the arrangement of an antient theatre was nearly perfect, and in some respects preferable to that of modern ones, it was not free from many inconveniences. The most obvious one is, that as there was no roof, there was no shelter from the weather, on which account sawings were sometimes made use of to screen from the heat of the sun, while in case of sudden and heavy rain the spectators were obliged to take shelter in the corridors behind and beneath the seats, where there were any, and in the porticoes at the back of the theatre. Besides interruption to the performance, this must have occasioned considerable confusion in so numerous an assemblage of persons. Beautiful too as the arrangement of all the seats in concentric rows is in itself, it is attended with some disadvantage, as will be perceived on referring to the annexed plans, for instead of being placed, as in the pit of a modern theatre, parallel to and immediately facing the stage, a considerable portion of the audience must have sat sideways to it, with part of it behind them; and those at the ends of the further or upper benches could hardly have had any view of the scene at all, at least not in the Greek theatre.

The Greek and Roman theatres so very nearly resemble each other in their general form and principal parts, that it is only by comparing the plans, for the purpose of seeing wherein they vary, that the difference between them can be clearly understood. Such difference however is ex-
seemingly slight, the general arrangement and the essential parts being the same in both,—the Operum (Odeion), Orchestræ (Oxygynæ), and Scena (Scenæ) in the one, and the Cavea, Orchestræ, and Scena in the other. The cavea was the general term for the whole of the space appropriated to the seats of the spectators, which were all concentric with the orchestra; and which were intersected in one direction, by ascents or flights of steps (Εὑρικαί) dividing the seats into so many compartments, termed ἀκριβή, or Cunei, and separated into two or more 'flights' or 'tiers' by broader spaces or landing-places, called ἐπίστροφον or Πραξικαίν. The number of the Cunei, or ascents, and that of the Πραξικαί, or Precincts, and also the breadth of the latter, have been regulated entirely according to the extent of the theatre and other circumstances; so that it had to be seen whether there was one Precinct between the seats, dividing them into two 'flights,' not however so as to give an equal number of rows of seats to each. In the theatre near Epidaurus, for instance, there were 54 rows of seats, divided by a single Precinct, and 34 of them formed the first or lowest tier nearest the orchestra; while in that at Syracuse there were 62 rows, with only a single Precinct between them, and 41 were given to the second or upper flight, furthest from the orchestra. In the theatre at Drarnysus, again, the number of Precincts, or divisions, of the nave between rows, was 18, 10, and 20 respectively, reckoning from the orchestra. As regards the distinct 'flights,' or series of seats, there were two modes of disposing them: the one was to break the separate slope tiring from each other, like the 'flights' in an ascent of steps; the other was to place them in a continued slope from the lowest to the highest seats, whereby at each precin- cion the next 'flight' was considerably elevated above the preceding, being placed upon a lower wall, which showed itself between the lower and upper 'flight.' Besides the precincions between the seats, there was another surrounding the whole coelum, or auditory of the theatre, forming either an upper uncovered terrace as a scene for the actors or spectators, or else a series of columns, as is shown in the plan of the Roman theatre, where such portico was assigned to females.

Between the Grecian and Roman theatres there was a very wide difference as regards the purpose to which that space was appropriated. In the Roman theatre it was merely a continuation of the rest of the auditory, being occupied with seats and spectators, with no other difference than that the spectators were senators and other persons of rank, and that because of the concave and hemicycles must have been arranged parallel to the stage. The Greek orchestra, on the contrary, was, as its name imports, made use of for the dancers, musicians, and singers, whose performances constituted so important a part of the entertainment; and so far the arrange- ments of the theatre, for the orchestra was visible from every part, whereas the scena could not have been distinctly seen, or hardly seen at all by those on the upper seats at either extremity of the coelum. By referring to the plans it will be seen that while the Roman orchestra does not exceed half a circle, the Greek forms three-fifths of one, or an arc of 216 degrees, its proportions and the depth of the stage being ascertained by merely inscribing a square within a circle, taking one side of this square as the boundary of the stage, and drawing parallel to it a tangent to the circle, which tangent coincides with the scena or back of the stage. Such plan therefore is simple enough, complex as it may appear in the cut, where two other squares are also drawn with this end in view, and the points on which I examine how far the seats extend, and the situation of the steps (Εὑρικαί) between the seats,—a fanciful operation, nothing more being required after the first one than to divide the arc of the orchestra, and the number of steps into as many equal parts as would be requisite according to the number of ascents. In fact this last appears to have been the mode practised, for there are as many examples which differ from as agree with that established by Vitruvius for the Greek theatre. Again, the divisions, the number of steps, and the number of steps between them, would be uniformly the same, viz. seven of the former, and eight of the latter, including those next the stage, as shown in the cut. This however is so far from being the case, that very material differences occur in that respect. At Epidaurus, for instance, there are ten cunei in the lower tier, and eleven ascents, consequently an even number of the former and an odd one of the last. At Drarnysus again there are nine cunei and ten seats, and at Syracuse and Tauromenium the same. The Roman orchestra and scena were also defined by a circle, viz. which was inscribed an equilateral triangle, one of whose sides D D formed the scena, while the diameter H H of the circle, parallel to the side D D, was the theatre, the breadth of which was one quarter of that diameter. Nothing more is requisite than to divide the semicircle of the orchestra into as many equal parts as there are in one cunei, whether the number be six or any other; and the diameter of the orchestra D D being given, the distance of the seats from the scena Scena will be directly as one-fourth of that line. After all, as has been remarked by Wettjer in his work on theatres, there is something so whimsical than rational in such an arrangement. What advantage is it, or what particular harmony of parts is produced by the front of scenes exactly coinciding with the base of an equilateral triangle inscribed within a circle of which only one-half is visible, while the triangle itself is not visible at all? These arbitrary architectural fancies were rather defects, and they show how imperfect the art of scene design was. The Grecian theatres already pointed out, as regards the grandeur of scenic scenery, it was no slight inconvenience that the stage could never be occasionally extended in depth, shallow as it was. The Roman theatres, in which dimensions are equal to the whole of the largest of our modern theatres, the depth of the stage in a Greek theatre would be a little more than 10 feet, or one-seventh of that diameter; and in a Roman one 175 feet, or one-fourth of the diameter. It may be, therefore, that in respect of very little dramatic action, it would scarcely admit of any change of scenery. Yet shallowness of the stage was in some measure matter of necessity, that the performers might be as near to the front of the stage as possible. In these they gathered, and seeing at least from the audience by the intervening orchestra.

Strict as were the rules for proportioning the depth of the stage to the size of the orchestra, the relative size of the orchestra to the coelum or whole auditory does not appear to have been subject to any regulations: it varies considerably in different theatres, being in some nearly one-half, in others only one-fifth, or even little more than one-sixth of the entire diameter of the interior, as is the case with the theatre of Epidaurus with an orchestra of 180 seats. When it is said that the Grecian orchestra was considerably larger than the Roman, there is some latitude in the expression, for it might be inferred from it that it was larger than the other in proportion to the whole theatre; while it is certainly much smaller than the whole theatre. The Romans formed a larger portion of a circle, extending to 220 degrees, while the Roman was only 180 degrees, or one-seventh of a semicircle. In the Greek theatre, therefore, the orchestra cuts into the stage, and renders that part termed logeion by the Greeks, and Pulpitum by the Romans, comparatively narrower than the extremities, whereas in the Roman theatre the stage was of the same depth throughout, the pulpum being a mere technical distinction applied to the theatre of Epidaurus with an orchestra of 100 seats, auditory 270, seats 110, depth of stage and pulpitum 25.

Another point of difference between the Grecian and Roman theatres is, that in the former the stage was confined * The auditea also were obliged to have recourse to what seems a very expensive for transmitting the vocal force to the furthest part of the house. Strabo (lib. xii. p. 732) says, "the audience is situated in ellipses or ovals for the sake of the metal or earthen vases, termed ecchei (γγρεί), that is sounding vessels, which augmented the sound. Mr. W. Rusten describes the theatre of Syrakus being in the theatre of Syrakus in Sicily, but what about what metal or earthen vases, the acoustic effect was by the audience actually possible now or in 1815.
ably elevated above the orchestra, 12 feet or upwards, consequently there was a wall of that height at the back of the orchestra, to which was given the name of Hypomomus, and which formed a sort of architectural basement to the stage, and was adorned with niches and statues. This however is little more than conjectural, for what is known relative to this and other teatrical parts of the stage is derived not from any examples of them discovered in antiquity, but merely from such mention of the terms applied to them as is found in a few ancient writers and commentators, whose explanations are all more or less obscure, and which we shall not therefore attempt to say more relative to either the Greek or Roman stage and scenery than we have already done. It seems to have been assumed that, because the theatres themselves were of extraordinary extent and solidity in their construction—that is, there were columns, and marble, and stonework—the stage exhibitions also must have been in the same degree superior to those in the comparatively small theatres of modern times. Yet the truth is, that capacious as the buildings were, and intended to accommodate nearly the entire population of a city at each performance, the stage itself was not at all in proportion to the rest. There was so little space attached to it either behind or at its sides, that the scenic and scenic contrivance and effect must have been limited; and it is impossible to read that 'not unfrequently a magnificent compilation of machinery gradually descended with the divinities of Olympia,' though we do not doubt the fact of there being some contrivance for letting down performers from above—in which case however, the stage must have been steeply roofed in—we generally question the 'magnificence,' and rather suspect that the contrivance must have been somewhat clumsy, and the effect almost ridiculous.

A experiment has lately been made (November, 1841) in the theatre of the new place at Pothdadam, towards reviving an ancient dramatic performance, with rigorous attention to costuming. The piece selected for the purpose was the 'Antigone' of Sophocles, and the theatre and all the model was consequently made to conform as nearly as possible to classical example. The pit was converted into an orchestra upon the Grecian model, and it was here that the persons who composed the chorus remained until they had to appear on the stage, when they ascended to it in the midst of the audience, and descended again in the same manner, so carefully was all the ancient practice observed. Equal regard to precedent was shown in comparatively trifling matters: for instance, instead of the curtain being drawn up, it was let down, as was supposed to have been the case in the ancient theatre, a circumstance which has already been questioned by us; and it is said that the effect of the upper part of the scene being disclosed before the lower was not a little striking. Indeed, we may believe that the change in journals have reported of the classical exhibition, it perfectly realized its purpose, and so much as to doubt greatly surpassed it, if it were only because it took place by candle-light, and the actors did not wear masks.

Little more remains to be said on the subject of ancient theatres, except to remark that the form of the orchestra also determined that of the exterior of the building; while the Roman theatres therefore did not exceed a semicircle, those of Greece had a greater curve. In the Greek theatres however the orchestra was not always extended beyond a semi-circle, but terminated by a circle of seats built by straight lines at right angles to the chord (or parallel to BB, in the plan of the Roman theatre, whose general form is so shaped, the external semicircle being prolonged by the colonnades). Grecian theatres were almost invariably built on the sloping side of a hill, so that the seats and the colour, it was merely necessary to shape it out and erect the seats; consequently there was no other architectural exterior than that formed by the Parospan (Parospan) and colonnade, by the curve being confined, but sometimes the degree of curvature did not manifest itself. The Roman theatres, on the contrary, were erected on level ground, and therefore the curved part of the exterior was confined to a semicircle, a form which unites both with the rectangular line and the curve of the hill, and which for the sake of simplicity of construction is almost necessary in such a case. The theatre at Athens (called that of Bucephalus) was by no means so spacious as many others, its diameter being only 250 feet, and that of the orchestra 72, which are very moderate dimensions in comparison with those of some of the Asiatic theatres. The Odeion of Regilla, also at Athens, though similar in its general plan to the usual theatre, was a music-hall, and was covered in with a tent-like roof, with a semicircular eye or opening for light. Both structures were situated on high ground, the Odeion on the east side of the south of the Acropolis (Athens, Plan); therefore the scene of the theatre had a northern aspect, and must have been in shadow while the performances took place in the open air.

The following is a list of such antient theatres as are known, together with the respective dimensions of their general diameter and of their orchestra; which we have for the most part taken upon the authority of a similar table given by Col. Leake, in his 'Tour in Asia Minor,' to which several other examples are here added.

<table>
<thead>
<tr>
<th>Theatre</th>
<th>Diameter</th>
<th>Seats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athens, Theatre of Bacchus</td>
<td>250 ft.</td>
<td>72 ft.</td>
</tr>
<tr>
<td>Odeion</td>
<td>90</td>
<td>30</td>
</tr>
<tr>
<td>Crinus</td>
<td>400</td>
<td>25 rows of seats</td>
</tr>
<tr>
<td>Delos</td>
<td>175</td>
<td></td>
</tr>
<tr>
<td>Dramysus, or Joanna</td>
<td>440</td>
<td>78</td>
</tr>
<tr>
<td>Ephesus</td>
<td>660</td>
<td>240</td>
</tr>
<tr>
<td>Epidaurus</td>
<td>370</td>
<td>57</td>
</tr>
<tr>
<td>Heracleum (Hercules)</td>
<td>190</td>
<td>16 rows of seats</td>
</tr>
<tr>
<td>Hierapolis</td>
<td>346</td>
<td>100</td>
</tr>
<tr>
<td>Laodicea, Great Theatre</td>
<td>364</td>
<td>136</td>
</tr>
<tr>
<td>Limyra</td>
<td>195</td>
<td>not known</td>
</tr>
<tr>
<td>Mantinea</td>
<td>227</td>
<td>not known</td>
</tr>
<tr>
<td>Miletus</td>
<td>472</td>
<td>22</td>
</tr>
<tr>
<td>Myra</td>
<td>360</td>
<td>120</td>
</tr>
<tr>
<td>Nicopolis (in Epirus)</td>
<td>360</td>
<td>120</td>
</tr>
<tr>
<td>Orange (scene only remaining, 386 ft. wide, 114 ft. high.)</td>
<td>265</td>
<td>96</td>
</tr>
<tr>
<td>Patara</td>
<td>20 rows of seats</td>
<td></td>
</tr>
<tr>
<td>Perga</td>
<td>250</td>
<td>68</td>
</tr>
<tr>
<td>Phyllus</td>
<td>400</td>
<td>Scena 150</td>
</tr>
<tr>
<td>Pola, about</td>
<td>230</td>
<td>68</td>
</tr>
<tr>
<td>Pergamum</td>
<td>1638, but plan preserved by Scamozzi</td>
<td></td>
</tr>
<tr>
<td>Pompeii</td>
<td>190</td>
<td>62</td>
</tr>
<tr>
<td>Pompeiopolis</td>
<td>219</td>
<td>138</td>
</tr>
<tr>
<td>Rome, theatre Marcellus</td>
<td>517</td>
<td>172</td>
</tr>
<tr>
<td>Sardes</td>
<td>352</td>
<td>162</td>
</tr>
<tr>
<td>Selinus (in Cilicia)</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>Siclyon</td>
<td>313</td>
<td>100</td>
</tr>
<tr>
<td>Side</td>
<td>390</td>
<td>120</td>
</tr>
<tr>
<td>Sparta</td>
<td>143</td>
<td>217</td>
</tr>
<tr>
<td>Sparta</td>
<td>453</td>
<td>217</td>
</tr>
<tr>
<td>Syracuse</td>
<td>359</td>
<td>106</td>
</tr>
<tr>
<td>Tauroctonium</td>
<td>440</td>
<td>330 width of scene 132</td>
</tr>
<tr>
<td>Teos</td>
<td>265</td>
<td>70</td>
</tr>
<tr>
<td>Tralles</td>
<td>54</td>
<td>138</td>
</tr>
</tbody>
</table>

Of some of these theatres scarcely anything remains, little more than their general shape and extent being now distinguishable; accordingly the statements of their dimensions are not to be strictly relied upon, though they are sufficient to enable us to estimate their comparative size. Fortunately the ancient theatre was not taken as a model for modern structures of the kind. The revival of theatrical representations took place before anything was known relative to that branch of architectural archaeology, and under very different circumstances. Dramatic entertainments were then either partly religious, and performed within churches, convents, and colleges; or were acted for the amusement of princes and nobles on occasions of state and festivity, in halls merely temporarily fitted up for that purpose; consequently that is a permanent structure, as public theatres, were not required until long afterwards, when the drama had become a distinct profession. In the meanwhile a taste for scenic display had developed itself, which required a very different arrangement of the stage. Of the others Baldiarena Peruzzi (Perruzzi), whose skill in architecture and perspective carried scene-painting almost to perfection at once. Even in the preceding century dramatic exhibitions had been produced at Florence in a style then unprecedented; and we are told that the first Italian theatre.
was one erected in that city by Bernardo Buontalenti in 1581; but it does not appear to have been a public theatre, nor does it seem to have been very splendid, as it now forms merely a saloon in the building called the Ufizzi. Theatres on the present system were not built until the early part of the seventeenth century: just before which time an attempt was made to restore to the antient theatre and stage, with the permanent architectural scene and its entrances, by Palladio, whose celebrated Teatro Olimpico at Vicenza is one of those things which have gained a traditional reputation far beyond their real value. According to him, it was built with the idea of anything of the kind, it has continued to be admired since, partly on account of the character attached to it, which far few care to dispute; and partly perhaps on account of its singularity, and because there is nothing else like it. By no means however is it a very accurate imitation, though its chief merit lies in being a mere imitation; it is semi-elliptical instead of circular, with the stage on the longer axis of the ellipse; wherefore it looks too much squeezed up one way, and stretches out the other, and produces the same kind of disagreeable effect as would arise from placing the stage on the longer side of a parallelogram of the same extent (96 × 45 feet). It is said that the space to which the architect restricted the theatre and stage was a compromise, but he has hit upon it yet hardly as it appears so from the published plans of the building, for it would not be difficult to show how a semi-circle might have been brought in. With regard to the scene, for which unlimited admiration is justly due to Palladio, it is not an unqualified success: it stands in almost as many architectural barbarisms and solecisms as could well be brought together. Even Robert Adam spoke of it as mere ‘gibberish,’ and another architect, Woods, says, ‘The scene, which is the part most admired, borders on absurdity,’ and that although the building was too celebrated to be omitted, for him it might have slept in oblivion. It is not however so much the scene or facciata itself, as the avenues seen beyond it through the central arch and other openings which attract notice, and have been extolled by some as greatly superior to the ‘flimsy’ painted decorations upon canvas used in modern theatres. Those avenues represent as many streets, the fronts of the buildings being modelled or carved in relief, and attempted to be shown in perspective by the floor and ceiling sloping very much upwards and downwards, and the other horizontal lines accordingly, and by the passages themselves being narrower at the further end. The contrivance is puerile at the best; and instead of being more decorative, as it might be, the complete perspective becomes distorted when viewed from any other situation than the centre of the theatre and the level of the stage. It is also difficult to understand how these narrow entrances could have been used for a considerable time of a performance; and although they are, in stage language, ‘practicable,’ hardly could they have been made use of, at least not for their whole extent, because at their further end an actor would appear gigantic. This structure is nevertheless entitled to notice as an example of a very defective and faulty system, and because it has been frequently mentioned for the purpose of recommending, on the imposing authority of the name of Palladio, what ought not to be imitated.

We are not aware of more than one other attempt to revive the antient theatre in all its strictness, which was that built in 1888 at Sabbionetta, for the Duke Vespasiano Gonzaga, by Scamozzi, who completed the Teatro Olimpico at Vicenza. The arrangement of the structure, speaks of it as then no longer remaining; but Tiraboschi points this out as a mistake, saying that the building still existed, though very much out of repair. How far the theatre at Sabbionetta differed from that at Vicenza in size, Temanza has not stated. It was, however, superior to the latter in its plan, the spectator being semi-circular, and the orchestra somewhat more. There was likewise, as at Vicenza, a Corinthian loggia or colonnade around the edifice, and 36 seats, but it is obvious that it contains much better than the Teatro Olimpico; the whole intercolumnium is closed. Yet whatever improvement Scamozzi may have made upon his predecessor's work, he attempted to do.where it is most of all wanted, but copied the permanent scene, with its avenues of mock perspective in relief. We do not say that the antient theatre offers nothing for imitation, or capable of being applied to modern ones. On the contrary, the general form of the spectatorial is the most elegant and commodious that can be devised; the abnormally large in adopting, together with that, the antient scene and stage, than which nothing can be more ill-conceived. Yet in the fact that the antient model supplies no stage at all in comparison with what is now required for one, but merely a proscenium; and such an antient scene, with merely a stationary architectural "drop" (Breccia Romana), there are more interesting representations, just as well as the Logeion of the Greeks, the Pulpitum of the Romans, and Palladio's classical architectural background, which will not endure the slightest comparison with the drop-scene at the Commedia dell’arte, with all the modern stage, with its extensive and complex scenery and mechanism, should be combined with the form and arrangement of the antient spectatorial, though not without very considerable modification. That was done by Quast and improved. The Hermitage at St. Petersburg; in another private theatre in Prince Besborodko's palace, and in a design for a public theatre intended to be erected at Bensaco. After all, such plan and disposition of the seats are by no means necessary, and even in ancient times it was a matter of opinion: unless many inconveniences were to be submitted to, great loss of space, or what would be considered worse, would be incurred, and the number of spectators would be much less in proportion to the width of the stage and the vast extent of the auditorium. The stage may be applied to a concert-room with such very slight alteration, that it is rather surprising it should not have been taken as a model for public rooms of the kind. Then permanent scenes, either of the sort of the antients or singers, would be appropriate, because not intended to have any immediate reference to the performance itself.

In claiming a decided superiority for the modern theatre over the old, we speak only as regards the respective systems; and as Ugoni, in his Life of Milizia, observes, to prefer the Grecian theatre, with all its inconveniences and the awkward expedients resorted to in it, as being more classical and dignified character than our own comparatively small and fragile yet greatly improved "trusses" of the kind, is to wish to limit art and science within their first bounds. There certainly was good reason at one time for claiming against modern theatrical architects as very defective in regard to the audience portion of the "house." Till within a comparatively late period, scene-rat any study was bestowed on beauty and convenience of plan. The accommodations were hardly so good as those in many very ordinary playhouses, where for want of anything better were simply borrowed from the antient theatre. The 'house' was usually an oblong, either rectangular or elliptical, so that the greater part of the audience,—at least those in the boxes,—were placed quite on the sides. Where the 'house' contrived towards the perspective, as was frequently the case, the audience actually turned from the stage; and whether such was the case or not, they were allowed to encroach upon the stage itself in such manner, that when the actors advanced to the front of the stage or beyond the line of the curtsey, they may be said to have mingled with the audience, and those in the boxes on the antient-scene were actually behind them. If we may judge from the plans and the drawings of the same two principal theatres in London, it is plain that the whole stage was contracted, and as ugly as can well be imagined. The approach too, used formerly to be exceedingly bad: not only mean and inconvenient, but in many places most dangerous; and as ugly and as narrow. Such is strikingly the case in most of the existing English theatres, where there is still room for further improvements, obvious, though not likely to be adopted so long as it is considered a matter of course that the space before the curtain must be made to contain as many persons as can possibly be packed in without injury. We speak here of the stage, but there is a whole house to the ceiling. We do not say that modern theatres are too lofty; the error does not lie there,

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but in carrying up the boxes, tier after tier, to such a precipitous height that the uppermost box is several feet above the second tier, the following facts will be found: the box seats of the upper-gallery are actually on a level with the ceiling over the pit. Such accumulation of diminutive stories gives a crowded appearance to the whole, and leaves no scope for architectural decoration around the upper part. No, indeed; its dimensions, as a whole, and the different kind presents itself from the pit and from the stage, when the house is entirely filled to the very top; and if we consider merely the coup-d'oeil from such points, it is impossible to avoid comparing. But then, as regards that part of the audience who occupy the boxes on the side facing the house, the arrangement is bad. From the seats which are at all above the level of the top of the curtain, there is only a bird's-eye view of the stage and the scenery, and that from the middle tiers of boxes on the side, or for those on the side of it is impossible at that height to obtain a sight of the scene or even the actors, unless when they come forward towards the foot-lights.

It should not be said at a greater height than midway that of the curtain, or the level of what is now the second tier of boxes in our large theatres; for, as the scenery can be painted only to one horizon,—generally that of the stage itself,—its perspective effect is more or less impaired when it is seen from so great a height above that level. No less precipitous is the practice of continuing the sides-boxes up to the prosenium, and sometimes (as in the Opera-house at London) quite up to the very curtain, so that there is no prosenium at all, unless the spectators are at the foot-lights; it is impossible that any difference of opinion as to its being the best form in regard to hearing. In fact, the science of acoustics is not yet brought to exactness as regards practical purposes in building; it is the principal difficulty of the matter that much of the stage will be visible from different parts of the theatre, but not so what will be the result as to sound, since that will depend upon a variety of circumstances, some of them counteracting each other, and not every one of them to be guarded against perfectly satisfactorily. In the house is but one of them out of many: much will also depend upon size, much upon the depth of the boxes and galleries, and also upon accidental and such trivial matters, that any defect or advantage so occasioned is not likely to be traced to the stage; and the circumstances and experience seems at present to be in favour of, at least not at all against, the circular form; for the new theatres at Mayence, Dresden, and other places where it has been adopted, are said to be perfectly satisfactory in regard to the actors being distinctly heard in every part.

While in their internal embellishment and fitting up theatres afford very great scope to the architect, though not so much as they might do, they also afford opportunity of showing the result of that ingenuity in stage and general design. Magnificent as are the exteriors and façades of the theatres at St. Petersburg, Berlin, Munich, Bordeaux, and Nantes, with their porticoes and colonnades, there is nothing in them that very clearly expresses their particular use or character, because there is no difference between the form of the house itself within, Moller, we believe, was the first who made the internal plan discover itself from without, by making the auditorium, at least the corridors and saloon surrounding it, project out as a spacious semi-circle, in the façade of the theatre at Mayence. The same form of exterior has been given by Semper to the new theatre at Dresden, which is also remarkable for the display it makes of sculpture.

After all, it is the stage itself, with its multiform contrivances and complex mechanism, its scenery and pictorial effects, which manifest the extraordinary perfection to which the moderns have carried the scenic, if not the dramatic art; nor can we indeed lay too much stress upon the need of having that kind will meet with many plates showing the stage construction and mechanism of Plymouth theatre, in Foulstone's 'Public and Private Buildings'; and, with more general and complete instructions, in Stephenson's work on the machinery of theatres, who seem to have introduced into theatres at the commencement of the seventeenth century.

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<table>
<thead>
<tr>
<th>ITALY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Table of Modern Theatres.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Architect.</strong></td>
<td><strong>Date.</strong></td>
</tr>
<tr>
<td>Bologna</td>
<td>Ant. G. Bibbiena</td>
</tr>
<tr>
<td>Milan, La Scala</td>
<td>Gius. Piermarini</td>
</tr>
<tr>
<td>Parma, Great Theatre</td>
<td>Gium. Alleotti, Bernini</td>
</tr>
<tr>
<td>Parma, New Theatre</td>
<td>Canonicas and Nic. Bettoli</td>
</tr>
<tr>
<td>Rome, La Argentina</td>
<td>Marq. Teodoli</td>
</tr>
<tr>
<td>Rome, Teat. della Valle</td>
<td>C. Fontana, but since altered</td>
</tr>
<tr>
<td>Venice, La Fenice</td>
<td>Ant. Selva</td>
</tr>
<tr>
<td>Vicenza, T. Olimpico</td>
<td>Palladio</td>
</tr>
</tbody>
</table>

**France.**

<table>
<thead>
<tr>
<th><strong>Architect.</strong></th>
<th><strong>Date.</strong></th>
<th><strong>Width of Curtain.</strong></th>
<th><strong>From Curtain to Back of Pit.</strong></th>
<th><strong>Greatest Breadth of Pit.</strong></th>
<th><strong>Height from Floor of Pit.</strong></th>
<th><strong>Stage.</strong></th>
<th><strong>Description.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Paris, L'Océan</td>
<td></td>
<td>1820</td>
<td>524</td>
<td>67</td>
<td>64</td>
<td>66 deep</td>
<td>An insulated structure, about 17: x 118 feet, originally built by Dc Walley and the elder Peyre.</td>
</tr>
<tr>
<td>Paris, Français</td>
<td></td>
<td>1790</td>
<td>29</td>
<td>59</td>
<td>54</td>
<td>54</td>
<td>Saloon 90 by 21, and 21 feet high.</td>
</tr>
<tr>
<td>Paris, Académie Roy. de Musique, or Opera</td>
<td></td>
<td>1822</td>
<td>524</td>
<td>67</td>
<td>64</td>
<td>66 deep</td>
<td>Insulated structure, 172 by 114 feet. Exterior two orders, Doric and Ionic, in arcades. Saloon 90 x 21, and 21 high. Front curved.</td>
</tr>
<tr>
<td>Paris, Ventadour</td>
<td>Huvé</td>
<td>Opened Augst. 1821</td>
<td>49</td>
<td>67</td>
<td>64</td>
<td>64</td>
<td>Saloon 90 by 21, and 21 feet high.</td>
</tr>
<tr>
<td>Paris, Feydeau</td>
<td>Legrand and Molinos</td>
<td>About 1790</td>
<td>49</td>
<td>60</td>
<td>50</td>
<td>44</td>
<td>70 deep 48 wide</td>
</tr>
<tr>
<td>Name</td>
<td>Architect</td>
<td>Date</td>
<td>Width of Curtains</td>
<td>From Curtain to Back of Pit</td>
<td>Greatest Breadth of Pit</td>
<td>Height from Floor of Pit</td>
<td>Stage</td>
</tr>
<tr>
<td>-----------------------</td>
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<td>--------------</td>
<td>-------------------</td>
<td>----------------------------</td>
<td>-------------------------</td>
<td>--------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Bordeaux</td>
<td>Louis</td>
<td>1780</td>
<td>39½ ft.</td>
<td>64 ft.</td>
<td>62½ ft.</td>
<td>67½ ft.</td>
<td></td>
</tr>
<tr>
<td>Besançon</td>
<td>Ledoux</td>
<td>About 1777</td>
<td>49</td>
<td>63 to back of boxes</td>
<td>36</td>
<td>33½ ft.</td>
<td>68</td>
</tr>
<tr>
<td>Lyon</td>
<td>Soufflot</td>
<td>1754-6</td>
<td>37½ ft.</td>
<td>62</td>
<td>49</td>
<td>47½ ft.</td>
<td>51</td>
</tr>
<tr>
<td>Nantes</td>
<td>Cruy</td>
<td>About 1810</td>
<td>37½ ft.</td>
<td>62</td>
<td>49</td>
<td>47½ ft.</td>
<td>51</td>
</tr>
</tbody>
</table>

**GERMANY AND BELGIUM.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Architect</th>
<th>Date</th>
<th>Width of Curtains</th>
<th>From Curtain to Back of Pit</th>
<th>Greatest Breadth of Pit</th>
<th>Height from Floor of Pit</th>
<th>Stage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berlin, Opera-house</td>
<td>Von Knobelsdorff</td>
<td>1740-3</td>
<td>29</td>
<td>64</td>
<td>42</td>
<td>58</td>
<td>50</td>
<td>An insulated building, 214×78 feet. Principal front, Corinth. portico, hexastyle monopyle on low basement.</td>
</tr>
<tr>
<td>Great Theatre</td>
<td>Schinkel</td>
<td>1816</td>
<td>43</td>
<td>62</td>
<td>44</td>
<td>56</td>
<td>52</td>
<td>A magnificent structure, with Greek Ionic hexastyle portico on a lofty flight of steps.</td>
</tr>
<tr>
<td>Dresden</td>
<td>Semper</td>
<td>1837-7</td>
<td>40</td>
<td>69 to back of boxes</td>
<td>50</td>
<td>56</td>
<td>60</td>
<td>Plan of auditory nearly circular, i.e., a circle of 55 feet diameter, to which the curtain is a tangent.</td>
</tr>
<tr>
<td>Hamburg</td>
<td>Schinkel</td>
<td>1829-7</td>
<td>39</td>
<td>78</td>
<td>62</td>
<td>64</td>
<td>66</td>
<td>Insulated, about 250×140 feet, with semicircular projection, 140 feet diameter on one of longer sides or facade.</td>
</tr>
<tr>
<td>Mannheim</td>
<td>Ant. G. Bibiena Moller</td>
<td>Fin. 1833</td>
<td>39</td>
<td>46</td>
<td>42</td>
<td>58</td>
<td>60</td>
<td>Burnt Jan. 14, 1823; restored 1824-25. Octastyle Corinth. portico, including boxes, the auditory, a circle 72 feet diameter, between which and curtain is a space of 9 feet. Five tiers of boxes.</td>
</tr>
<tr>
<td>Mayence</td>
<td></td>
<td>1818</td>
<td>39</td>
<td>78</td>
<td>62</td>
<td>64</td>
<td>66</td>
<td>Private theatre, fitted up in Gothic style, but detail in poor taste.</td>
</tr>
<tr>
<td>Münich</td>
<td>K. von Fischer</td>
<td>Open. 1818</td>
<td>23</td>
<td>44</td>
<td>29</td>
<td>36</td>
<td>60</td>
<td>Facade 300 feet. Oval saloon 91×56, making, with smaller saloon and concert-room, an extent of 270 feet.</td>
</tr>
<tr>
<td>Wolfenbüttel, in the palace</td>
<td>Ottmer</td>
<td>1836-7</td>
<td>37</td>
<td>59</td>
<td>42</td>
<td>56</td>
<td>56</td>
<td>Private theatre, fitted up in Gothic style.</td>
</tr>
<tr>
<td>Ghent</td>
<td>Roelandt</td>
<td>1837-9</td>
<td>37</td>
<td>59</td>
<td>42</td>
<td>56</td>
<td>56</td>
<td>Private theatre, fitted up in Gothic style.</td>
</tr>
</tbody>
</table>

**RUSSIA.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Architect</th>
<th>Date</th>
<th>Width of Curtains</th>
<th>From Curtain to Back of Pit</th>
<th>Greatest Breadth of Pit</th>
<th>Height from Floor of Pit</th>
<th>Stage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Petersburg, Great Theatre</td>
<td>Tischbein; Tho</td>
<td>1792-3</td>
<td>52</td>
<td>60</td>
<td>50</td>
<td>52</td>
<td>52</td>
<td>Insulated building, 150×270 feet, with octastyle Ionic portico. Saloon 125×30 feet.</td>
</tr>
<tr>
<td>Great Theatre</td>
<td></td>
<td>1809</td>
<td>56</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>Theatre a semicircle, without boxes, but surrounded by a Corinthian colonnade of 13 intercolumnia, with seats.</td>
</tr>
<tr>
<td>Theatre of 'Hermitage'</td>
<td>Quarenghi</td>
<td>1790</td>
<td>36</td>
<td>60</td>
<td>42</td>
<td>70</td>
<td>70</td>
<td>No proscenium. Corridors, &amp;c. very mean.</td>
</tr>
</tbody>
</table>

**ENGLAND.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Architect</th>
<th>Date</th>
<th>Width of Curtains</th>
<th>From Curtain to Back of Pit</th>
<th>Greatest Breadth of Pit</th>
<th>Height from Floor of Pit</th>
<th>Stage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>London, Opera-house</td>
<td>Novosielasky</td>
<td>1790</td>
<td>40</td>
<td>64</td>
<td>60</td>
<td>51</td>
<td>51</td>
<td>The whole building about 209×160 feet. Salloon 58×19 feet.</td>
</tr>
<tr>
<td>Covent-garden</td>
<td>Sir R. Smile</td>
<td>1809</td>
<td>32</td>
<td>66</td>
<td>61</td>
<td>64</td>
<td>64</td>
<td>The whole building about 209×160 feet. Saloon 58×19 feet.</td>
</tr>
</tbody>
</table>
Several theatres, all more or less worthy of notice, have been erected within the present century, but are omitted in the table, as we cannot specify the respective dimensions. The subject of the names, with their architects, may however be useful:

- Brescia; Canoneca.
- Ferrara; Antonio Boschi.
- Florence, Teatro Goldoni; Gius. del Rosso, 1817.
- Mantua; Gotha; Baden; Coblentz; Weinbrenner.
- Langhans, opened November, 1841.
- Cannstatt; Ludw. Zanth, begun 1838.
- Karlsruhe; Weinbrenner, 1807-8.
- Coblenz, Von Krahe.
- Darmstadt; Moller and Heger, 1819-20.
- Gotha; Semper, 1837-9. Opened May, 1840.

- St. Petersburg; Alexandrinsky Theatre; Rossi. Opened August, 1832.

THEATRE. Before the reign of Elizabeth theatrical representations appear to have been subject to no legal restraint beyond the liability of those who conducted them to the vagrant laws. Until the middle of the seventeenth century, players were always attached to the establishment of the court or of some wealthy subject, whose badge and livery they wore, and whose superintendence was presumed to control any excesses which might be injurious to the public; but when their services were not required by those to whom they especially belonged, it was usual for such persons to wander about the country, exhibiting their performances for gain, and thus becoming strollers, and even mendicants. In the reign of Henry VII, an instance is recorded of a gratuity given by that king to some players that begged by the way. The chief restrictions to which such persons were liable previously to the statute of Elizabeth in which they were expressly mentioned, were measures of police for preventing tumults and breaches of the peace by the assemblage of large numbers of people at their representations. Occasionally however these popular exhibitions attracted the animadversion of the government by holding up matters of state to public censure or ridicule. Thus in 1566, when the unpopular marriage of Queen Mary with Philip of Spain had created great excitement throughout the country, the council directed the attention of the lord president of the North to certain lewd persons naming themselves to be servants of Sir Francis Lake, and wearing his livery or badge on their sleeves, having wandered about these northern parts, and representing certain plays and interludes reflecting on the queen and her consort and the formalities of the mass. (Strype's Ecclesiastical Memorials, vol. iii., Appendix, p. 165.) Excesses of a similar character, customary in the following of the reigning prince, and directed against the Protestant religion, were checked by the stat. 1 Eliz. c. 2, s. 9, which inflicted a penalty of 100 marks upon persons who played in plays or interludes declared or spoken anything in derogation, depraving or despoiling of the Book of Common Prayer.

But although players, as such, were in those days subject to no general legal restrictions, it is probable that the practice of granting licences from the crown to such persons prevailed as early as the reign of Henry VIII. It appears too, from a curious paper published by Malone, in his 'Historical Account of the English Stage,' that in the reign of Elizabeth strolling players, though belonging to some great person, usually applied for a licence to the local authorities of any town in which they meant to perform. 'When players of interludes come to the city of Gloucester,' says this document, 'the manner is as in other like corporations, that they first consult the mayor to inform him of the licenses they are, and so to require licence for their public playing.' The earliest theatrical licence from the crown now extant is that granted by Queen Elizabeth, in 1574, to James Burbage and four other persons, 'servants to the Earl of Leicester,' and the profits of such performances thereby authorised, before they are publicly represented, shall be seen and allowed by the queen's master of the revels; a stipulation analogous to the licence of the lord chamberlain under the Licen- tiae Act at the present day. These licences from the crown were originally nothing more than authorities to itinerants, which exempted strolling players from being molested by proceedings taken under the laws or proclamations against vagrants, and also superseded the necessity of licences from the local magistrates. The statute 39 Eliz., c. 4, went a step farther, and by implication authorised noblemen to bring players, by enacting that 'all common players of interludes wandering abroad, other than players of interludes belonging to any baron of the realm,' or any other bearer of greater degree, to be authorised to play under the hand and seal of arms of such or personal, should be adjudged rogues and vagabonds. This statute has been frequently misrepresented, as supposing all players as rogues and vagabonds; (Pynne's Hist. of the London Theatre, vol. ii. p. 597;) whereas it is obvious that the enactment applies only to strolling players. Although theatrical representations became much more general under the reigns of James I. and Charles I., no larger licences were expressly enacted for their regulation, with the one exception of the stat. 1 Car. I., c. 1, which suppressed the performance of interludes and common plays upon Lord's Day. An ordinance of the Long Parliament, 1641, directed to the suppression of all stage-plays and interludes, but though occasionally enforced with severity, it failed to abolish these entertainments. The stat. 12 Ann., stat. 2, c. 23, in general terms, classed players as rogues and vagabonds; but the stat. 10 Geo. I., c. 28, s. 1, expounded the former statute by enacting that 'every person, who should for hire, gain, or reward, act, represent, or perform any play or other entertainment of the stage, or any part therein, if he shall not have a legal security from the person to whom the offence should be committed without authority by patent from the king, or licence from the Lord Chamberlain, should be deemed a rogue or vagabond within the stat. 12 Ann.' But this provision has now repealed by the stat. 6 Geo. IV., c. 83, and players such as itinerants or itinerant, are at the present day not amenable to the law as rogues and vagabonds. By the 2nd section of the above statute, 10 Geo. II., c. 58, which, with the exceptions just mentioned, forms the full operation of the metropolis, it is enacted generally, that 'every person shall, without a patent or licence, act or perform any entertainment of the stage for hire, gain, or reward whatsoever, to the sum of 50l. By the 5th section, which is the application to the metropolitan district, it is enacted, that 'no person shall for hire, gain, or reward, act, represent, or perform any new interlude, tragedy, comedy, opera, play, farce, or other entertainment of the stage, or any part therein; or any new act, scene, or other part.
added to any old interlude, tragedy, comedy, opera, play, farce, or other entertainment of the stage, or any new pro-
longed, true copy thereof, to be presented before the Lord Chamberlain of the King's household for the time being, fourteen days at the least before the acting, representing, or performing thereof, together with an ac-
count of the play-house or place where the same shall be, and the time when the same shall be acted, represented, or performed, signed by the master or manager." The 4th section authorizes the Lord Chamber-
lain to prohibit the performance of any theatrical enter-
tainment, and subjects the persons infringing this prohi-
bition to a fine not exceeding twelve pounds, to pay or licence. The 9th section provides that, 'no person shall be authorized to act, represent, or perform for hire or reward any interlude, tragedy, comedy, opera, play, or other entertainment of the stage, in any part of Great Britain, except in the city of Westminster and within the liberties thereof, and in such places where the King shall personally reside, and during such residence only.' The 7th section declares that 'if any interlude, tragedy, comedy, opera, play, farce, or other entertainment of the stage, or any act, scene, or part thereof, shall be acted, represented, or performed in any house or place where wine, ale, beer, or other liquors shall be sold or re-
turned, though not by retail, though and for gain, hire, and reward.'
Within a few years after the passing of this act of parliament, the clause which restricted the power of granting patents by the Crown to theatres within the city of Westminster and the places of meeting or acting where play, farce, or other entertainments were to be productive of inconvenience; and special acts of parliament were passed exempting several large towns, in which such entertainments were desired, from the operation of that clause, and authorizing the performance of such entertainments in the towns in such places. Instances of statutes of this kind occur with respect to Bath in stat. 8 Geo. III., c. 10; with respect to Liverpool in the stat. 11 Geo. III., c. 16; and with respect to Bristol in the stat. 16 Geo. III., c. 8.
A tax was imposed by the stat. 10 Geo. II., c. 28, for the regulation of theatrical performances, was effected by the statute 28 Geo. III., c. 30, in favour of places which could not be expected to bear the expense of a special act of parliament. By this latter statute, the justices of the peace at general or quarter sessions are authorized to license the performance of any such tragedies, comedies, interludes, operas, plays, or farces as are represented at the patent or licensed theatre in Westminster, as well as to grant licenses to any person, the Lord Chamberlain, at any place within their jurisdiction not within 20 miles of London, Westminster, or Edinburgh, or 8 miles of any patent or licensed theatre, or 10 miles of the King's residence, or 14 miles of either of the universities of Oxford or Cambridge, to take the outward limits of any place having peculiar jurisdiction.
The penalties imposed by the stat. 10 Geo. II., c. 28, being found in practice insufficient to prevent the performance of theatrical entertainments without licence, and great evils being experienced from the resort of the lower orders in London to such entertainments, the legislature in the year 1839 gave additional powers to the metropoli-
tan police for their prevention. By the 48th section of the stat. 2 and 3 Vict., c. 45, the Commissioners of police are power-
ed to authorize a superintendent, with such constables as he may think necessary, to enter into any house or room, kept or used within the metropolitan police district, for stage-plays or dramatic entertainments into which admission is obtained by payment of money, and which is not a licenced theatre, and to take into custody all persons who shall be found therein without lawful excuse.' The same clause enacts that 'every person keep-
ing, using, or knowingly letting any house or other ten-
ement for the purpose of being used as a dramatical or theatrical theatre, shall be liable to a penalty of 20L, or, in the dis-
crition of the magistrate, may be committed to the House of Correction, with or without hard labour, for two calen-
dar months; and every person present, or being there without lawful excuse shall be liable to a penalty of forty shillings.' It may be desirable in this article to refer to a statute which was passed in the year 1833 for the protection of dra-
matic literary property, and which placed such property upon the same footing as the copyright of published books. The stat. 3 & 4 Will. IV., c. 15, enacts that the author of a tragedy, comedy, play, opera, farce, or any other dra-
matic piece or entertainment, shall have the sole property of representing the same at any place of dramatic entertainment; and that the author of any such production, published within 10 years before the passing of the said act, shall have the exclusive right of publication until the end of twenty-eight years, and, if the author be living at the end of that period, during the residue of his natural life, have as his own property the sole liberty of representing such production. The infringe-
ment of this right under a penalty of forty shillings for every unauthorized representation of such production, or the amount of the benefit derived from such representation, or of the injury sustained by the author thereof, whichever shall be the greater damages.
THEATRE, ENGLISH, FRENCH, &c. [ENGLISH DRAMA.]
THEATRE, HINDU. [SANSCRIT LANGUAGE AND LITERATURE.]
THEBAI. [PARAMORPHIA.]
THEBAID, or THEBAIS (Θηβαίκα, Παμ. Θηβάικα, Θηβαίς), signi-
fies the territory or district belonging to Thebes, and is consequently applied to the whole territory subject to the city of Thebes in Boeotia. (THEBES IN BOEOTIA.)
In a later period of time, and represented, to the whole of Upper Egypt, the modern Sait, of which Thebes was the principal city. This territory extended from Hermopolis Magna southward as far as the first cataract of the Nile, or to Philae; or, according to others, as far as the river Syene. (THEBES, II.)
This extended territory, which is often called Thebaic, is a province, or rather a part of the last this of Thebaids, or Thebais, and was a part of the Theban nome, which was divided into a large number of districts, or districts, such as those on the western bank of the Nile, and each extending from the river to the foot of the hills which enclose the valley of the Nile. This gigantic city, whose ruins still excite astonishment, was believed to be the most antient city of Egypt, and the original metropolis of the Thebaid. The foundation was ascribed to some by Osiris, who named it after his mother (Diodorus Sic., i. 15), and by others to the last king of the house of Bussiris (Diodorus Sic., i. 45.) According to other authorities, Thebes was an Egyptian colony. Its original circumference is stated to have been 140 stadia. Its most flourishing period appears to have been about 1600 B.C., when it was the capital of all Egypt, and when, according to Herodotus and Aristotle, the whole country of Egypt bore the name of Thebes (Thiasos). During that period, which probably comprises several centuries, Thebes was the residence of the Egyptian kings, whose tombs are still extant in the rocks on the western side of the city, and extend even to the borders of the desert. (Strabo, vi., p. 816, ed. Cassaiu.) Homer (Iliad, ix. 381, &c.) speaks of the splendour, greatness, and wealth of Thebes, and calls it 'the city with a hundred gates,' each of which sent out two hundred men with horses and chariots. During the period of the Ptolemies, and under Cambyses, Thebes, like other towns, suffered very severely, especially the private dwellings, which were for the most part constructed of wood, while the great archi-
tectural works defied the flames as much as was possible. (Diodorus Sic., i. 40; Herodotus, iii., 25; Pliny, Hist. Nat., xxxvi. 9.) After this catastrophe the city appears never to have recovered her former greatness. During the time of the Ptolemies, when the seat of government was in the northern extremity of the country, Thebes appears to have been neglected by
the Egyptian kings. In the reign of Ptolemy Lathyrus, about B.C. 86, it revolted, and after a siege of three years in which the city was captured but not taken, it fell to the forces of Strabo, when its name Thebes had been changed by the Greeks into Diospolis (Διος πόλις, Diocles Magna, that is, the great city of Jove), and the circuit of the city, which could still be traced, amounted to eighty stadia, the plan consisting of a number of walled sections; and in the time of Strabo the remains of the ancient city consisted chiefly of temples. Under the Roman dominion something appears to have been done to restore or preserve the venerable city; but new calamities broke in upon it when Christianity was introduced. In the Christian era the great number of religious zeal destroyed and appropriated to themselves as much as they could of the works of the ancient idolators. At present the site of the city is occupied by four principal villages, which consist of the eastern city, the citadel, the gardens of Thebes alone. Those of ancient Thebes were distinguished above all the other Greeks for rusticity, fierce, and passion. Hence a Theban was always ready to settle any dispute, either with a fellow-citizen or with a foreigner, by fighting rather than by the ordinary course of justice. The women were celebrated for their gentleness and beauty. (Dicarensis, as above.)

In early times Thebes was governed by kings, who play a more conspicuous part in the history of Thebes than the chiefs of any other part of the country. The last of these kings, Xanthus, was slain in single combat by Andropompos. After this event the government of Thebes became an aristocracy, or rather an oligarchy. Of these, say Isaeus, the number was increased almost daily, a fact which shows that it was frequently restored for a short time, gave way to a democracy. When we read that no one was allowed to hold any public office unless he had, at least for ten years, not been engaged in any trade, this rule seems to refer to the period of the aristocratic period. (Thucyd., i., 10; vi., 4, p. 209, ed. D Gregory.) During the time of the Persian invasion, the government is again called an oligarchy; but it is added that this was not the constitution which the Thebans had given to themselves, but a state, called by the name of their heroes. (Thucyd., iv., 76; v., 31; Diodorus Sic., xii., 60; but this appears to refer only to the influence of the magistrates, for throughout that time, as well as afterwards in the time of Eumenes and Polipidas, it was the assembly of the people which was the ruling power, and of which the magistrates were only the agents, as those relating to war and peace. Xenophon, Hellenica, iii., 5, 8.) Henceforth the democratic constitution appears to have continued at Thebes down to the time that the Thebans entered Greece. It was at least a share of it that remained even afterwards. Along with the city, which, at least in later times, was as tumultuous as that of Athens (Polybius, vi., 44). Thebes also had a senate; and the magistrates, who were elected annually by the people, bore the name of polemarchs. As a state Thebes was not confined to the city and its immediate neighborhood, but comprised the whole territory between the eastern coast of Lake Copais and Mount Cithæmæ, and extended to the north as far as the little river Cephissus, which empties itself in the sea between Euboea and the mainland. This whole territory was called Boeotia, and contained a great number of towns which were subject to Thebes. Among the fourteen confederate states of Boeotia, there is a city which is generally called the capital of Boeotia, which, in a strict sense of the word, it certainly was not. (Boeotia.)

Besides the Egyptian and Boeotian Thebes, the following towns of this name are mentioned by ancient writers — 1. Thebes in Euboea (the old Thebes, Thebæ Phthia, or Thebæ Phthina) was an important commercial town with a good harbour. (Strabo, i., 431, 433, 436; Livy, xxxiv., 25; xvii., 7, 6.) 2. Thebes (Ønion) in Thessaly was celebrated for its walls, which made a sort of naturalituur of Actium, and taken and desolated by Achilles. The plain in which the town had been established was found to the lowest times as the Phoc of Thebes (τό µνημεῖον τῆς Θήβας; Homer, Iliad, i., 138; vii., 327; Strabo, ii., 436; viii., 66; Herodotus, vii., 69).
THE, in that part of Arabia Felix which was called the country of the Cossædoptileps.

4. Thebes in Lucania in Italy (Pliny, Hist. Nat., iii. 1.) Stephanus of Byzantium (s. v. Θηβαι) mentions several towns of this name, of which however nothing is known.

THECA, a term in vegetable anatomy. It was applied by Sprengel to that part of the stamen which contains the reproductive granules and which is now generally called the anther. [ANTHER]

It is also extensively employed in cryptogamic botany. Among the fers, it is applied, in common with the terms capsule, conceptacle, and pericarp, to that part of the fruit which constitutes the masses called sori. In the Lycopodiaceae it expresses the assemblage of cases, which are attached to scales arranged in a conical manner.

The same term is used to indicate the kidney-shaped preserved cases that contain the reproductive matter of Lycopodium and also the urn-like organs that enclose the spores of mosses. It is by some writers still further extended, and used to express the parts that contain the reproductive structures of mosses.

THECA (in Anatomy) is a term commonly applied to the thin fibrous sheaths in which certain soft parts of the body are enclosed. Thus the theca vertebrotis is the sheath of dura mater in which the spinal chord is enclosed; and the sheath of the blood vessels is similarly expressed by the sheath of the muscles of the hand and foot run are called the theca.

These last are always lined by a synovial membrane, and contain a small quantity of fluid [SYNOVIA], by which the sliding of the tendons is facilitated.

The term ACTIVIA has been given to those Geckos which have the toes enlarged throughout their length, and furnished below with transverse scales, which are divided by a longitudinal furrow, where the claw may be entirely hid.

THECIDEA, or THECIDIUM. [Brachipoda, vol. v., p. 313.] Mr. J. E. Gray arranges the Thecideidae as the fourth family of the Brachipoda, placing it between the Productidae and the Cranidae, and making it consist of that order.

THECODONTOSAURUS. [Thecodonts.]

THECODONTS. Professor Owen, in his 'Report on British Fossil Reptiles,' observes that among the inferior or squamate sauurs there are two leading modifications in the mode of attachment of the teeth, the base of which may be either anchylosed to the summit of the alveolar ridge, or to the bottom of an alveolar groove, and supported by its lateral wall. These modifications are, he remarks, indicated respectively by the terms 'acrodont' and 'pleuro;

which third fixation is preserved in the most extinct sauurs, which, in other parts of their organization, adhere to the squamate or lacertine division of the order, the teeth being implanted in sockets, either loosely or confluent with the bony walls of the cavity: the Professor, in his 'Bone-geography,' termed the Thecodont Lucertians, the most antient of all sauurs belonging to this group.

Commencing with the Thecodontosaurus of Dr. Riley and Mr. Stutchbury, described by them in the 'Geological Transactions' of 1836, from remains found in the dolomitic conglomerate of Redland, near Bristol, the oldest or lowest division of the new red sandstone series, Professor Owen remarks that this reptile is allied to the typical Varanun Monocolii, but having the more extreme, and the most extinct sauurs, approach to this condition in the shallow cavities containing the base of their teeth along the bottom of the alveolar groove. It is to have obtained, under consideration, the sockets are, he states, deeper, and the inner alveolar wall is nearly as high as the outer one; the teeth are arranged in a close-set series, slightly decreasing in size towards the posterior part of the jaw; each branch of the jaw has contained twenty-two teeth which are conical, rather slender, compressed and acutely pointed, with an anterior and posterior finely serrated edge, the serrations being directed towards the apex of the tooth, as in O. Fischer's genus Rhinosaurus; the outer surface is curved than the inner one; the apex is slightly recurved; and the base of the crown contracts a little to form the subcylindrical fang. He then goes on to remark that the pulp-cavity remains open in the base of the crown; that, in their microscopic structure the teeth of the Thedodonosaurus closely correspond with those of Varanus, Monitor, and Megalosaurus; that the body of the tooth consists of compact dentine, in which the calicigerous tubes diverge from an open pulp-cavity at nearly right angles to the surface of the tooth; that they form a slight curve at their origin, with the concavity directed towards the base of the tooth; and placed at the periphery, bend upwards in the contrary direction. The diameter of the calicigerous tube he gives as 1-30,000th of an inch, and the breadth of the interspace of the tube as 1-800th of an inch. The crown of the tooth is in-}

In their compact form, anterior and posterior serrated edges, sharp points, and microscopic structure, these teeth agree with those of the Saurian reptiles of the

Of PALOSAURUS Professor Owen states that its tooth is compressed, pointed, and with trenchant serrated margins; but that its breadth, compared with its length, is much greater than in Thecodontosaurus. The vertebrae associated with these teeth were biconcave, with the middle of the body more constricted, and terminal articular cavities rather deeper than in Teleosauros; but, the Professor adds, they are chiefly remarkable for the remarkable length of the spine canal at the middle, where it sinks into the substance of the centrum, and thus the canal is wider vertically at the middle than at the two ends of the vertebra: an analogus structure, he observes, is not less marked, obtains in the dorsal vertebrae of the Rhinosaurus from the new red sandstone of Shropshire.

Professor Owen then points out that besides deviating from existing lizards in the thecodont dentition and bico-

saurian characters, the new Teleosaurus is, the thecodont conglomante also differed in having some of their ribs articu-
lateci a head and tubercle to two surfaces of the vertebra, as at the anterior part of the chest in Crocodiles and Dinosaurs. The shaft of the rib, he tells us, was tra-

forms, as in the Thecodont and Rhinosaur. The concave, and, as he observes, appears to have been little more than half the length of the femur; and to have been, like that of the Rhinosaur, unusually expanded at the two extremities.

After quoting the description of the femur by the discoverers of the present thecodont reptiles, Professor Owen remarks that the tibia, fibula, and metatarsal bones manifest, like the femur, the fitness of the thecodont saurians for progression on four feet. The unusual size of these bones, and, as he observes, appears to have been little more than half the length of the femur; and to have been, like that of the Rhinosaur, unusually expanded at the two extremities.

The Professor draws the following conclusions from the knowledge at present possessed of the osteology of Theo-

dontosaurus and Palosaurus, whose antiquity the discoverers of these genera regard as being greater than that of any other vertebrated animals, excepting fishes:

In their typical denture of dentition, bicconcave vertebrae, double-jointed ribs, and proportionate size of the bones of the extremities, are closely allied to the Teleosau-

rues; but they combine a lacertian form of tooth and structure of the pectoral and probably pelvic arch with these crocodilian characters, having distinctive modifications, as the moniliform spinal canal, in which however the almost contemporaneous Rhinosaur participates.

Professor Owen adds that it would be interesting to ascertain whether the caudal vertebrae are characterized, as in the Thuringian Protosaurus, by double diverging spinal processes.

Cladogodon, Owen.—In the new red sandstone (keuper) of Warwick and Leamington, says the Professor, 'there occur detached, pointed, trenchant, recurved teeth, the crowns of which are sometimes 1 inch 4 lines in length; in length and 6 lines across the same quarries as those containing the remains of Laebryin-

thodon. In their compressed form, anterior and posterior serrated edges, sharp points, and microscopic structure, these teeth agree with some of the Saurian reptiles of the

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Bristol conglomerated. In their breadth, as compared with their length, which is less, they are intermediate between the *Thecosomata* and *Paleosoma platyodon*; but they are larger, with longer and more recurved crowns, and thus more nearly approach the form characteristic of the teeth of the *Megacodon*. From these teeth however they differ in their general degree of compression, and in a slight contraction at the base of the crown; I therefore indicate the genus of which, as yet, only the teeth are known, by the name of *Cladodon*, and the species from the Warwickshire sandstones by the name of *Cladodon Lloidyi*, a specimen of the friendly aid of Dr. Lloyd of Leamington, to whose zealous co-operation I owe the materials for the description of the teeth of the present genus, and the still more remarkable ones of the British species of *Labirynthodon*, with which the teeth of the *Cladodon* are associated.

In conclusion, Professor Owen refers to a tooth of *Cladodon* figured by Mr. Murchison and Mr. Strickland in their paper on the Warwick sandstones. (Geol. Trans., 2nd series, vol. v.)

THECOSEOMATA. M. de Blainville’s name for his first family of *Aporobranchiate*, the first order of his second section of his second subclass (*Paracopephala* Monocois).

The *Aporobranchiate*, according to M. de Blainville, consist of those *Mammalia* and Batrachia, which have the body of a slightly variable form, but constantly provided with natatory appendages which are equal and lateral, without any foot properly so called, and which have the rippled expiration but little evident.

The following genera are arranged by M. de Blainville under the family of *Thecosomata*:

- **Hyalina**: Cleodoris, divided into two sections; 1, depressed species, Ex., *Cleodoris Brownii*; 2, conical and not depressed species, Ex., *Vaginella depressa*; *Cymbula*: and *Pyrgo* (fossil).

The principal forms of this family are treated of under the article HYLALIDE.

Mr. J. G. D. Z. P. makes the *Thecosomata* the first order of the class (4th) *Pteropoda*, divides the forms which, in his opinion, should be arranged under that order, into the following families and genera:

- Fam. 1. Cleodoridae.
- Gen. — *Hyalina*: Diaeria; *Cleodoris*; *Balantium*; *Pleuropus*; *Vaginella*; *Cresida*; *Brochus*; *Psycha*; *Euribia*.
- Fam. 2. Limacicidna.
- Gen. *Limacia*.
- Fam. 3. Cuvieridna.
- Gen. — *Cuviera*: *Tripterus*.
- Fam. 4. Cymbilidae.
- Gen. *Cymbula*.

**Theken, Johann Christian Anton**, a celebrated chemist, was born Sept. 13, 1714, at Steinbeck, a small village not far from Wismar, in the duchy of Mecklenburg. His family had been ruined by the disasters of war, and his father died when he was young, which two melancholy events had an unfavourable influence upon his education and his first entrance into life. He had hardly received the barest elements of education, when, at the age of thirteen, he was reduced to the necessity of hiring himself out as a servant; but this occupation was so revolting to his feelings, that he determined to learn a trade. Accordingly his elder brother, who was a tailor, received him as an apprentice; but Theden did not find this employment more suited to his taste and talents than his former one, and, as he got nothing but reproofs from his brother, he finally determined to devote himself to the study of medicine. He was first placed by his friends with a surgeon at Butzow, where he spent four years in a barber’s shop without any real advantage; and as soon as his senior proceeded to Rostock, Hamburg, Lübeck, and Danzig. In this last city he at length succeeded in obtaining some employment in the troops of the king of Prussia, and was attached as surgeon to a squadron of cuirassiers. The zeal and punctuality with which he did his duty, and the great degree of his superiors’ respect for him, and the esteem and friendship of his superior officers: the jealousy however of the chief surgeon (chirurgien-major) prevented his profiting by the good-will shown him by king Frederick William I. at a review at Riesenberg, and the death of this prince put an end to all the hopes of promotion which he had at first entertained. In 1742 he went to Berlin, where the celebrated Schaefferschmidt, who just appreciated his talents, honoured him with his friendship and procured for him the post of chief surgeon during the second war in Silesia. At the end of three years he returned to Berlin, and devoted himself with unremitting attention to the study of anatomy and surgery. The death of G. Reissler afterwards offered him numerous opportunities of displaying the skill that he had acquired, and also the excellent qualities of his heart. Frederick the Great raised him gradually from one post to another, till he became at last his chief military surgeon.

In the course of the services, and displayed an activity which contributed still more to gain him the good opinion of his sovereign. The successes of Frederick honoured him equally with his confidence. The end of his long esteem and respect for which he was indebted not only to real merit and eminent services. He died, October 21, 1797, at the age of eighty-three. The continual labours and agitation of war did not prevent his drawing up and settling in order the observations which the best action of his time had given him an opportunity of collecting. His works are not numerous, but they bear the stamp of experience, and one recognises in them the firm and bold touch of a man who did not venture to take up his pen till after he had fought his battles.

From this eulogium we must however except all the theoretical parts of his writings, which, unfortunately, hold a prominent place in them, and which are only based upon the formation of an opinion, not by any means supported by the evidence of observation. The following is the list of his works mentioned by M. Jourdan in the "Biographie Médicale," from which work the preceding account has been taken:— Neue Bemerkungen und Erfahrungen zur Bereicherung der Wunderkunst und Medizin," Berlin and Stuttgart, 1771-1780, 8vo.; "Unterricht für die Unterwundärzte bey Armeen," Berlin, 1774, 8vo.; and 1782, 8vo.; "Send schreiben an Richter, die neu erfundnen Catheter aus der Resina elastica betreffen," Berlin, 1777, 8vo.

**Theken**, or Theina, the peculiar principle of tea, which was procured and analysed by Mr. Jobst of Stuttgart. Be prepared by boiling tea-leaves in water, filtering and concentrating the solution, and adding to it acetic acid as long as precipitation occurred; after filtration the excess of lead was precipitated by hydrochloric acid, and by subsequent evaporation crystals of these were deposited which possessed the following properties after precipitation was complete: they were soft, and more soluble in hot than in cold water, alcohol, or ether; they dissolved readily in acids, and were decomposed when heated either in sulphuric or nitric acid. Thein has no effect on vegetable bases; alkalis do not precipitate it from solution in acids, and with the action of niter a solution of potash is decomposed, and ammonium is evolved; it contains water of crystallization, which it loses at 21°. Thein may be sublimed.

According to the analysis of Jobst, thein is composed of:

- Hydrogen: 5-22
- Carbon: 49-60
- Oxygen: 16-27
- Azote: 38-91

It is to be remarked that this analysis very closely resembles that of Caffein as given by Liebig.

**Theken**, or Theina, the generic name for a subgenus: *Conus*. Ex., *Conus musantella*. (Mollucology.)

**THELIDERMAT.** Mr. Swainson’s name for a section of *Unio*. (Mollucology.) [NAIAD][125].

**THELIDOMUS.** A form placed by Mr. Swainson ex-his family, the *Trachideridae*, in the subfamily *Rotellerina*, under the generic name at the head of this article.

**Example, Thelidomus Braziliensis.**

Mr. Swainson thus describes it: ‘We have placed . . . next to the *Heliceidae* under the belief that they followed each other, although the links of connection wanting. It is clear that of all the types of the *Trachideridae* it is that which by its general form makes nearest approach to *Helice*; while the thickness of the inner lip, which spreads over the umbilicus, is found also, but in a less degree, in many of the land snails, *Lanere*.
...but a singular discovery recently made has thrown an entirely new light upon this interesting question. Among a considerable number of fresh-water Planorbis* (sic) - all of one species, which were sent to us from Brazil, we picked out two helix-looking shells, so precisely of the same olive-brown colour, and of the same size, as the others, that none but a conchologist would have been led to examine them. They appeared in fact like two little land-snails of the subgenus Zonites, that had fallen into the water where the Planorbis (sic) had been found, and those outside the shell were almost, if not quite, identical with the particles of dirt and sand. On placing them however under the magnifier, a conchologist alone can judge of our astonishment at finding that the whole of the shell was set solidly together, occasioned in part by sand only agglutinated together, yet with so much skill by the animal, that the regular turns of the involutions of the spire, and the form of the umbilicus, were most accurately preserved; they were, in short, fresh-water carinates - absolute counterparts of their marine brethren, Onusta. As we can find no notice nor even allusion to such an extraordinary genus of shells in any writer, we have considered it new, and affixed to it the name of Thelidomus. In regard to its directions in solid sections, and to the production of real or personal estates shall be accumulated for the beneficend enjoyment thereof postponed beyond the term therein limited. By the provisions of this act no person can settle or dispose of property by deed, will, or other instrument, or by any other act, wholly or partially, for any longer term than the life or lives of any such grantor or grantees, settlement, or otherwise, than as is hereinafter directed; nor shall, in the time of death of such grantor, devisee, or testator, or during the minority or incapacity of the respective minors for the time being, or during the minority or incapacity of any person or persons, who, under the acts or trusts of the deed, surrender, will, or other assurances directing such accumulations, would for the time being, if of full age, be entitled to the rents, issues, and profits, or the interest, dividends, and annual produce so directed to be accumulated. And in every case where such bankruptcy shall be directed otherwise than as aforesaid, such direction shall be null and void, and the rents, issues, profits, and produce of such property so directed to be accumulated shall, so long as the same shall be directed to be accumulated contrary to the provisions of this act, go to and be received by such person or persons as would have been entitled thereto, if such accumulation had not been directed. Sect. 3 provides, 'that nothing in this act contained shall extend to any provision for the payment of debts, or for the benefit of any grantor, settlor, devisee, or other person or persons, or to any provision for raising portions for any child or children of any person taking any interest under any such conveyance, settlement, or devisee, or to any direction touching the produce of timber or wood in any manner; but the same shall be made and given as if this act had not passed.' Sect. 3 provides that the act shall not extend to dispositions of heritable property in Scotland. It has been sometimes thought that periods specified in the act might be taken accumulatively, and that accumulation might be directed for them all successively. The language of the statute however is disjunctive, and therefore seems to give the option of selecting one only of the designated periods. And it appears clear from the act that the clause respecting the minority of persons entitled under the limitation in the instrument does not authorize a trust for accumulation extending over the minority of an unborn person to whom at majoritie the accumulated fund is finally given. (12 V.S., 225; 4 Russ., 403.)

THELPHUSIANS, M. Milne Edwards's name for a tribe of brachyurous crustaceans belonging to his family of Cotometopidae, having, as he observes, considerable analogy with the true crabs, in the passage between them and the Geocriniacs, or Land Crabs. [GECRINUS.] The general form, in fact, he remarks, of many of the Thelphusians differs but little...
The carapace of the Thelphusinae has but little or no convexity, and is wider than it is long: its anterior border is straight, and occupies about two-thirds of its transversal diameter: its lateral borders describe a regular curve. The front is remarkably wider than the buccal frame, and more or less curved downwards. The eyes have a stout and short peduncle, the length of which is never more than double the diameter, and its lower surface is occupied by the cornea for about half its length. The orbits are oval, and always present at their internal angle a narrow gap filled by the external antennae. The internal antennae are horizontal, and, in general, entirely hid by the front. The basillary joint of the external antenna penetrates into the gap which occupies the internal angle of the orbit and separates this cavity from the antennary fossae, but it little develops the movable stem which springs from it in the same gap is very small. The epistome is nearly linear, and placed on the same level as the lower border of the orbit. The buccal frame is nearly as large before as behind, and on the Coromandel the fourth joint of the external jaw-feet is inserted sometimes at the anteriormost angle, sometimes at the middle of the anterior border of the preceding joint, and sometimes at its external angle. The anterior feet are much stronger and nearly always longer than the succeeding ones, but they are but little, if at all, compressed. The third pair of feet are the longest of all, but they are not twice the length of the post-frontal portion of the carapace, and they terminate, like the others, in a styiform tarsus. The second joint of the abdominal appendages of the male covers the corresponding portion of the sternal plastron throughout its width, and extends to the basilar joint of the posterior feet. The abdominal appendages of the second pair of the male are filiform towards the end, and at least as long as those of the first pair. (M. E.)

Habits of the Tribe.—These are very remarkable. All the known species live in the earth near the banks of rivers or in humid forests; bearing a strong analogy to the Land-Crabs. (Latreille, 1802.)

M. Milne Edwards divides the tribe into three sections:—

1. Third joint of the external jaw-feet nearly square, and giving insertion to the succeeding joint by a notch in its internal angle.

Genus, Thelphusa (Latreille).

Generic Character.—Carapace wider than it is long, narrowed behind and very slightly convex above. The regions generally scarcely separated, but the stomatal region, when it is distinct, is extremely wide forwards. The fronto-oral or anterior border of the carapace occupies about two-thirds of its transversal diameter, and its lateral borders are very much arched in their two anterior third, towards the posterior border, where they are equal in width to the half or two-fifths of its transversal diameter. The front is very little inclined, nearly straight, and wider than the buccal frame. The orbits are oval; they present no distinctive characters, and are furnished with two large vertical joints which rises from their lower wall near the internal canthus of the eye. The antennary fossettes are very narrow. The basillary joint of the external antenna varies in its form, but only reaches a little, or not at all, beyond the tooth of the succeeding joint. No appendage is applied. The external jaw-feet elongated, and their third joint, nearly quadrilateral, carrying the succeeding joint at its internal angle, which is truncated: Sternal plastron nearly as long as it is wide, and approaching in its form that of the Canceridae. Anterior feet always much longer than the second pair, and unequal in size: the hands slightly curved inwards, and the claw which terminates them pointed, very much elongated, and finely dentilated. Succeeding feet all slightly channelled above; their tarsus is quadrilateral and armed with very strong horny spines; the second podia are much shorter than the third, the length of the carapace does not quite equal twice the length of the carapace. Abdomen composed of seven joints in both sexes. (M. E.)

There are several species, and the Geographical Distribution appears to be wide. The form is found in Italy, Greece, Egypt, and Syria. This species is generally considered to have been known to the ancients, and to be that noticed by Hippocrates and Aristotle: these Thelphuses are supposed to be some of the Herculean Crabs of (Paxevnwiioic ecapon of the last) (Hist. Anim., iv. 2); and to be those represented on ancient medals.

Thelphusa fluviatilis burrows in the earth on the bank of rivers.

2. Third joint of external jaw-feet nearly square and giving insertion to the succeeding joint toward the middle of its anterior border.

Genus, Bocca (Edwards; Polaina, Latreille). Generic Character.—General form nearly the same as a species of the Thelphusa; but the front, which is always bent downwards, is vertical, and the third joint of the external jaw-feet, instead of being square and having the ordinary form existing in the Canceridae, is narrowed forwards and carries the succeeding joint on the middle of its anterior border. (M. E.)

M. Milne Edwards remarks that this genus is terrestrial, like the Thelphusa,* and inhabits also the banks of rivers. He states that a disposition of an individual well preserved: in spirit by M. Andouin and himself, discovered to them a very remarkable disposition in the branchial apparatus of this crustacean: the cavities which enclose the breathing organs are elevated far above the upper surface of the branchiae, and present a great vacant space, the walls of which are lined with a tomentose membrane covered with vegetation. Example, Bocca dentata, the only known species:

Length about 2 inches.

Localities.—The Antilles and South America.

3. Third joint of the external jaw-feet having nearly the form of a reversed triangle, and giving insertion to the succeeding joint by its external angle.

Genus, Trichodactylus (Latreille). Generic Character.—Carapace nearly horizontal above and much less wide than in Thelphusa. Front wide, lamellar, and simply incised; orbits nearly circular; lateral borders of the carapace curved. Antenna disposed nearly as in Thelphusa: but the form of the external podia is very different, their third joint is nearly triangular, with its summit directed inwards, and it is articulated with the succeeding joint by its anterior and external angle.

* Thelphusa are the Greek Brave and Cyclomedes.

[But see page, p. 207.]
The example, Trichodactylus quadratus, the only known species. Length about 1 inch.

Locality—Brazil.

Mr. W. S. MacLeay, in his interesting paper "On the Brachyurous Decapods of the Cape" (Smith's Illustrations of the Zoology of South Africa), in a note to the sixteenth species (Thelphusa perliola, M. E.), remarks that this crab is common in all the rivers of Southern Africa, and grows to the size of nearly three inches long. "The male," says Mr. W. S. MacLeay in continuation, "has a much more convex shell than the female, and in aspect resembles much a Gogarora."

"The pearly tubercles of the anterior margin of the shell are also still more small and evanescent than in the female. I may take this occasion to observe, that in my cabinet I separate those species of Thelphusa which, like the present, have a transversal crest in front of the shell, and call them Potamonautes. They are easily distinguished from true Thelphusa, of which the type is the European species Thelphusa Thelwalli, of the size of the usual mussels."

THELWALL, JOHN, son of Joseph Thelwall, a silk-monger, was born on the 27th July, 1764, in Chandos-street, Covent Garden, London. He was the youngest of three children, two sons and a daughter. At an early age he manifested so much talent for drawing, that he was intended for an artist, but his father's decease changed his prospects before he had completed his ninth year. He received the ordinary education of a tradesman's son, but as he was rather slow in acquiring knowledge and was removed from school at thirteen years of age, his attainments must necessarily have been limited.

The widow continued to carry on her deceased husband's business; hence she placed her son John in the shop, where he remained three years, but spent his time chiefly in reading, which was of a miscellaneous character, consisting of poetry, history, the dramis, moral philosophy, metaphysics, and divinity. A distaste for the business, joined to family discord, induced him to leave it, and although he earnestly desired to be an artist or an actor, he yielded to his mother, who apprenticed him to a tailor, with whom however he remained only a short time. At the suggestion of Mr. Holt of the Chancery bar, who had married his sister, he turned his attention to the law, but after several years' study he abandoned it in consequence of doubts arising in his mind on the morality of a hired advocate pleading to support a cause rather than to discover the truth; and now, in his 22nd year, he embraced literature as a profession.

In 1787 he published by subscription poems on several subjects, in 2 vols., which introduced him to some valuable friendships and to the editorship of a magazine. He was now a rising and prosperous man, and on the 27th July, 1791, he married Miss Susan Veilum, of Rutlandshire, who was then 17 years of age. He took a house near the Borough hospitals, and ardently studied anatomy, physiology, and chemistry, under Mr. Cline, Dr. Heighton, and Dr. Babington.

He began his career as an orator, before he was twenty years of age, at the Society of Free Debate held at Coach- makers' Hall. He had been educated a churchman in religion and a Tory in politics, but on both subjects his opinions were changing, and he now joined in the political struggles of the period by becoming a member of the Corresponding Society, where his boldness and fluency of speech attracted the notice of the leading men of the day. With Thomas Hardy and John Horne Tooke [Horne Tooke] he tried for high treason, and acquitted.

The trial lasted five days. On his acquittal he lectured on politics and political history for several years, when, after a retirement of two years in Wales, made in order to disconnect himself from public affairs and to escape from extra-judicial persecution, he began his career in 1801 as a lecturer and tutor in eloquence, and in the application of eloquy to science the cure of stammering and other impediments to speech. His knowledge of anatomy and physiology, his habits of recitation, his practice of public speaking, and his accuracy of observation, eminently qualified him for his new profession, and his success was great. He communicated papers to the 'Medical and Physical Journal,' on defective and difficult utterance, and to the 'Monthly Magazine,' on elocution and its kindred sciences.

In 1816 Mrs. Thelwall died, leaving a family of four children, two of whom are in the same business. Mr. Thelwall afterwards married Miss Cecilia Boyle, by whom he has left one son. He died at Bath after a few hours' illness, of disease of the heart, to which he had been long subject, on the 17th February, 1834, in his 70th year. The researchers of his human speech, had left little room for new and brilliant discovery, although much accurate observation was yet necessary to give exactness and fulness to their knowledge. Thelwall, unaware of Steele's researches, found himself anticipated on rhythmus. Steele had given the inquiry a musical direction, which Thelwall ardently followed out, and the extent and precision of his observations may be estimated by the fact that he anticipated nearly all that is to be discovered in the Philology of the Human Voice. 'Mr. Thelwall's immature ideas were first sketched out in the syllabus of his lectures on elocution. Thelwall was a mild and amiable disposition, of domestic habits, open-hearted and generous, of high moral feeling, and of inflexible integrity. His sentiments were exalted by poetic feeling, and he was buoyed up by hope.

Besides magazine contributions and pamphlets, he wrote poems on several subjects, in 2 vols., in 1799, vol. 1: 'Poems written in the Tower and in Newgate,' 1 vol., 'The Tribune,' 3 vols.; and 'Political Miscellanies,' 1 vol.; 'A Letter to Mr. Cline, on Stammering,' 1 vol.; 'The Peripatetic,' 3 vols.; and a novel, entitled 'The Daughter of Adoption."

THE' ME'ON. [Foraminifera, vol. x., p. 349.]

THEMIS (Θήμης), a Greek divinity, was, according to Hesiod and ApolloDorus, a daughter of Uranus (Heaven) and Gaia (Earth), or, according to Diodorus, a daughter of Helios. She was a favourite of Zeus, and bore him several daughters,—the Horae, Eunomia, Dice, Eirene, and the Moraen. (Hesiod, Thog., 135, 901, &c.; ApolloDorus, i. 3, 1.) These personified abstractions, which are represented as her daughters, show the ideas which the ancients had formed of her character, and consistently with these ideas she appears in Homer as a personification of the order of things sanctioned by usage or by law, and as the goddess who rules in the assemblies of the people. (Hesiod, Odyss., ii. 28, &c.) According to the stories that she lived with the other great gods in Olympus, was on good terms with Hera, and occasionally assembled the gods at the command of Zeus. (Homer, Iliad, xxv. 67, &c.; xx. 4, &c.) Diodorus (v. 67) says that she was beloved by the gods and that they had made men acquainted with the will of the gods, the mode of their worship, and to have instituted laws, religious as well as civil. As a deity revealing the future she was believed to have been in possession of the oracles of Apollo. In the oracle after her death she was permitted to the time that it came into the hands of Apollo, whence the act of giving an oracle was, even in later times, frequently called by a word derived from her name (6µµη'ρείον). She was worshipped as the goddess of law and of custom, the protectress of Greece, as at Thebes, Olympia, Athens, Tanagra, and Troezen. She is frequently represented on coins in a form

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THE MISION, an antiquarian physician, who is probably best known to us for his medical advice on menstruation (Sat. x. 221)—

"Thomison agnovit sancti promissor us"

— while in reality the founder of a celebrated medical sect, and one of the most eminent physicians of his time. He was born at Laodicea in Syria, in the first century before Christ, and, from Juvenal’s argument, must have practised at Rome. He was a pupil of Asclepiades, from whose opinions however he afterwards disdained, and finished his life as a new medical sect, called the Methodic. (Flint, Hist. Nat., i. 153; C. de Gen. et Alg. Med. 4, tom. xiv. p. 683. 684, ed. Kühn; Cramer, Anecd. Gr. Paris., vol. i. p. 395, l. 26.) The following is the analysis of the opinions of this school, which is given by Celsus in the historical introduction to his work. They assert that the knowledge of no cause whatever bears the least relation to the method of cure; and that it is sufficient to observe some general symptoms of distempers; and that there are three kinds of diseases, one bound, another loose, and the third a mixture of these. The symptoms of sick people are too small, sometimes too large; and sometimes one particular excretion is deficient, while another is excessive. That these symptoms are sometimes acute, and sometimes so slight and sometimes so strong and sometimes so weak, that a stand and sometimes abating. As soon as then it is known to which of these classes a distemper belongs, if the body be bound, it must be opened; if it labours under a flux, it must be restrained; if the distemper be complex, then the method unconditionally must be twofold. And that one kind of treatment is required in acute, another in inveterate distempers; another when diseases are increasing; another when at a stand; and another when inclining to health. That the observation of these things constitutes the art of medicine, which they define as a certain way of proceeding, which the Greeks call method (μιθος), and affirm it to be employed in considering those things that are common to the same distempers: nor are they willing to despise themselves classed either with the rationalists (i.e. the Dogmatics), or with those who regard only experiments (i.e. the Empirics): for they dissent from the first sect, in that they will not allow medicine to consist in forming conjectures about the occult things; and also from the other that they hold the observation of experiments to be a very small part of the art. (Futowys’s Translation.)

What we know of his mode of treating diseases does not give us a very high idea of his skill in therapeutics. He thought that the greatest part of disease was due to violent incontinence of pneumatics, and toupo given me in oil and baths; in pleurisy he permitted the use of wine mixed with sea-water (Cael. Aurel., De Morb. Acul., lib. i., cap. 16, p. 62. 63); he recommended also violent exercise in several acute diseases (ibid., lib. ii., cap. 29, p. 144.) He is said by Sprengel (Hist. de la Méd.) to have been the first person who made use of leeches. (Id., De Morb. Acut., lib. iii., cap. 16, p. 232; Diocor. Theriac., cap. 1, p. 423.) He wrote several medical works, of which nothing but the titles remain. (Cael. Aurel., De Morb. Chron., lib. i., cap. 1, p. 285.; 1, p. 323.; ii. 7, p. 386, &c.) However, several of his works were preserved; among whom the most eminent were Soranus (Soranius). Thessalus (Thesalius), Caulius Aurelianus, whose work De Morbis Aculis et Chronicis is one of the most valuable of antiquity; and Moschion, author of the work Epist. rōv Pavnntiou καθορισμοι, De Mulierum Patulos. (Sprengel, Hist. de la Méd.; Fabrisius, Biblioth.Graec.; Haller, Biblio. Medec. Pract.; Biogr. Médicale; Dict. of Greek and Roman Antq., art. Methodist.)

* In this last passage the name is written Malphigius, which error is left unnoticed by the editor, but may readily be accounted for by recollecting that the works 1 and 9 of Rome bear exactly the same sound, and that for many centuries past (Greek words have been pronounced by the Greeks ac-

* The word in the original is πρεσφην, that is, a disorder attended with some fever.

Our author means the depth of a disease, after which it increases no more.

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THE

which was to be taken on sudden and extraordinary emergencies, and sagacity in calculating the consequences of his own actions; and these were the qualities which Athens during her wars was in most need of. His ambition was unbounded, but he was shrewd enough to foresee that it could not reach its end unless Athens was the first among the Greek states; and as he was not very scrupulous about the means that he employed for these ends, he was accused of aiming at the destruction of the city, and of having no heart but the welfare of his country; and no desire of personal aggrandizement.

In the year 483 B.C., when Aristides was sent into exile by ostracism, Themistocles, who had for several years taken an active part in Athenian affairs, was put to sea, and the authors of the banishment of his rival, remained in the almost undivided possession of the popular favour, and the year after, B.C. 482, he was elected archon eponymus of Athens. The city was at that time involved in a war with Aegina, which then possessed the strongest navy in Greece, and with which Athens was unable to cope. It was in this year that Themistocles conceived and partly carried into effect the plans by which he intended to raise the power of Athens. His first object was to increase the navy of Athens; and this he did ostensibly to enable Athens to contend with Aegina, but his real intention was to put his country in a position to meet the danger of a second Persian invasion, with which Greece was threatened. The mariners were content to accept the building of the fleet as a means of evading their service.

Hitherto the people of Athens had been accustomed to divide among themselves the yearly revenues of the silver-mines of Laurion. In the year of his archonship they were complained of by their countrymen also. In the meantime the Persian fleet arrived in the Saronic gulf, and the fears of the Peloponnesians were revived and doubled, and nothing seemed to be able to keep them together. At this last and critical moment Themistocles devised a plan to compel them to remain. He sent a message to the Persian admiral, informing him that the Greeks were on the point of dispersing, and that if the Persians would attack them while they were assembled, they would easily conquer them all at once, whereas they otherwise would be necessary to defeat them one after another.

This apparently well-meant advice was eagerly taken up by the enemy, who now hastened, as he thought, to destroy the fleet of the Greeks. But the event proved the wisdom of Themistocles. The unwieldy manoeuvre of the Persians was unable to perform any movements in the narrow straits between the island of Salamis and the mainland. The Greeks gained a most complete and brilliant victory, for they only lost forty ships, while the enemy lost three hundred and thirty. Very soon after the victory was decided, Xerxes with the remains of his fleet left the Attic coast and sailed towards the Hellespont. The battles of Artemision and Salamis occurred in the same year, 480 B.C. [SALAMIS.]

Coin of Salamis. British Museum. Actual Size. Silver

When the Greeks were informed of the departure of Xerxes, they pursued him as far as Andros without gaining sight of his fleet, and Themistocles and others proposed to continue the chase. But he gave way to the opposition that was made to this plan, and consented not to drive the vanquished enemy to despair. The Greek fleet therefore only stayed some time among the Cyclades, to chastise those islanders who had been unfaithful to the national cause. Themistocles, in the meantime, in order that the fleet complete its voyage about the Greek shore, and that the admiral should have a sufficient crew, sent a message to him, exhorting him to hasten back to Asia as speedily as possible, for otherwise he would be in danger of having his retreat cut off. Themistocles valued himself on the advantage to be derived from the purpose of enriching himself at the cost of the islanders, partly by extorting money from them by way of punishment, and partly by accepting bribes for securing them impunity for their conduct. His fame, however, spread over all Greece, and all acknowledged that the country had
been saved through his wisdom and resolution. But the confederate Greeks, actuated by jealousy, awarded to him only the second prize; at Sparta, whither he went, as Herodotus says, to be honoured, he received a chartel of olive-leaves,—a reward which they had bestowed upon Themistocles, the king of the Molossians. On his arrival, the king was absent, but his queen Pthia received him kindly, and pointed out to him in what manner he might win the sympathy of the Molossians. The king returned home. Themistocles, seated on the earth and holding the child of Admetus in his arms, implored the king not to deliver him up to his persecutors, who traced him to the court of the Molossians. It is stated that Themistocles was here joined by the ambassadors of Athens, who also granted his request, but provided him with the means of reaching the coast of the Egean, whence he intended to proceed to Asia, and seek refuge at the court of the king of Persia. With the help of his friends, he sailed in a boat up the coast of Asia Minor. At Ephesus he received such part of his property as his friends had been able to wreak from the hands of his enemies at Athens, together with that which he had left at Argos. A few months after his arrival in Asia, Xerxes was assassinated (a.c. 465), and was after a short interval succeeded by Artaxerxes. Various adventures are told of Themistocles before he reached the residence of the Persian king. On his arrival he overtook a letter, in which he acknowledged the evils he had inflicted upon Athens, and referred to his previous request claiming the merit of having saved him from destruction by his timely advice. He added that his present exile was only the consequence of his great zeal for the interests of his country, and that he now made a determined resistance against an attack that might be made upon them. His advice was followed, and Themistocles, after his arrival at Sparta, took no steps towards opening the negotiations, but pretended that he was obliged to wait for the arrival of his colleagues, and that he had reached a sufficient height, and when he could drop the mask with safety, he gave the Spartans a well-deserved rebuke, returned home, and the walls were completed without any hindrance. He then proceeded, carrying it effect the only thing which remained to be done to make Athens the first maritime power of Greece. He induced the Athenians to fortify the three ports of Phalerum, Munychia, and Piramus, by a double range of walls, and to connect Piramus by two long walls with the city of Athens.

When Athens was thus raised to the station on which it had been the ambition of Themistocles to place it, his star began to sink, though he still continued for some time to enjoy the fruits of his memorable deeds. He was conscious of the services he had done to his country, and never scrupled to show that he knew his own value. His ex- tortion and avarice, which made him ready to do anything, and which was not concealed, and which has often been supposed to be due to his selfish policy, were not to fail to raise enemies against him. But what perhaps contributed more to his downfall was his constant watchfulness in maintaining and promoting the interests of Athens against the encroachments of Sparta, which, in its turn, set its hand out for an equal opportunity to carry its own schemes. The great men who had grown up by his side at Athens, such as Cimon, and who were no less indebted to him for their greatness in the eyes of Greece than to their own talents, were his natural rivals, and succeeded in gradually supplanting him in the favour of the people. They also endeavoured to represent him as a man of too much power, and as dangerous to the republic. The consequence of all this was, that in 472 b.c. he was banished from Athens by the party which had fallen out with Athens in times past, and which had the ascendency. Before he was just resting when, in the same year a.c. 472, Pausania was put to death at Sparta for his ambitious and treacherous designs, and his late involved that of Themistocles. [Pausania's has been in their search to discover more traces of the plot of Pausania, found a letter of Themistocles, from which it was evident that he had been acquainted with his plans. This was sufficient for the Spartans to ground upon it the charge that Themistocles had implicated in the plot. The Spartans were forthwith sent to Athens to demand that he should suffer the same punishment as Pausania. This charge was no less welcome to his enemies at Athens than the discovery of his letter had been to the Spartans. Orders were accordingly issued to arrest and convey him to Athens. But he had been informed in time of the proceedings at Athens, and foreseeing that his destruction would be unavoidable if he should fall into the hands of his enemies, he fled to Coreya, and thence to the opposite coast of Epirus, where he took refuge at the court of Admetus, king of the Molossians. On his arrival, the king was absent, but his queen Pthia received him kindly, and pointed out to him in what manner he might win the sympathy of the Molossians. The king returned home. Themistocles, seated on the earth and holding the child of Admetus in his arms, implored the king not to deliver him up to his persecutors, who traced him to the court of the Molossians. It is stated that Themistocles was here joined by the ambassadors of Athens, who also granted his request, but provided him with the means of reaching the coast of the Egean, whence he intended to proceed to Asia, and seek refuge at the court of the king of Persia. He was said to have spent several years at the court, to have been received by the king, and to have held out prospects of conquering Greece by his means. The king became so attached to him, that Themistocles was always in his confidence. After he had spent several years at the court, he was sent to Asia Minor, to wait there for an opportunity of carrying his promises into effect. A pension was now bestowed upon him, and after the Oriental war, who, three hours would have grown him, of which Magnesia on the Maeander was to provide him with bread, Myus with meat, and Lampasus with wine. He took up his residence in the first of these towns, where he lived with a sort of princely rank. But death overtook him at the age of sixty-five, before any of his plans were carried into effect. Most of the ancient writers state that he put an end to his life by poison, or, according to another strange story, by drinking the blood of a rabbit. It is also declared of being able to fulfil his promises to the king. The manner of his death is somewhat questionable. Reflections on his past life and upon the glory of his former rivals at Athens are much more likely to have rendered him disappointed with life. Before he took his departure, he is said to have requested his friends to convey his remains secretly to Attica, and in latter days to a tomb which was believed to contain them existed in Piraeus. In the market-place of Magnesia a splendid monument was erected to his memory, and his descendants in the place continued to be distinguished by certain privileges down to the time of Plutarch.
The indication, perhaps, for being represented a blockhead, may be as strong in us as it is in the ladies for a reflection on their beauties. It is certain I am indebted to him for some flagrant civilities; and I shall willingly devote a part of my life to the honest endeavour of quitting scores: with this exception, however, that I will not return those civilities in his peculiar strain, but confine myself, at least, to the limits of common decency. I shall ever think it better to want wit, than to want humanity; and indignant persons may perhaps be of my opinion. It is to be feared that it was rather a new hatred than a sense of justice, however tardy, which induced Pope in 1743 to dethrone Theobald from the hercaphery of the 'Dunciad,' setting up Colley Cibber as his successor. In this year both Theobald and Cibber were at peace; death had for ever silenced their controversy. Theobald died in September, 1744. On the 20th of the following October, his plays, which included 200 old English plays, was sold by auction; and the same catalogue for the dunciad, now so rare and highly valued, at a time when our early drama was neglected, if not despised; and he made a judicious use of them in his edition of Shakspere. When we speak of his edition with commendation, we could not say that any were of so great a value as his; and we pass over those ebullitions of offended pride, venting itself in self-commendation and acrimonious objection, which were natural to one who had been so hunted by satire as Theobald had been. Dr. Johnson says that Theobald, 'by the good luck of having Pope for his enemy, has escaped and escaped alone with reputation from this undertaking [the undertaking of editing Shakspere].'

So will we make a more genial speech about. He solicits favours against those who command reverence, and so easily is he praised whom no man can envy.' This, we think, is mere phrase-making, and does not represent the world's opinion of any man at any period: reputations are not made upon the half-crown. Theobald has, a little before, stated the case with greater correctness, although not wholly correct. 'Pope was succeeded by Theobald, a man of narrow comprehension, and small acquisition; yet he produced an incredible splendour of genius, with little of the artificial man; his works of learning, but zealous for minute accuracy, and not negligent in pursuing it. He collated the ancient copies, and rectified many errors. A man so anxiously scrupulous might have been more content with what little he had, if he had known his right.' The great merit of Theobald as an editor is that he did not attempt too much, that he did not 'do more,' and that therefore 'he was commonly right.' The great fault of nearly all the editors of Shakspere has been that they set themselves up above their author; that they would exhibit their own 'native and intrinsic splendour of genius' in the improvement of what they did not understand, and the adaptation of the verse of Shakspere to the standard of their own age. He, however, almost the only admissible ones, have been produced by the caution of Theobald. In his own preface he says, 'I have not by any innovation tampered with his text, out of an ostentation of endeavouring to make him speak better than he is thought to say, and then he says, 'I have collated all the former editions, a passage has laboured under flat nonsense and invincible darkness, if, by the addition or alteration of a letter or two, or a transposition in the point, I have restored to him both sense and sentiment, such corrections, I am persuaded, will not in any wise be rejected by subsequent editors have a debt to Theobald which has not always been acknowledged. Johnson himself says, 'I have sometimes adopted his restoration of a comma, without inserting the siren phraseology in which he celebrated himself for his achievement.'

There is a curious matter connected with the history of Theobald, which needs here only a slight mention. In his edition of Shakspere in 1728, he printed a play, 'The Double Falsehood,' as an original by William Shakspere, it having been a short time before produced on the stage. The play was stated to have been found in manuscript. One passage, which is certainly not in the manner of Shakspere, is said to have been particularly noted in the text:

'\textit{Strike up, my masters}:
\begin{itemize}
\item But touch the theme with a religious knife:
\item Teach sound to languish through the night's dull ear.
\item 'Till malice and passion from his heart
\item And careless grew convert to situation.'
\end{itemize}

\textit{Vainhearts}.

The admiration was too much for the vanity of Theobald: he came forward to state that he certainly had written those lines, but that all the rest was genuine Shakspere. Dr. Farmer holds that 'The Double Falsehood' was not Shakspere's because the word \textit{aspect} was wrongly accented, that is, not as aspect, according to the usage of Shakspere and of his time; and he holds the play to be Shirley's. It is not worthy even of that writer. The probability is that Theobald had a greater hand in the matter than he was subsequently willing to acknowledge. The restless vanity and love of notoriety which, according to his own account, impelled Psalmanazar to his impostures, has perhaps in nearly every case been the great motive to every forgery. Theobald was the author of a Life of Sir Walter Raleigh; and he also wrote the greater part of the periodical papers entitled 'The Censor,' which appeared as a separate work in 1717, having been previously published in Miss's Weekly Journal.'

Theobaldus, a bishop who probably lived in France and whose name is sometimes written \textit{Theoboldus} or \textit{Tibaldus}, the reputed author of a didactic and theological poem entitled 'Physiologus de Naturis Duodecim Animalium.' It is written in hexameter verse, and describes first some one or more of the natural habits of twelve different animals, and then draws from each some moral and religious reflections. The twelve animals chosen are the lion, eagle, serpent, ant, fox, stag, spider, whale, sirens and centaur, elephant, dove, and panther; and the whole poem appears to be borrowed in a great measure by...
THE from the little work in prose by Epiphanius on the same subject. The poem begins thus:

'Tres lucis naturae et tres habit orbis aegreas, Anima mundi dominans animalia libii,

Arva divisi mortem animalesse iniit, Deni sui, praestantiumque membra novi,

Terrestre diversa a solum scribere metris. Namque modo complacet aliter vita solam, Nam leo stans fortis super alta cuneae montis.'

And ends thus:

'Sumnae & nomen ubi regiones Patrae present. Quaerens gentium cunea, sine vere condenda secundae Ant fugiit argai latae peti in igne tempore purati

Herba plumba, qui nobili est

Namque palam nullo feste undae futilae motus

Non alacrima, sed qui szech centuram. Carmine facto sae ista et gloria Christi, Cum sit non ali placentur hae montes Tiburti.'

The last two verses are not to be found in the old editions, but only in Beaugendre's edition of the works of Hildebert. With respect to the author of the poem, it is found in a Paris manuscript of the thirteenth century, containing the works of Hildebert, archbishop of Tours (who lived in the twelfth century), and has not been ascribed to Hildebert himself; he may be supposed to have lived some time in the twelfth century, or even as early as the eleventh, if he is the person meant in an epitaph on Magister Theobaldus Derveneis, written by Hildebert. (Hildebert, Opera, p. 1322, ed. Beaugendre.) The first edition of this work is inserted in a volume of which a copy is attached of Antwerp, 1842, 4to., but five others are enumerated by Choulant (Handbuch der Bücherkunde für die Altere Medicin), which were probably printed before this year. The last, a folio, separate form, was published in Leipzig, 1510, 4to., but it is inserted in Hildebert Cenomanensis, Episcopi, Turenensis Archiepiscopi, Opera, ed. Ant. Beaugendre, Paris, 1708, fol., and erroneously attributed to Hildebert. The Procmium and the chapter De plantationibus are inserted by Freytag in the 'Analyste Literaria de Libris Rarioribus,' Lips., 1752, 8vo. In some of the old editions there is appended to the poem a theological commentary, written in the style of the scholastic philosophy of the middle ages; the author is unknown, but it is not composed by Hildebert himself. (Choulant, loco cit.)

THEOBROMA (from θεός and βρῶμεν, the food of gods), the name of a genus of plants belonging to the natural order Sterculiaceae, the species of which yield the cocoa of commerce. They are trees with large simple leaves and with the flowers in clusters. The calyx is composed of 5 sepals; the petals are 5, lengthened into a strap-like form at the apex; the stamens are 5, each with double anthers and 3 spiral appendages on each filament; the style is filiform, with a 5-parted stigma; fruit a 5-seeded capsule without valves; seeds embedded in a soft pulp; no albumen, and thick oily wrinkled cotyledons.

Cacao, or Chocolate-nut tree, has entire, elliptic, oblong, succulent, quite smooth leaves, and oblong smooth fruit. This tree is indigenous in South America, and is generally found at a height of 600 feet above the level of the sea. It is however extensively cultivated in the West Indies, and in the tropical parts of Asia and Africa. The Mexicans call the tree 'chocolate,' hence our word chocolate for the prepared seeds. The capsules of the fruit are large, and contain each about 25 seeds; the pulp in which these are enveloped has a sweet and novel taste, and is the tree usually eaten where the tree is grown. The trees are evergreen, and bear fruit and flowers all the year through, but the usual times for gathering the fruit are in June and December. The cocation of the seeds contains a large quantity of oily albumen, which has an agreeable flavor, and on this account they are not only used as a principal article of diet by the natives of the countries in which they grow, but are now used for the same purpose throughout the civilized world. The composition of these seeds, in which an amylaceous matter is combined with oil, and a principle probably similar in its constitution to Thein and Caffeen, is well adapted, when combined with sugar, to form a valuable article of diet. The consumption of them for this purpose is already on the increase throughout the United States, and is greatly decreased the rate of duty will probably go on in a greater ratio. The following are the quantities consumed in this country since 1836:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1836</td>
<td>1,180,186 lbs.</td>
</tr>
<tr>
<td>1837</td>
<td>1,416,618 lbs.</td>
</tr>
<tr>
<td>1838</td>
<td>1,601,777 lbs.</td>
</tr>
<tr>
<td>1839</td>
<td>1,606,809 lbs.</td>
</tr>
<tr>
<td>1840</td>
<td>2,045,478 lbs.</td>
</tr>
</tbody>
</table>

Before the alteration of the tariff in 1842, the duty on cocoa from British possessions was 2d., and from foreign countries 3d. per lb.; now reduced to 1d. and 1d. On husks and shells the duty was 2d. and 2d., and remains unaltered. The duty on cocoa from British possessions was 4d. per lb. from British possessions, and 4d. from foreign countries, has been reduced in the former case to 2d., and in the latter to 6d. per lb. The duty on foreign cocoa under the old tariff was nearly prohibitory.

The economical use of different countries is made in its mode of preparation and the ingredients contained in it. The most common form however in which they are consumed in this country is what is called cocoa, which consists of the seeds pressed into flakes and sold to a paste. It is to this paste whilst hot that the honey, sugar, and other things are added, which constitute it chocolate. The paste is frequently adulterated. Hops' lard and sugar are added to make up weight, and red lead to give it a colour. On this account, especially in the country, the coffee is did not do its duty. The largest quantity of the seeds that are used in the country are brought from the West Indies, and of these the Trinidad nuts are considered the best. Of the 1,000,000 lbs. of cocoa consumed in 1836, 950,000 lbs. came from the West Indies, the remainder from Columbia, 186,000 from Brazil, and 133,000 from Chili.

The oil contained in the seeds is sometimes obtained separately, and called cocoa butter. It may be obtained most easily by expression, and is said to be very nutritive, and to act as an anodyne. It is particularly recommended for making ointments. (Each and Guerber, Allergem. Encycl., art. 'Cacao.'

In the cultivation of the Cacao a wet soil must be selected, as, if ever planted, it requires a great deal of water it perishes. The plants also require shade, and on this account in Trinidad and other islands of the West Indies the seeds are placed between rows of the Yruyana, umbrous tree, two, or three rows of the Cacao being planted between the Yruyana. In moving these the seeds are placed two or three together in the soil, at about two yards distant in the rows; and when the plants are about two feet high, all except the strongest are removed. In rearing them the only further care necessary in that all seeds are removed. If this be not attended to, the plant will not flourish.

There are several other species of Theobroma, yielding seeds possessing the properties of the above, but they are not cultivated, except employed to the benefit of all of them natives of South America, and used by the inhabitants where they grow as food. The Theobroma Guazuma of Linneaus, the Bastard Cedar or Orme d'Amérique, and Theobroma ulmifolia, is a native of the West Indies, and is a handsome tree resembling the Quercus; it has ovate, oblong leaves, smooth on both surfaces. In Jamaica cattle eat its leaves when fodder is scarce. Its pods have a sweet flavour like green figs, and are frequently eaten in the West Indies. Its wood is much used by coachmakers on account of its lightness. Its leaves and bark yield a mucilaginous decoction, which is reputed of much value in elephantiasis and in diseases of the chest. (Don's Miller's Dictionary; Dictionnaire des Sciences Naturelles; and Encyclopedie des Arts.)

THEOBROMA. (Cocoa and Chocolate.) The species of this genus which yield articles of nutriment are chiefly natives of South America and the West Indies. They are also found in the Philippine Isles. It is customary to order cocoa to the species described under Theobroma, but the yield only a small portion of this most widely consumed article, and none of that used in Mexico, where the T. Theobroma Cacao is grown. There is a species of Theobroma in the following furnish some of the different kinds of: T. theobroma, Wildenr.; T. tuberculatum, Mart.; T. spyraceum, Mart. The Mexican cocoa is conjectured by Decandol. to be yielded by T. angustifolia and ovalifolia, as well as from the undescribed species, or from the recently described species certainly from an undescribed species. The Columbian is yielded by a species called by the natives macante or...
symor, which is cultivated like the T. Cacao. The cocoa of Guiana is yielded by the T. Guianensis. (Aublet.)

Two fruits are collected from wild and cultivated plants; from the latter two harvests are obtained, from the former one only. The cultivation is easy and inexpensive. The tree begins to bear about the age of seven or eight years, and one slave can superintend a thousand plants, the produce of which however is not more than from 1500 to 1600 lbs. of seeds. The statement of Labat is an exaggeration—that a tree in full vigour will produce 150 lbs. of seeds. Notwithstanding the small return from each tree, it is a very lucrative branch of culture. The pods, when opened, are full of a yellowish pulp, and the latter is heavier than water. The seeds from the wild plants are obtained by the native Brazilians cacao bravo or cacao do Mato.

The fruits of the different species vary in size, form, and the number of the seeds they contain. The seeds, which are the only part employed, vary in size and quality according to the species from which they are obtained. The general number is from twenty-five to thirty in each fruit, being more abundant, as well as of better quality, in the cultivated than in the wild state. They vary much in bitterness and in the quantity of oil they yield, not only according to the species from which they are obtained, but in the manner in which they are treated after being gathered and taken out of the pulp fruit. In some instances the earth in which they are left to ferment for thirty or forty days; a process which greatly improves them, and destroys the germinating power of the seed. The different kinds met with in commerce derive their names either from the place where they grew or from some peculiarity of the fruit. The seeds of good beans is that of a sweet almond, but somewhat thicker. The most esteemed of the known sorts is that termed Soconusco, or Mexican, with very small beans, with a remarkably fine flavour, and scarcely any acid taste. These beans are always burned. This sort never comes to Europe. The next most valuable comes from Esmeraldas, and has a very agreeable flavour: the chocolate prepared from it has a golden colour; it is seldom met with in Europe. The beans of Guatemala are very large beans, very convex, often angular, and very much pointed at the one end. They contain much oil, and are mild, with a pleasant flavour. The beans from Guayaquil, which are three times as large as those of Soconusco, are less prized than those of Guatemala.

The Caracas or New Granada cocoa, which is among the more highly prized kinds that reach Europe, is obtained from the Theobroma bicolor (Humboldt, Pl. Aquin., t. 30), called by the natives Baco, and cultivated at Carabobo, on the GuayanaILLA, cloves, cinnamon and pepper, the sugarcane, and the chocolate made of these alone is not very agreeable, and another kind is commonly mixed with them, which are much smaller and harder. Berbece cocoa beans are not unfrequently mingled with those of Granada. These are also readily distinguished, but in other respects are difficult to distinguish; the shell separates very easily from the kernel, which is reddish-brown, and has a strong smell, but a pleasant flavour.

The Surinam and Essequibo cocus are not unlike that from New Granada, but are harder, thicker, and not so sweet.

All the foregoing are earth-dried: the following are called sun-dried, being merely collected in heaps, and often superintended over in the sun; they are consequently much cheaper.

Brazilian, called also of Para, and of Maranham, is very extensively employed: the beans are small, smooth, long, somewhat flattened, externally reddish-brown, with a bitter aspect. The pulp of the bean is brown, and the smallest portion of which is put over the fire is called "bean meal." These proportions vary very much in the different sorts the West Indian kinds containing far more of the oil or butter of cocoa than the kind from New Granada. It is therefore most advantageous to employ the latter to form cocoa or chocolate for nutriment, and the other to yield this solid oil, to form candies, soap, or pomades.

This oil contains a large proportion of stearine, and is therefore solid at the ordinary temperature; but it melts at 122° Fahr. When purified by long boiling in water, it is perfectly white, and does not readily become rancid. It is perfectly soluble in either, a means of detecting adulterations with beef-fat, suet, marrow, or almond oil. Burt, &c. It is said to be worth less than one third as much as the same quantity of palm oil, or than in France. Nevertheless it is a most valuable material, and a soap made with it and soda, which is preferable to potassa, forms an article for the toilet of great service to those who are troubled with a rough harsh skin or chalky hands. The solid oil of cocoa-nut is not to be confused with that just spoken of, as this is obtained from the Cocos nucifera.

The cocoa-nut oil is likewise prepared from the latter tree.

The kernels of the Theobromas are used as an article of nutriment either in the natural state as they are received from America or prepared in various ways. The simplest and best form is that of the seeds roughly crushed, termed cocoa-nibs, which however require two hours boiling, as, owing to the peculiar nature of the endosperm, or inner seed-coat, which passes down into the substance of the cotyledons, the prolonged application of heat and moisture is necessary to dissolve the contents. Flaked cocoa is the only seeds which lies between flaky and meal; it is late to be made, the beans being carefully picked so as to free them from moldy or worm-eaten ones, are to be gently roasted over a fire in an iron-cylinder, with the view that the volatile matters in the hull the aroma begins to be well developed, the process is considered complete. The beans are then turned, cooled, and freed by fanning and sieving from their husks. The husks, which often amount to 20 or 25 per cent. of the beans not be thrown away, should be well dried, in order to contain half their weight of soluble matter of a mucilaginous nature, which furnishes a tolerable nutriment for the poor. The seeds are then to be converted into a paste, either by triturating in a mortar heated to 130° Fahr., or more simply by stirring over a fire. (See Ure's Dictionary of Arts, &c., p. 293.) The paste is then put into moulds and sent into the market. It always improves by keeping. The colour is said to be owing to the addition of annatto, but this is probably a mistake, for if the South American contain as much colouring-matter as the West Indian, any extraneous pigment is unnecessary. When the kernels alone are used, or only a little sugar added, the chocolate is termed Chocolat de santé. But when the cocoa nibs are used, they are either sweetened, or made into chocolate with more sugar added; as are also rice, almonds, starch, &c. Simple chocolate is mostly preferred in Britain, the perfumed sorts in France, Italy, and Spain, in which countries the consumption is immense. For invalids the plain chocolate is best, and the perfumed variety, especially by a machine impregnated by steam. Theobromine by Woskresensky shows how nearly he was correct, and also that this article, being one of the most highly oxidised vegetable compounds, must be highly nutritious. Liebig considers that this principle contributes to the formation of bile, like them. [Thea; Thein.]

THEOCRACY (Gosporia, a government by God), is a form of government, as established by Moses, on account of its being under the direct control of God. Michaelis enumerates the following particulars as those in which the theocratic form of government is most remarkable.

1. The laws of this government are of the most holy and pious; they are presented as holy persons, and as sitting in the place of God. 3. The judges were usually taken from the tribe of Levi, and the chief expounder of the law was the high-priest. 4. In difficult cases of law, relating both to...
government and war, God was to be consulted by Urim and Thummim. 5. In matters which concerned the welfare of the state, God often made his will known by prophecies, and the people were of course bound in duty to obey their voice. 6. God bound himself by promises and threatened to reward them with prosperity, victory, and plenty, if they kept the law of Moses, and to punish them with defeat, and other public calamities, if they disregarded it. 7. The collection in the earliest form of the Israelitish constitution, God was their king; and the desire of the people to have a king at the time when Saul was raised to that office is expressly declared to be an act of rebellion on their part. (1 Sam. viii, 7.)

THEOCRITUS (Θεοκρίτος) was a son of Simichidas, or, according to others, of Praxagora and Philina. He was a native of Croton, where he spent the greater part of his life. He is said to have been connected with Philetas of Cos and Asclepiades of Samos, and to have been their pupil, whence we may infer that he visited these islands. He was on very intimate terms with Anius and Tullus. At an early period he formed this acquaintance in the island of Cos. (Wiestbaum, Argument. ad Theocrit. Idyl. vii.) His exact period is not known, and we can only say that he lived in the reign of Ptolemaeus, the son-in-law of Kaisar, and Philetas, and that the time of his greatest reputation was about the year B.C. 277. Some years before this time, probably about B.C. 284, he had visited Alexandria, and the influence of the court of that city is manifest in several of his poems. It has further been supposed, but it is not probable, that he spent some time at Croton in Southern Italy, because the scene of three of his poems is laid in that place. Beyond these circumstances, which are little more than probabilities, we know nothing of the life of Theocritus. The Alexandrinum grammarians valued his works exceedingly, and assigned to him the second place in the pleiad of the seven miscellaneous poets, which comprised Lycophron, Theocritus, Callimachus, Aratus, Apollonius Rhodius, Nicander, and one Homer, the son of Moero of Byzantium. Several Greek grammarians also wrote commentaries on the works of Theocritus; some fragments of which are still extant in the scholia on his poems. There is extant by Theocritus a collection of various poems, which are written in what the Greek grammarians call the new Ionic, which is softer and more graceful than the old Doric; but the softness of this new Doric is still increased in the poems of Theocritus by the admixture of epic and Ionic or Aeolic forms. The particular species of poetry by which he has acquired most celebrity are the Bucolics (μποκλικαί). This pastoral poetry was very popular in Sicily, and having been originally cultivated by shepherds and rustics, was raised to a really artistic rank by several poets before Theocritus. He however brought this kind of poetry to perfection, and the ancient critics regard him as the model of bucolic poetry, and Virgil, in this reason calls this poetry Syracusan (Elog. vi, 1.). But the number of real bucolic poems still extant in the collection which bears the vague name of Idyls (ἰδύλλια), is very materially lessening twofold; the Idylls, such as idyl xi., xx., xxxiv., xxv., are imperfect; and the others, such as idyl xx. Besides these thirty Idylls, Theocritus has ascribed to himself two epigrams, which are called Berenice, and twenty-two epigrams, which are ascribed to Theocritus. All the poems which are genuine productions of Theocritus have been a part of the master of his art. His power over the language is not less wonderful than the taste for the simple beauties of nature, and the skill with which he handled his subjects. His poems are indeed founded upon the national shepherd songs of Sicily in the form of dialogues, but he has added features of his own, and idealized his persons, without depriving them of their natural simplicity. We do not know whether Theocritus himself published a collection of his poems. But from the epigram in the "Anthologia Graeca," x., 255, we might rather suppose that the collection was made by Artemidorus, the author of that epigram. It is however a curious fact that none of the MSS. of Theocritus, which are published in the various printed editions under his name. The edition princesse, which appeared at Milan in 1433, fol., only contains eighteen idylls of Theocritus, with the works of Hesiod and Isocrates. The editor was perhaps one of the learned monks of the monastery of J. Reiske, with a Latin translation, the Greek scholia and notes, Leipzig, 1765, 2 vols. 4to.; Thomas Watson, with additional scholia and notes, Oxford, 1770, 2 vols. 4to.; Valckenaer, Leyden, 1779 and 1781. The edition of Valckenaer, which also contains the poems of Moschus, is still valuable. In 1773 Valckenaer had published an excellent edition of select idylls of Theocritus. His complete edition was reprinted at Berlin, 1810, 2 vols. 8vo., with additional notes by Brunnck and Toup. After this date an ever increasing number of scholars have been engaged in the study of the works of Theocritus, and it is now considered a subject of the first importance that they should be translated into all the languages of modern Europe. There is an English translation by F. C. Moschus, Paris, 1797, and a translation, including Dion and Moschus, by W. G. Boucicaut, London, 1801. The best French translation is that of J. B. Gaill, with explanatory and critical notes, Paris, 1808, 3 vols. 4to. The best German translations are those of J. H. Voss (Tubingen, 1808, 8vo.) and Witte (Hildburghausen, 1818, 8vo.) was the first to take up the character of the poems of Theocritus, followed by Roemer (Leipzig, 1770, 8vo.) and Tallman, De Thueocriti Carmina, Lipsiae, 1793, 4to.; and Reinholt, De Thucriti Carmina, Genuinae et Supposititibus, Jena, 1819, 8vo. The British Theodolite, or THGD (as it is sometimes found in both forms), is the name generally given to the instrument used for measuring horizontal angles. In its simplest form the theodolite consists of a divided circle, which is to be set parallel with the horizon, and a telescope, which is carried by the observer to view any object which he may require, or below the horizon. The derivation of the word is obscure, although the instrument and its name are completely independent of each other. The original shape of the divided circle, which they called astrolabe, astrolabium, was used for the purposes of surveying, but these were, generally speaking, very rude. The quadrant was employed in accurate surveys up to the latter half of the last century, but the theodolite had shown by remote the superiority of the entire circle. (Circula.) The last instance of a survey conducted with an entire circle, on a considerable scale, was, so far as we recollect, the Survey of Zealand by Bugge,* in 1702-8. The horizontal circle was two feet in diameter, and constructed by the Danish artist Ahl.

Ramsden finished his great theodolite in 1787, the circle of which is three feet in diameter. This was used for a triangulation, to connect the Observatories of Greenwich and Dublin. A very full account of the theodolite is given in "An Account of the Operations carried on for establishing a Trigonometrical Survey of England and Wales," London, 1799, pp. 107-130, with four plates: a reprint, as a sixpenny book, was made, from the Phil. Trans., vol. 80, eq. 3. The principal triangles of the English, Irish, and Italian surveys have been observed with this instrument or with those nearly identical in use and construction; and though several minor additions and improvements have been made, the great theodolite is still the instrument of the officers of the survey as a most efficient and almost infallible instrument. We believe that the high reputation in the great theodolite depends in a great degree on the superstitions case with which it has been used and perceived. It is undoubtedly an instrument of the finest construction, and the more so, because the distinction of a survey is not in the absolute accuracy of the numbers itself, but in the clear, fast, and instant apprehension of the whole extent, which the theodolite almost permits us to get without any calculation. It is consequently of immense value in laying out the routes of roads, canals, and railways, and in those cases in which the absolute and certain accuracy of the numbers is of no importance, but in which it is more necessary to have the survey conducted as far as possible without calculation. A great many theodolites have been made in this country, in France, in the United States, and in many other places; but the great theodolite is still the standard of all the rest.
We have given here a sketch of the theodolite in its simplest form, such as would be proper for the secondary triangulation of a national survey, or for the most accurate private survey. The tripod which carries the instrument rests with three foot-screws in brass notches let into the top of a wooden stand. The legs of the stand are not fully represented, but the two parts of which each is composed end below in a strong and sharply-pointed metal socket. The circle is fixed, and the upper works, telescope, verniers, levels, \&c., turn on a centre, which may be seen just under the cross of the telescope. The adjustments are very simple. The wooden stand is first set down with a good opening of the legs, and the top nearly horizontal. The foot-screws are placed in their notches, the plumb-line hung from its hook, below the centre of the circle, and the telescope turned round till one level is parallel to the line joining two foot-screws, while the other level is in a line from the third foot-screw to the centre. Bring the bubble of the first-mentioned level into the middle by raising one of the two foot-screws and depressing the other, and then adjust the cross-level by raising or depressing the third foot-screw alone. Now turn the telescope round 180°, and if the bubbles are not in the middle, bring them half way there by touching the foot-screws, and the other half by screws which adjust the levels themselves. When this has been nicely done, the bubbles will remain in the middle in every position of the telescope. If the objects to be observed lay all in the horizon, or in a plane parallel to it, the above adjustment would be sufficient; but when the objects are out of the horizontal plane they must be referred to it by a perpendicular, which is the plane described by the telescope must be a great circle, and must also pass through the zenith. There are generally two wires at least in the focus of the telescope, one horizontal and the other vertical. Place the eye-piece to give sharp vision of the wire, and turn the mill-screw, seen towards the object-glass, until the objects you are going to observe are distinct. Place the vertical wire on any well-defined object, making the bisection near the crossing of the wire; raise or lower the theodolite so that the object is nearly at the bottom or top of the field; if it is still bisected, the wire is rightly placed, but if not, twist the tube carrying the eye-piece so as to effect a bisection. Make the telescope describe a great circle; select some well-defined object near the horizon, and take the telescope very carefully out of its Y's, reverse it, and look again at the object. If it is still bisected, there is no error; but if not, the bisection is to be effected half by the tangent-screw of the instrument and half by the screws which carry the wire-plate, screwing up one and releasing the other. Restoring the telescope to its first position, it will be seen whether the adjustment is correct, and if not, the process must be repeated until the bisection is the same in both positions of the telescope, the tangent-screw and tangent-screw remaining fixed. For the adjustment of the axis of the telescope a level would be convenient, but in this instrument the axis is supposed to have been correctly placed by the maker. The only mode of correcting any error is by filing the Y’s. It may be ascertained whether the axis is tolerably correct as follows:—Bisect an object as far above or below the horizon as the motion of the telescope will allow. Reverse the telescope, and if the object is still bisected, the pivots of the telescope are of the same size: if not, the observer must deduce the difference of the pivots from the altitude and the error observed, which is not difficult. When this has been satisfactorily executed, bisect, as in the last instance, an object as far as possible from the horizon, and read off the error. To find the instrument round 180°, return the telescope end for end, bisect the object again, and read off the verniers. If the mean readings differ exactly 180°, the axis is horizontal; but if they do not, the observer will have sufficient data from this, and the altitude or depression, for determining the quantity and direction of the error, which he may correct by the file or by calculation, according to his pleasure. There is a much easier method of examining the position of the axis by observing an object close, and as seen by reflection from a fluid, as mercury, oil, or water. The axis is truly horizontal when the vertical wire bisects the object and its reflected image without moving the tangent-screw. It must be recollected that the adjustments of the horizontal circle already described must be previously and very scrupulously performed before attempting the examination or adjustment of the cross-axis.

As the objects in a survey are at very different distances, an adjustment is required, performed exactly on the wires. The use of the mill-screw, seen towards the object-end of the telescope for this purpose, has already been mentioned.

In use, this theodolite should be placed on a repeating-stand or tripod, some of the parts being figured and described in Repeating-Circle, and the repeating-tripod upon the stand. This was not done in the present plan for the sake of clearness. To adjust the repeating-tripod, place the levels as described in the first adjustment, and clamp the theodolite. Bring the foot-screws of the theodolite over the foot-screws of the repeating-tripod by the motion of the tripod, and then by touching the foot-screws of the tripod or theodolite set the level-bubbles in the middle. Turn the upper plate of the tripod half-round, and again adjust the bubbles into the middle, half by the tripod foot-screws, half by those of the instrument, and repeat the operation until the revolution of the repeating-table does not alter the position of the level-bubbles. The repeating-tripod is now clamped, and the instrument itself is to be adjusted exactly as we have described above.

The course of observation after the instrument is adjusted is very simple. The problem is to measure the angle between two objects, or the angle of two or three times round the direction in which you intend to observe, then bisect one of the objects, read off the verniers, and take a mean; bisect the second object, read the verniers, and take a mean. The difference between the two means is the error. This is all that can be done by the instrument as usually mounted; but with a repeating-table the operation is continued thus. Bring the telescope back on the first object, by the motion of the repeating-table, using its clamp and tangent-screw, and by the motion of the instrument bring
the telescope on the second object. It is clear the motion of the repeating-table has merely restored the telescope to its original direction, without altering the readings of the circle; and that if the telescope be turned on the second object by its motion alone, without distributing the circle, the error in the mean of three or four new readings and the preceding mean will also be the angle required. By continuing the process, the angle may be measured as often as the observer pleases. It is evident that all readings-off, except the first, are superfluous, or giving the means of estimating the accuracy of the final result. The series should terminate after a whole number of revolutions as nearly as possible, when the excentricity of the repeating-table will be of no importance, inasmuch as the angle if the objects are near and the repeating-table carelessly made, or, if the objects are pretty distant and this caution superfluous, when the verniers are nearly at the divisions at which you set out, which gets rid of or at least diminishes any errors of division. The latter condition is however rather a speculative than a practical one. As the error of division is divided by the number of observations, and the casual error of observation only by the square-root of the same number, it is evident that many repetitions of excellently-divided circles will reduce the error arising from mal-division to a much smaller quantity than that which belongs to the class of casual error of observation.

The repetition of observation is, that the motion of the theodolite shall not disturb the repeating-table. The motion of the latter therefore should be as heavy as will admit of nicety in the tangent-screw, while the motion of the parts which move with the telescope should be as light and as free from all other errors; and if they are not, the observation should be repeated and varied until the quantity and probable law of the error is ascertained. We should then be able to say decidedly where, when, and under what precautions repeating was a safe and accurate and economical measure, which is the present is rather a vexata quies, unless the decision be supposed to be against all repetition, to which we do not bow.

The foregoing description has been confined to a form of theodolite which is not in ordinary use, though from its simplicity and power it is well adapted to the purpose of explanation. The common theodolite is generally carried by a pair of parallel plates, fixed on a three-legged staff. The lower of these circular plates is screwed upon the staff, and has an aperture above the screw. The upper plate has a strong descending shank which passes loosely through this aperture. A button of a spherical form is fixed on the end of the shank, the curvature uppermost, and two screws on the upper side of the lower plate, which is dome-shaped to fit it. Four strong screws pass through the upper plate and abut with their lower ends against the lower plate. When the staff is raised, the plates bear against each other, and the spherical surface on which it rubs are brought into squeezing contact. To level the theodolite, set the levels each parallel to a diagonal pair of screws of the parallel plates. Then screw one pair until you come to a bearing, and by releasing one and raising the other, and not very tight, set the corresponding level horizontal; leaving this pair and taking hold of the other pair set the second level also right, and if the first level is deranged, as it usually is, a little, restore it by correction by screwing up the proper screw. Turn the telescope half round and correct the error, half by the parallel plate screws, and the other half by the level-adjustments themselves. It is desirable that, when the final adjustment is made, the same person who has worked the instrument by screws, has the chance that the upper plate will turn a little during the observation. This objection would seem fatal to the use of parallel plates where great nicety is required: they are however very convenient and of very ready use, and perhaps if the screws are strong and the observer is careful to give the telescope three or four turns round in the direction he means to observe, before starting, and always move the telescope the same way, serious error may be avoided. The fact, object witherved should always be observed at the end of the service, in order to see whether there has been any change in the original position. If one of the screws rest in a notch, perhaps the tendency to that motion may be overcorrected.

Another contrivance which is to be found in almost all theodolites is much more objectionable. The surveyor wishes to save himself addition or subtraction, and requires an adjustment by which he can turn the whole circle. But, as a matter of common sense, the object, the verniers being previously set to zero. There is therefore a motion with a clamp and tangent-screw for this purpose, which, as the clamp has usually a very short bearing, is particularly liable to yield and so destroy all accuracy. To remedy this unnecessary evil a second or watch telescope, as it is called, is attached to this part of the instrument and brought to bear upon a well-defined object. Any motion or wriggling of the telescope or numbers by which the angle is ascertained is then cut out. If an error is made in the angle is taken, it must be first ascertained whether the watch-telescope keeps its position, and the position if disturbed must be restored to the zero tangent-screw; before the observation is finally made. In some theodolites made for the survey and intended for the measurement of the great heights of Mount Everest, the zero and slow-motion clamp take the form of a repeating-table, and may be so applied. It would be safer to have this motion made considerably heavier that in the patterns we have seen, and if the instrument is like this will fall out of the horizontal line, the weight on the object may be added for greater caution. Such a theodolite would, as far as we can judge, have no limit to its accuracy, except that depending on the diminutive telescope.

For an instrument to be practicable it is reasonable that the telescope should allow of being considerably elevated or depressed, and that means should be given for measuring this angle with considerable accuracy. A circle, or portion of a circle, is then fixed upon the telescope axes and the necessary verniers and level may be secured by a taper piece or otherwise to the support. If the vertical angles are to be measured as accurately as the horizontal angles, the instrument becomes an altitude and azimuth circle. To enable such instruments to be used it is necessary that the meridian be determined in the Ordinance Survey by observing Polaris at its greatest elongations E. and W., and taking the middle of the two readings for the direction of the axis. In order to do this, the telescope and its attachments except that for azimuth (TRANSIT) are considerably elevated above the circle. The results were upon the whole satisfactory, yet we cannot doubt the presence of catastrophe this fundamental and delicate point from such an instrument, or of the steadiness of the telescope supports by raising them so much above the body of the instrument. It would have been better, we conceive, to have determined the direction of the meridian by a series of careful transit observations, using more optical power with greater steadiness, and to have kept the theodolite to its proper office, that of measuring horizontal angles, greatly reducing the height of the telescope supports. The great theodolite had originally been fixed for the purpose of the telescope, for measuring altitudes and depressions. This has been properly, been removed, and a whole circle substituted. Where a theodolite is merely used for surveying, the telescope requires only a moderate vertical range. Mr. Troughton fixed a portion with a circle (which may be properly called a slice than a sector) to one or two his 12-inch theodolites, and this construction is often found in other makers. The telescope is thus kept lower, the instrument is firmer, and the larger radius gives the portion of the circle containing advance and a smaller radius. There is however something very unsatisfactory in a portion of a circle, and we should prefer a sort of compromise, giving the supports such an elevation as would most easily, if not very hard, carry the lines of the horizontal circle: if the direction of the meridian is to be determined by this instrument, the supports must be at least so high as to see 2° or 3° above the base.
It may be as well to mention here that the principal adjustment being that of setting the plane of the teodolite horizontal, or, more correctly speaking, the principal axis vertical, any horizontal level anywhere placed is sufficient for the purpose, though the cross-levels are a great deal of unnecessary trouble by being very difficult to check. The extremities of the circle are found with error of division. The English dividing- engines, up to the present time, do not divide the circles upon their centres; and therefore it frequently happens that the vernier or horizontal circle is wrong, round which it is divided. When this error is not absolutely monstrous, the only effect is that one vernier gains whatever another loses, and that the mean of two opposite, or of three, four, or more equidistant readings, is precisely the same as if there were no eccentricity. The advantage of a little eccentricity is, that it gives you the benefit of an unbiased reading at every vernier as well as the first: again, if all the verniers are recorded, it is a check on the observer. He might read one vernier and set down the rest. The instrument-maker, ignorant customer, and so either hammer his circle after it is divided, which may deform his work, or have an adjustment, which injures its solidity.

Mounts and several others which have been made, the circle is read off by micrometer microscopes. Sometimes the microscopes revolve with the telescope (as the verniers do in our figure); sometimes the microscopes are fixed, and the circle revolves with the telescope, as in the horizontal instrument made by Mr. Eretf of Munich has made several astronomical theodolites in which the rays entering into the telescope are reflected along the horizontal axis by a prism. The observer looks at the end of the micrometer, and the vernier is marked with the object to be inspected, and then set down again. The operation is in fact the same, whatever be the nature of the vertical arch, and the adjustment is to be effected either by altering the level or the horizontal wire until the reading is the same in both positions. When the point reaches the zero, or collimator, he can set the cross of his level-wires horizontal, and this being bisected by the telescope of the theodolite, the vernier must be made to read zero, and the bubble of the level ought to be within the middle by its proper screws. Or if the observer possess two stands (there is a great convenience in having more stands than one in surveying), he may place the stands at a considerable distance from each other, and, fixing the instrument on one stand, the other obtuse or acute a circle, and the observer mark the object to be bisected, and re-serve the observation. Now extending the instrument and mark, he must reobserve the depression or elevation exactly as before. On drawing the figure, it will be seen that if light makes the error of the vernier, which is corrected according to the circle, or position of the object to be bisected, and then set down again. The operation is in fact the same, whatever be the nature of the vertical arch, and the adjustment is to be effected either by altering the level or the horizontal wire until the reading is the same in both positions. When the point reaches the zero, or collimator, he can set the cross of his level-wires horizontal, and this being bisected by the telescope of the theodolite, the vernier must be made to read zero, and the bubble of the level ought to be within the middle by its proper screws. Or if the observer possess two stands (there is a great convenience in having more stands than one in surveying), he may place the stands at a considerable distance from each other, and, fixing the instrument on one stand, the other obtuse or acute a circle, and the observer mark the object to be bisected, and re-serve the observation. Now extending the instrument and mark, he must reobserve the depression or elevation exactly as before. On drawing the figure, it will be seen that if light makes the error of the vernier, which is corrected according to the circle, or position of the object to be bisected, and then set down again. The operation is in fact the same, whatever be the nature of the vertical arch, and the adjustment is to be effected either by altering the level or the horizontal wire until the reading is the same in both positions. When the point reaches the zero, or collimator, he can set the cross of his level-wires horizontal, and this being bisected by the telescope of the theodolite, the vernier must be made to read zero, and the bubble of the level ought to be within the middle by its proper screws.
judy of Antioch (about 369); but his friend Chrysostom, who was then a monk, persuaded him to choose the monastic life. Theodore was for some time a priest at Antioch, and afterwards bishop of Mopsuestia, an ancient town of Cilicia (394). In the same year he was present at the council of Constantinople. He died in 429, at a very advanced age, and after he had discharged his episcopal functions during thirty-five years. During fifty years he was known as one of the most learned writers in the church, especially by his works against the Nestorians, Pelagians, and other sectarians. His zeal however for the Catholic faith did not save him from the charge of being an adherent of the doctrines of the Nestorians, and he was obliged to write two fragments of his work in praise of the Nestorians continued to quote his works, and to call him the support of their faith; and this was the cause of his works, or perhaps only part of his works, being condemned by the Fifth Council (681). Theodore of Mopsuestia is said to have written largely on divinity and morals. Few of his writings have come down to us; others exist in Syriac and Latin translations, and of the greater part there are only fragments. A treatise on the Magi of the Persians, and his commentary on the Psalms, The Book of Job, and the Song of Solomon, are lost: his commentary on the twelve greater prophets is preserved in MS., according to Fabricius, under the title of Theodoret's Aramaic prophecy, in the Bibliotheca oriental. A catalogue of the works which have been preserved in the fragments of which he has given in Fabricius is contained in the Syriac translations are mentioned in Aem anus's Bibliotheca oriental. Theodoret of Mopsuestia is still one of the first theological authorities among the Syriac Christians. (Fabricius, Bibl. Graeca, x. p. 346-362; 346, note a; 347, note o; 352, note gg; 355, note kk; p. 748: Tillemont, Mem. Eccles., vol. xii.; Cave, Script. Eccles., vol. iii.).

THEODORUTUS, or THEODORITUS, a theologian and church historian, was born about 383 A.D. He was brought up under the care of a pious mother, to whom he acknowledged his obligations in his writings; and he had instruction from Theodore of Mopsuestia and John Chrysostom, and was accustomed to follow, to which he was sent to receive his education when not quite seven years old, and where he had for his fellow-pupils Nestorius and John, who were afterwards patriarchs of Constantinople and Antioch. Theodoret became a deacon in the church at Antioch, and in the year 423 he was chosen bishop of Cyprus, and died in Syria, near the Euphrates. His diocese abounded with Marcionites and persons who held heretical opinions concerning the Trinity. Against the opinions of these heretics, he wrote many books, with that, according to his own statement, he baptized ten thousand Marcionites.

In the year 431 Nestorius was condemned by the council of Ephesus [Nestorians], whose decision gave great offence to the Oriental Christians, who, who, being avowed followers of Nestorius, were supposed to be not unfavourable to his opinions. Among these was Theodore, who was a personal friend of Nestorius; and he was one of the persons who opposed the council of Ephesus had broken up, and condemned its proceedings. A reconciliation was however effected between Cyril, patriarch of Alexandria, the great enemy of Nestorius, and John, patriarch of Antioch, the leader of the Oriental party, and a settlement was agreed between Cyril and John, to the effect that Cyril should write two statements of the controverted point of doctrine, while John gave an appeal of the sentence passed on Nestorius. With this agreement Theodoret and others of the Oriental party were greatly dissatisfied. Theodoret at the appeal of the discontents in the agreement, but he warmly protested against John's consent to the condemnation of Nestorius, as an act of unmitigated injustice. He expressed these feelings in a letter to Nestorius, in which he accused John of being in imperial edict, proceeded to take measures against the more discontented partisans of Nestorius, Theodore considered himself bound to submit, both for the sake of the peace of the church, and because of his own approval of the doctrine which it was his business to defend. His means were used in his power to induce the friends of Nestorius, namely, Meletius, bishop of Mopsuestia, Alexander of Hymettus, and Helladius of Taras, to submit to John; and, upon their rejection of his advice, he offered no opposition to their being deposed. But when, in the year 435, new and severe edicts were issued against the Nestorians, Theodoret refused to carry his submissiveness any further; and, by his firmness he incurred the hatred of Cyril, to whom he had already been opposed in this controversy, and between whom and Theodoret such a better existed, that when Cyril died, in 444, Theodoret made no secret of his joy at the event. He was, however, a personal friend of Meletius, from whom he received the character of the man and from the Christian spirit with which he elsewhere speaks of Cyril's death, Theodoret's joy on the occasion sprung from a belief that the divisions which had been kept alive by Cyril would die with his death, and that peace would be restored to better the Church. Cyril was succeeded by Dioscorus, a man so haughty and impetuous as himself, and quite as unscrupulous. The new bishop followed up his predecessor's plan of enforcing the whole Eastern church to the coexistence of the Deity and humanity into one nature in the person of Christ; and perhaps he also kept in view the object of obtaining a kind of supremacy for the see of Alexandria. Determined to admit of no compromiss, he made his first attack upon Cyril's doctrine, a his the Syrian churches, which was headed by Theodoret. Dioscorus was supported by a large party in Syria, chiefly consisting of monks, whose leader was an abbot named Narsus; and at Constantinople many monks, the most of whose number were introduced from Syria, were in favour of the Cyrilian doctrine, on the ground that it alone was consistent with the simple letter of Scripture, 'The Word became flesh,' and other similar expressions. These Constantinopolitan monks were a most important party in the dispute, partly from their close connection with the anti-Nestorian monks of Syria, and still more from their great influence with the emperor Theodosius II., whom they had induced from the Western party of Cyril. Theodoret was, as usual, slow to take up the controversy. He wrote to Dioscorus in the hope of effecting a reconciliation between the two parties. In this attempt he failed; and then, looking upon the dissenting party as the true part of the church, he wrote a book against them in the year 447, entitled 'The Beggar, or the Many-shaped' (ὁ ἐνοπλότατος, or μακρομορφός). By this title he meant to imply that the Eutychians were the largest of the heresies, and were generally named for the sake of brevity) was borrowed from a variety of antithetical heresies. The work consists of three dialogues: in the first of which, Eutyches, after a great success, reach the impiety of the divine essence underlying a change in the Son, διακομμένος, of the impiety of the two natures (the divine and human) being mingled into one; and in the third, ἡ ἐνοπλότητς, of the impiety of the divine nature against the human, the attempt to make the Son partake of the power, together with a moderation which drew upon Theodoret the reproaches of the zealots of his own party. His opponents, however, saw in his doctrines nothing less than a revival of Nestorianism; and Dioscorus accused him before Domnus, the patriarch of Antioch, of denying the one Lord Jesus Christ into two sons of God, and wrote also a severe letter to Theodoret, making the same charge. Theodoret replied with great mildness and moderation. He was accused of being too much of the disputed doctrine as he could conscientiously, and praying it was the peace of the church rather than for the views of a party. This letter only the more incensed Dioscorus, who permitted monks publicly to anathematize Theodoret in the church, while he himself the charge. He also sent ambassadors to Constantinople to accuse whole Eastern church of Nestorianism before the emperor. Domnus also sent deputies to clear his church of this charge, and Theodoret wrote with the same object to some of the same persons in the church, to make his defence. No immediate decision of the dispute took place, but the emperor ordered Theodoret, as a trouble of the church, to confine himself within the limits of his own diocese. He afterwards bitterly complained of being thus condemned unheard.

In the meantime the two parties grew more violent, and the imperial court itself became the scene of their disputes. In the year 448 Eutyches, in his zeal against Nestorianism.
Theodoric the Great, king of the Visigoths, was the elected successor, but was not the son of the king Wallia, who died a.d. 419. During the latter years of the reign of the emperor Theodosius II., Theodoric invaded Gaul, and in 423, just after the accession of Valentinian III., he invaded the city of Arles. Aëtius had relieved this town, and made peace with the Goths, who were obliged to come to terms because they were threatened by the Vandals, and they marched against the Vandals together with the Romans. After a peace of ten years, a new war arose between the Romans and Theodoric, who in 436 besieged the city of Narbonne, which was only relieved in the following year, 437. The issue of this war proved unfortunate for the Romans, the inhabitants of their provinces being reduced to despair by heavy taxes and other kinds of oppression, and the Goths being superior to the Romans in courage. Aëtius therefore enlisted several thousand Hunns, in order to employ them against the Goths; but these auxiliaries were not the inhabitants of the Huns, but mercenaries of the Huns, and were already under the command of the emperor. A body of the Romans, together with these Huns, commanded by Litorius, the best of the generals of Aëtius, having made some progress, laid siege to Toulouse in 438. Teodorico proposed to conclude a peace, but Litorius, remembering the fate of the Roman legions in the wars of Teutonic nations, refused all terms. Upon this the Goths made a sally; the Romans were entirely beaten, and Litorius himself was made a prisoner, and carried in triumph through the streets of Toulouse.

The whole country as far as the Rhône was now open to the Goths, and the inhabitants being well disposed, Theodoric made fresh conquests. The remainder of the Roman army was disorganized and in the greatest confusion. Nevertheless Aëtius, who was then Prefectus Praetorio in Gaul, found means to make peace, which was certainly favourable to the Goths, though the conditions are not well known. In 450 Gaul was invaded by Aëtius with his Huns and a numerous body of Teutonic auxiliaries. Aëtius pretended that his object was only to attack the Visigoths, but the Romans also took arms, and the united forces of Aëtius and Theodoric met the Huns at Châlons-sur-Marne (451). Theodoric commanded his army in person, and he was assisted by his two sons, Thorsimund and Theodoric. The battle was short, and the Huns were completely put to flight. After the battle, Teutonic troops, led by Aëtius, who fled on the following day, and thus escaped total destruction. King Theodoric was killed at the beginning of the battle. Prince Thorismund was probably killed at the same time. King Theodoric was laid on the field of battle with great pomp.

ATTILA. (Mason, History of the Ancient Germans, i, 11, 14, 27, 28.)

T HEODORIC, or more correctly THEODERIK, summoned the Great king of the Ostro-Goths, was the son of king Theodoric by his concubine Erliheva (Erlieva). He was born in 455, and he was seven years old when he was sent to Constantinople to the court of the emperor Leo Magnus (461). A hostages service having just been concluded between this emperor and Theodoric, who had engaged to assist the Romans for an annual payment of two thousand pounds of gold. Theodoric received his education at Constantinople, and returned to his father in 472.

Without any orders from his father, he attacked and subjugated some Slavonian tribes on the Danube, and, afterwards accompanied Theodoric in his expedition to Thessaly, which was undertaken for the purpose of obtaining a larger territory for the Inhabitants. All the operations having taken place at the same time as the death of Leo (January, 474); and Zeno Isauricus the elder, who became emperor in the month of February, hastily made peace with the Goths, and ceded to them the whole south part of Pannonia and the south-west part of Dacia (474). Thedemir died in 475, and Theodoric became king of the Ostro-Goths. Zeno having been deposed by another Theodoric, the
son of Triarius, a Gothic prince who had great influence in the Byzantine empire, king Theodoric marched to his assistance, and by his aid Zeno was again acknowledged as emperor (476-477). It seems that Zeno did not show himself so grateful as he ought, for serious differences broke out between him and the Goths. At length, the emperor, who was truculent, was loyal and generous, and he continued to be a faithful ally when the emperor had satisfied his just claims. He proved so serviceable, that Zeno created him Patricius and Magister Militum Præsidentis in 483, and subsequently put him to the command of the eastern war, which is still distinguished in the annals by his name. Jornandes affirms that Zeno adopted him as his son, and caused an equestrian statue to be erected in honour of him before the imperial palace. (De Relic. Goth., c. 207.)

He was also called 'the Good King Zeno,' and he lived to be one among the most illustrious of his race. His son, who was forced to renounce the Galla Placidia, who had been created queen of the West, was received with open arms by Zeno, and was one of his most faithful friends. (Procopius, i. 1.) Theodoric had certainly formed the plan of conquering Italy, and he was bent on carrying it into execution. If therefore he found it advisable to use some of the Ostro-Goths, it is not improbably so for the purpose of gaining those among the Romans who, although they detested foreigners, would submit to any conqueror whom they could consider as a delegate of the ancient legitimate authority.

Theodoric esteemed his union with the Ostro-Goths, that is, that part of the Ostro-Goths which obeyed the kings of the house of the Amali, of which Theodoric was a descendant. Some Gothic tribes only remained in Thrace and in the Tauric Chersonese. A whole nation, men, women, and children, carrying all their treasure with them, left their homes and took the road to Italy, following the Danube as far as the tract which lies between that river and the lake of Balaton in western Hungary. Traptalia, the king of the Gepidae, appeared with an army to prevent them from passing through his dominions; but he was routed by Theodoric on the river Ulea (the present Szala), which flows into the western corner of the lake of Balaton. Enduring hardships of all kinds, and fighting their way through the heathen inhabitants, they traversed the western part of Pannonia, crossed the Julian Alps, and reached Isorno, where they met with the army of Odosacer, who was beaten in three battles—on the Isorno, at Verona, and at Monza. Odosacer, who fled to Ravenna, was forsaken by his best general, Tullus and Frederic, a prince of the Ruggians, and Epiphanius, bishop of Pavia, also came to Milan to pay homage to the king of the Goths. Odosacer was blocked up in Ravenna by one part of the Goths, and Theodoric, with another part, took possession of the whole peninsula of Italy, leaving Sicily, Sardinia, and Corsica to the Vandals. The siege of Ravenna lasted three years; but at last Odosacer surrendered to Theodoric, who, notwithstanding his oath to spare the life of his prisoner, according to the agreement made between them, put him to death (493). Odosacer's son and his whole family shared the same fate.

Theodoric was now acknowledged as king of Italy by the emperor Anastasius, the successor of Zeno, who gave him the furniture of the palace at Ravenna, and a present of the Danube, which had sent to Constantinople. Theodoric did not assume the imperial title although he adopted the name of Flavius. In 500 he went to Rome and celebrated a triumph. The city was given to the soldiers as a prey, the palaces were made into barracks. Zeno sent an ambassador to the imperial council, and was confirmed the immunities of the Romans, and gained the affection of the lower classes by his liberality and by the exhibition of magnificent spectacles. Theodoric had already confirmed his power by all acknowledging him as king of the Burgundians, and by making an invasion into Italy and carried away many of the inhabitants.

Theodoric sent Epiphanius, bishop of Pavia, and Vitalis, bishop of Turin, as ambassadors to Burgundy. They succeeded in delivering the captives, and concluded an alliance between these kings and Theodoric, who gave a daughter Ostrogotha in marriage to Sigismund, the son of Gundobald. He likewise kept peace with the Vandals, and gave his sister Amalfrida, the widow of a Gotha, in marriage to his king Thrasamund. His eldest daughter, Theodelinda, was married to Alaric II., king of the Visi-Goths; and his niece, Amalabera, became wife of the Visigoth, Gundobald. He likewise kept peace with the Vandals, and gave his sister Aethilda, the widow of a Visigoth, to his king Thrasamund. His eldest daughter, Theodelinda, was married to Alaric II., king of the Visi-Goths. Alaric left the battle of Vouglé in 507, in consequence of which the greater part of the dominions of the Visigoths in Gaul came into the hands of the Frankish king. Alaric's only legitimate son, was held, as Arles, under guard by his sister, wife Theodihinda. As there was danger of all Spain being invaded by the Franks, the Visi-Goths intrusted the guardianship of their young king to Theodoric, who became the ruler over the Ostro-Goths and the Visi-Goths of Gaul, and was placed in the province of Illyricum, and parts of Raetia, Noricum, and Pannonia. Theodoric had previously sent an army to Gaul, commanded by Iba, who delivered Arles, which was besieged by the Franks (506); and the same general had previously captured the Cotchemer, the nearest rival of Visigoth, which was a dangerous rival of young Alaric. Clovis was expelled to content himself with the northern and eastern part of the Visigoth dominions in Gaul. From this year, 511, is dated the regency of Theodoric in the kingdom of the Visi-Goths, who led his troops to Spain, and the councils which were held during this government are dated according to the years of his reign. He took possession of the cities of Provence, perhaps under the pretext of the expenses which he had been put to in saving the Visigoth kingdom. He appointed his brother his lieutenant in Gaul, and Theodoric in Spain.

The relation between Theodoric and the empress of Constantinople was maintained to the satisfaction of both. Theodoric was the son of Arian, and the emperor of the Chersonese, who were not of the Catholic church (523), and soon after deprived the Arians of their churches. About the same time this emperor had engaged with some members of the Roman Senate in designs against the Gothic dominions in Italy. Boethius, then one of the most eminent scholars in Italy, and with being a principal conspirator. He was imprisoned in 522, and during his captivity he wrote his Treatise on the Consolation of Philosophy. The conspiracy proved abortive. Bothius was put to death, and his nephew, who was the father-in-law, shared the same fate in the following year. At Ravenna. With regard to religious affairs, Theodoric was an Arian, like all the Goths, ordered Pope John with several bishops to go to Constantinople and to entreat the emperor to make a settlement with his own Arians, for the pope reluctantly obeyed, but it seems that Constantinople he spoke rather according to his conscience than in favour of the Arians; for he was imprisoned at his return, by order of Theodoric, and died not many days after. The emperor, at the death of his father-in-law, took on the name of Gondobald and Godesisel, the kings of the Burgundians, and made an invasion into Italy and carried away many of the inhabitants.
The head of Symmachus, whom he had put to death, and whose participation in the conspiracy against Theodoric had not been proved; it is added that he was so terrified by his imagination, that he fell into a fever and shortly afterwards died. Others pretend that his death was the consequence of a divine judgment, because he had deposed and imprisoned Pope John: this story savours of its origin. Others dreamt that the ghosts of Pope John and several of his relatives visited Theodoric and found the burning crater of a volcano. The ashes of Theodoric were deposited in a porphyry urn, which still exists in the wall of the castle of Ravenna, and under it is an inscription on marble, bearing the date 563, which states that the urn was once consecrated by him. Theodoric, or Theodoricus, the son of his daughter Amalaswinth, succeeded him on the throne of Italy, and Amalaswinth became king of the Visi-Goths.

Theodoric generally kept his court at Ravenna, as the Roman emperors had done after the time of Honorius, and thus Ravenna became a centre of the arts and sciences, of no less importance than Rome. Among the high officers of Theodoric there were several very distinguished men, such as Evagrius, whose son was his private secretary, and Ennodius, who has written a eulogy of his master, which however is far from containing all the truth. He was celebrated as a hero in the old Teutonic songs, and in the "Nibelungen-Lied" he appears as Diederich of Bern, that is as the hero of the poem.

Theodoric was not only a conqueror; he was also a legislator. [Teutonic Nations, Goths.] It is his greatest glory that he was a friend of peace, of toleration, and of justice; a glory, however, which is somewhat obscured by some things he did to avert a danger, which was threatening to the empire. Between Teutonic kings, it was the custom to send an ambassador to the court of his neighbour, and he always reminded them that they were of one common origin, and that they ought to maintain peace and friendly intercourse. Theodoric was especially vigilant in preventing Cluvias from invading the states of his neighbours; he punished the authors and the remnant of the Alemanni, and he saved the kingdom of the Visi-Goths from destruction.

(Ennodius, Panegyricus Regis Theodoricii, ed. Chr. Celarius, 1709, 8vo.; and also in his Opera, ed. Jac. Scirmonde, 1773, 8vo.; Eutrop. hist. iv. 34; Isidorus, Chronicon Gothorum, &c.; Procopius, De Bellis Gothico; Coelio-Caenienus, Vita Theodoricii Reg. Ostrogoth., ed. Peringskjold, Stockholm, 1859, 4to.; Coelio-Caenienus has written a work on the Gothic system, which has shown no historical ability in his additions, which however contain very interesting matter relative to the language and the antiquities of the Goths. Mano's Geschichte des Ost-Gothischen Reiches in Italien, Breslau, 1824, 8vo., is a very valuable work.)

THEODORIC, a bishop and celebrated surgeon of the thirteenth century, was a pupil of Hugo of Lucca. He at first belonged to the order of the Preaching Friars (Frères Prêcheurs); afterwards he became chaplain to the Bishop of Valentia, and penitentiary to Pope Innocent IV.; and he was at last made bishop of Bitonti and Cerva succession. Towards the end of his life he settled at Bozigna, where he died in 1238. He was especially distinguished for his skill in surgery, and was ready to give his services without making a charge for them; and for this reason he appears to have carefully studied the cases that presented themselves to his notice, and to have recorded in a great measure the results of his own observations. He also introduced several useful innovations in the practice of surgery, and was the first person who ventured to lay aside the cumbersome and frightful machines which had hitherto been used in the reduction of fractures and luxations. He left behind him a surgical work, entitled 'De pententia secundum libram Lutetenses;' which was published at Venice in 1490 and 1510, in folio. (HaIler's Biblioth. Chirurg.; Sprengel's Hist. de la Méd.; Biographie Médicale.)

Diodorus Cyprianus, a native of Cyrene, was a philosopher of the Cyrenian school, who lived towards the end of the fourth century A.C. He was a pupil of Arete, the daughter of Aristippus, and afterwards became the successor of Anaxicrates. His philosophical system, which was a kind of medium between that of Aristotle and Anaxicrates, appeared so dangerous to his fellow-citizens, among whom he had been held in very high esteem, that they banished him from their city. Theodorus went to Athens, where he would have experienced a greater degree of freedom. Demetrius Phalerus had not interposed and saved him; for here too his doctrines soon came into disrepute, and a public accusation was brought against him of moral and religious impiety. After his flight to Athens, Demetrius Phalerus, Theodorus thought it advisable to withdraw from Athens, and he went to Egypt, where he soon gained the confidence of Ptolemaeus Soter, who, on one occasion, sent him as his ambassador to Lycaenius. On the other hand, he was desired by the Antiochian bishops to go to Antioch, and a strong feeling of independence towards Lycaenius, who taunted him for having been obliged to leave Athens. The time of his death is unknown.

We do not possess a complete view of the philosophical system of Theodorus, but he appears to have had one of the forerunners of Epieurus. His ideas of the deity were explained in a book which he wrote on the gods (τας θεον), and which earned him the name of atheist, though it is doubtful whether this epithetous name was given him because he really denied the existence of gods, or merely because he was above the common prejudices of his countrymen. The following doctrines are especially mentioned as characterising his views of human affairs:—wisdom, virtue and justice are incapable, because of the enjoyment of pleasure; friendship, on the other hand, has no real existence; for, in a person who is not wise, it ceases as soon as he ceases to feel the want of it, and a wise man is in want of nothing beyond himself. Patriotism is a trust, because it would annually renew a sense of the inferiority of his country. He meant, however, to elevate upon a wise man to sacrifice himself for the ignorant, who form by far the majority of a state. His followers, who constituted one of the three branches into which the doctrines were divided, were more correctly called Diodorians.

(Diogenes Laert., ii. 86; vi. 97; Cicero, Tusculan., i. 43; v. 40; De Natura Deorum, i. 1, 23, 43; Suidas, s. v. ωετος.)

From the philosopher Theodorus of Cyrene we must distinguish Theodorus the mathematician, who was a native of the same place, and is mentioned among the teachers of Plato, (Xenophon, Memorab., iv. 2, 10; Maximus Tyrius, Dissertat., 22.)

THEODORUS PRISCIANUS, the author of a Latin medical work, which is still extant, and which sometimes goes under the name of Octavius Horatianus. He was a pupil of Vindicianus, and is supposed to have lived at the court of the emperors of Constantinople in the fourth century, and to have been a pupil of Theodorus, but he appears to have also mixed up some opinions of the Methodici, and even of the Dogmatici. His work, which is not of much value, is entitled 'Rerum Medicae Libri Quatuor;' and is written in a barbarous Latin style. The first book treats of external disorders, the second of internal, the third of female diseases, and the fourth of physiology, &c. It was first published in 1332, fol., at Strassburg, and also in the same year at Basle, 4to.; of these two editions, the former is the more complete, the latter the more correctly printed. A new edition was undertaken by J. M. Bernhold, of which the first volume was published in 8vo., without place or date, at Anabach in 1791; but which, in consequence of the editors' carelessness, it is very likely that a part of the genuine work was printed together with 'Dietae, seu de Salutaribus Rebux Liber,' which has been attributed to Theodorus Priscianus, but (as Choulant thinks) incorrectly. It was first published together with 'Hildegardis Physica,' Argentor., 1536, 8vo. It first appeared entitled 'Diaeta, seu de Salutaribus Rebux Liber;' this has been attributed to Theodorus Priscianus, but (as Choulant thinks) incorrectly. It was first published together with 'Hildegardis Physica,' Argentor., 1536, 8vo.
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preached in the fields round the town, and he was always surrounded by a numerous congregation of Catholics. He also defended the orthodox faith with great inflexibility against the attacks of the Arians and the tyranny of Valens. Immediately after the death of Valens, he was appointed bishop of Tarasus (378), Gratianus, the successor of Valens, being a zealous Catholic. In 381 Theodorus was at the Council of Constantinople. The year of his death is not known, but as Phalerius was chosen bishop of Thessalonica in this year. Theodorus was much esteemed by his contemporaries for his plain and lucid eloquence, but though he was known as the most zealous defender of the Catholic faith, he was accused of having shown his piety to be too favorably disposed to Nestorius. The same charge was made against his contemporary Theodorus of Mopsuestia.

Theodorus of Tarasus wrote numerous works on theology and morals, none of which have come down to us. It is said however that one of his works on Politics, which Fabriacus believes to be identical with another work on providence, exists in a Syriac translation.


The native of Syria, the great-grandson and son of Theodorus, patriarch of Jerusalem, was elected bishop of Rome after the death of John IV, A.D. 641. Constans II. was then emperor of Constantinople, and Rotari was king of the Lombards in Italy. The patriarch had a church built on the Capitol, and it was supported by the emperor Constans, and by Paulus, patriarch of Constantinople. Theodorus held a council at Rome in 648, in which Paulus was excommunicated. It does not seem probable that theodorus concurred, as some assert, the typus or edict of the emperor Constans, in which he forbade all his clergy from disputing on the subject of the two wills in Christ, the Monothelites asserting that there was only one will in him. [Ecclesiast.]

Theodorus built several churches in Rome. He died in 649, and was succeeded by Martin I. (Muratori, Annali d'Italia; Panvino, Vite dei Pontefici.)

THEODORUS II., a native of Rome, was elected pope after the death of Romanus, in August, 897, and died three weeks after his election, and was succeeded by John IX.

THEODORUS LASCARIS, emperor of Nicaea, was descended from an antique and noble Byzantine family, the early history of which is unknown. In 1196 he married Anna Angela-Comnena, the widow of Isaac Comnenus Sebottendor, and the second daughter of the emperor Alexius III., Angelus-Comnens, who usurped the throne of Constantinople, after having blinded and thrown into prison the emperor Isaac Andronicus, the son of Isaac, fled to Italy and implored the protection of the Western princes, who, in 1203, were assembled at Venice for the purpose of a new crusade. They promised him assistance, and sailed to Constantinople with a powerful fleet, commanded by Dandolo, the doge of Venice. They laid siege to Constantinople, but while the emperor Lascaris prepared a vigorous resistance, Alexius III., who was of a man and cowardly character, secretly left his capital and fled to Conrad, marquis of Monteferrat, in Italy, who had married his sister Theodore. Assaulted by bold and experienced troops, and abandoned by his emperor, the Greeks were struck with alarm: they surrendered their capital, and did homage to the blind Isaac and his son Andronicus, both of July and August, 1204, who rejoined together under the protection of the Latin princes. However, Alexius Ducas Muzulphus had made a party among the Greeks, who were enraged at the haughtiness of their former protectors. He murdered Alexius IV., Isolde, and one of the empresses, and proclaimed Alexius Ducas emperor under the name of Alexius V. (28th of January and 8th of February, 1204). The Latins immediately laid siege to Constantinople, to avenge the murder of their ally and friend, and to forestall the new emperor. Assisted by emperors Lascaris, defended the capital with skill and energy, the fall of this city became imminent. Suddenly Alexius V., fled with his treasures (April, 1204), and the consternation which had reigned after the flight of Alexius III. once more produced meddlesome disputes among the Greeks. During a period of six months, four, and as Isaac reigned twice, five emperors successively occupied the throne; and such was the passion for ruling among the Greek nobles, that in this critical moment, when the very existence of the empire was at stake, two candidates presented themselves to the people for the purpose of obtaining the crown.

These candidates were Theodoric Lascaris and Theodore Ducas, who was of Imperial descent. Lascaris was proclaimed emperor, but fearing some sudden opposition from the adherents of the fugitive emperors, he declined the empire, and as such, it was conferred upon his brother, the Prince of Despot, until he had re-established tranquillity. However, while he endeavored to secure the people to the besiegers, the Latins made an assault and succeeded in taking the town, the Greeks having cowardly abandoned their resistance. The Greeks, having fled, and after a few days, Theodore Lascaris escaped with his wife Anna, and fled to the opposite shore of Asia. The Latins chose Baldwin, count of Flanders, emperor of Constantinople, and gave him the capital and one-fourth of the empire; the remaining three-fourths were divided between Venice and the Frankish barons.

Meanwhile Theodoric succeeded in raising troops in Asia, and, assisted by the Turks of Koniah, or Iconium, he made himself master of the imperial throne, and became the great-grandson of Bithynia, proclaiming that he acted only as despot, and in the name of his father-in-law, the fugitive emperor Alexius III. (Autumn, 1204). His conquests were soon taken from him by Louis, count of Blia, and his wife, Eunice, who, in the person of his son and who defeated Theodoric at Paesmaen, on the frontier of Asia and Bithynia (8th of December, 1204). Theodoric retired to Brusa, one of the few towns which had not fallen into the hands of the count of Blia; but he was defeated and obliged to flee with Henry, count of Flanders, the brother of the emperor Baldwin, who defeated him.

Theodoric would have been ruined but for the victories of the king of the Bulgarians and the revolted Greeks in the trodden land of the empire, and the fall of their last hope, in the person of Eunice, and who became the last and only consternation of the count of Blia and the Latin troops in Bithynia. Theodoric again became master of this country, and his father-in-law, Alexius III. being then kept a prisoner by his marquis of Monteferrat, he assumed the title of emperor. He styled himself Amphote, and Abrodrupop Poyaloe, which was the title of the emperors of Constantinople, and he thus showed that he considered himself as the only legitimate emperor of the East, having a right to the crown by his wife Anna, a daughter of Alexius III., who was prevented from ruling on account of his captivity, and all the other emperors of Greece excepting being then dead. In order to solemnize his accession to the imperial throne, Alexius convoked a general assembly of the Greek bishops in the island of Eginium, in the presence of Michael Auriornies, presided over by the archbishop Michael Auriornies, presided over by the archbishop of Constantinople, and who became a great patriarch for the special purpose of crowning Theodoric. The patriarch Didymothius having resigned.

Meanwhile several Greek nobles, profiting by the deep hatred of the Greeks against the Latin conquerors, but once masters in independent Asia. Theodore, called Merothoedorus, reigned at Philadelphia, and Manuel Monrozmus, supported by Ghiyshet-ed-din, sultan of Kunn, became powerful in Phrygia; but they were both defeated by the emperor of Nicaea, as Theodore Lascaris is generally called. A third and more dangerous adversary was Alexius Comnenus, who had reigned as emperor at Trebizon from the year 1204, and whose brother David overran Asia Minor in 1209. During the same year, August, 1209, David and David were equal in military skill, in activity, and in perseverance: neither of them was discouraged by defeat, but made less vigilant by sudden success. After their first encounter, David, appreciating the character of the enemy and hisarchs, especially those of the Greeks, decided to seek each of them, and in the year 1214, the emperor Constantine, who had succeeded his brother Baldwin. Theodore however defeated them both, and some time afterwards David was again completely defeated by Theodore Lascaris, the last emperor of Nicaea. After the truce between Theodore and Henry in 1210, David, who had hitherto carried on the war against the Latins with various results, was compelled to give up all hopes of keeping the field any longer. He lost all his conquests, and was forced to retire to the Gallican, his residence in Asia Minor (1214), who thus became master of the greater part of Paphlagonia. The truce between Theodore and Henry was the end
The sequence of various victories obtained by Theodore over the troops of Henry. In 1207 the emperor of Nicaea was besieged by the Franks in Nicomedia, but in a sally he made prisoner Count Thierry de Los, or more correctly Diedrik van Looz, a powerful baron from the Low Countries. The capture of the first duke of Lower Lorraine. Henry ransomned himself for a fine, but then had to pay a subsidy to the several fortified towns to the emperor of Nicaea, and arrangements were made which led to the truce of 1210. In this year the old emperor Alexis III., who had escaped from the Franks, published to Asia, to the court of Sultan Ghaïûth-ed-dîn, and persuaded him to support his claims to the throne of Nicaea, or of any other part of the Eastern empire. The Sultan summoned Theodore to restore his father-in-law to the throne, and left Koniah at the head of 20,000 men. He was attacked in the neighbourhood of Antioch by Theodore, who had only 2000 men, but who charged the Turks with such impecuniosity that their lines were broken, and they were entirely defeated. Ghaïûth-ed-dîn himself was killed by Theodore, and old Alexis was made a prisoner (1210). He was confined to a monastery at Nicaea, where he died some years afterwards. Although Theodore had acted in his father-in-law's name while he was only despot, he had succeeded his throne in his own name and at his own risk. Theodore's wife, Anna, the daughter of Alexis, was then dead.

It is said that in 1214 Theodore fell into the hands of Az-ed-dîn Key-kaus, the successor of Ghaïûth-ed-dîn; but the fact has been discredited by the Turks. It has been shown that it was Alexis of Trebizond who was made prisoner by the sultan. Except one short campaign against Henry in 1215, which was followed by a truce in 1214, Theodore reigned the last ten years of his life in peace, before his death. After the death of Anna he married Philippa, an Armenian princess, whom he repudiated after she had borne him a son; and in 1220 (I) he chose for his third wife Maria, the daughter of Peter of Courtenai (Kortyk), emperor of Constantinople, who was the last of the Paleologi and successor of Peter. Theodore wished to give his daughter Eudokia in marriage to Robert, who was of a very mild and amiable character, but this marriage was strongly opposed by the Greek patriarch Manuel, because the two emperors were brothers-in-law, and it was not carried into effect.

Theodore died in 1222, being between forty-five and fifty years old, in the same year with Alexis I. of Trebizond. Although the event of his death is not so well known as his life, the law John Vatatzes. One of Theodore's daughters, Maria, was married to Andreas, king of Hungary.

(Nicetas, Alex. Comm., and Baldusius; Acropolites, especially c. vi.; Historia Franco-Byzant., lib. iii.; Gibbon, Decline and Fall of the Roman Empire, vol. ii. p. 517; William of Fellenzayer, Geschichte des Kaisersrathen Trojan.)

THEODORUS, Sculptor. [SCULPTURE.]

THEODORUS of Bithynia or of Tripolis in Lydia, for it appears that both these descriptions are applied to him (though there is another Theodoreus of Tripolis, the author of an obscure poem), was a mathematician, of whom there is some question whether he lived about fifty years before Christ, or some centuries after. Strabo and Vitruvius both mention a Theodoreus: the latter ranks of him as the inventor of a dial for every climate (or latitude): if this be the subject of our article, he must have lived after Christ.

But on the other hand, Ptolemy does not mention him (though this tells little either way); and Suidas, enumerating his administration, refers us to Proclus to mention, adds that he was also a commentator on some parts of Theudas: if this be the case, he must have lived after Christ. The balance of authorities seems to be in favour of the former supposition: if the writings only were considered, it would doubt that they were composed before the time of Ptolemy.

We have left of Theodoreus—1. Θεοδώρα. Spheres, in three books; 2. περί νυκτός και ήμερας, in two books; 3. περί εἰκοσιαυτά. The first is a proof of the correctness of the modern spherical geometry; the second and third simply describe astronomical phenomena as they appear in different parts of the world. It is hardly a matter of certainty that the three works have the same author: the second and third add nothing to the fame of the author of the first.

The Spheres were translated by the Arabs, and from their version a Latin one (of little worth) was published at Venice in 1518, but whether it was published is not stated (Heilbronn). Another Latin version, probably also from the Arabic, was published by Vogelius at Vienna, 1529, with scholia. John Pena gave the first Greek text, with Latin, Paris, 1573. The work was translated into several other languages: by Blumius in Italian, 1567. But the best edition is the Oxford one, Greek and Latin, 8vo., 1707. The other works were published by Dusapodium, in Latin, Strassburg, 1572, 8vo. Joseph Justus Scaliger published his knowledge in a Latin edition in 1657. But this Latin edition has been republished at Paris in 1836, and compared with the original by Theodoreus. But Heilbronn does not mention this last. (Weidler; Heilbronn; Delambre.)

THEODOSIUS I., FLAVIUS, surnamed the Great, was the son of the general Theodosius who had signified himself great; &c. the reign of Valens and Valentinian in Britain and Africa, but was put to death in A.D. 376 at Carthage through the envy of the courtiers. The Theodosi were an illustrious family of Spain, of the town of Italica, near the modern Seville. The great Theodosius was born in A.D. 345, and was educated by the ablest men of the time, while his father, himself one of the greatest generals, instructed his son in the art of war, and accustomed him to the strictest and severest discipline. He took him with him in his campaigns, and he was present in many, and Africa, and made him acquainted with all kinds of warfare, so that the boy became early accustomed to the endurance of hardship. The various occasions on which he was not overruled, and he was raised to the rank of duke of Moesia, with an immense army command. Here again he distinguished himself above all the other military commanders. He vanquished the Saracens, and it was only owing to his intrepid character that the province was not lost altogether. (Ammianus, &c., xxxix. 6; Zosimus, iv. p. 219, &c.) After the death of his father, in A.D. 376, he obtained permission to withdraw from public affairs, and retired to Caesarea in Spain, where he devoted himself to agricultural occupations on his extensive estates, and administered the affairs of the state who came in contact with him, for he possessed no less the virtues of social and domestic life than the talents of a general. But he did not remain long in the enjoyment of his quiet happiness; his virtues and talents had made too deep an impression to be forgotten in the court; and on the 16th of January, 379, the emperor Gratian raised Theodosius at Sirmium to the dignity of Augustus, with the command over Illyricum and all the eastern provinces. Theodosius conducted the war against the Goths with great success. Theodosius was raised to the rank of emperor. Theodosius was raised to the rank of emperor. Theodosius was raised to the rank of emperor.

As regards his Gothic enemies, Theodosius was indebted as much to his good fortune as to his military talents; for
after the death of Fritigern dimensions and hostilities broke out among the Gothic tribes themselves, and he succeeded even in engaging some of their chiefs in the service of the empire. The greater part however of the subjects of Fritigern, tired of their state of anarchy, made Athanareian their king, who concluded a treaty with Theodosius at Constantinople (A.D. 381). Athanareian indeed did not long survive the conclusion of this peace, for an expedition was projected against them. But the army they had received from Theodosius, willingly submitted to him, and numbers of them enlisted under the Roman standard. The treaty of the king and the submission of Athanareian was followed by the defection of the Visigothic chiefs, who promised to become the faithful allies of the Romans. Lands were then assigned to the Visigoths in Thrace and Lower Moesia (A.D. 382). The Ostro-Goths on the banks of the Danube were conquered several years later (A.D. 386), and received settlements in Phrygia and Lydia. The conditions on which the Goths became subjects of the Roman Empire are imperfectly known: thus much only is certain, that they acknowledged the sovereignty of Rome without submitting to her laws or the jurisdiction of her magistrates; their chiefs also still continued to have the command of their respective tribes in peace and war, and an army of 4000 Goths was maintained for the perpetuation of this privilege, although they felt obliged, for the safety of his dominions, to make several concessions, yet succeeded in persuading the Goths that all were the voluntary acts of his own sincere friendship towards them. The conduct of the emperor, certainly the wisest of all the Goths, was followed by an episcopal care, which was abolished in 382. The conditions of peace were ratified by an edict issued on the feast of Christmas (A.D. 385). Theodosius, however, did not abandon his policy of removing the Goths to the west, and gave them compensation in money for the losses that they had sustained. In the year 390 he entered Rome in triumph, together with his son Honorius and Valentine.

During the period of his stay in Italy an insurrection broke out at Antioch, in which the people demanded redress of several grievances, especially a diminution of their heavy taxes. When these demands were haughtily refused by the imperial officers, the populace destroyed the statues of Theodosius, his wife Flacilla, and of his sons Arcadius and Honorius. The insurrection however was soon put down, and when Theodosius was informed of the occurrences, he sent Hellebisicus and Caesarius to inflict punishment. Many of the insurgents, however, by sending messengers came soliciting a milder treatment, and assured the emperor that the people sincerely repented of their crime, he generously granted them a general pardon. But this generous act was followed by another which was fatal to the empire. The insurrection had been suppressed by the that the emperor, on Christmas day, in attendance at the service in the great church of Milan, his wife Flacilla, and his brother-in-law Hesiodus, was at first uncertain whether he should take vengeance upon the city or exercise clemency as he had done towards Antioch. Rufinus induced him to do the former, and consul Flacillus he accordingly sent to punish the crime. Theodosius on his way to Italy, where the insurrection had most probably been instigated by the archbishop of Milan, was informed of the cruel massacre, and seized with indignation and grief; and eight months later, when the emperor, on Christmas day, wished to attend the service in the great church of Milan, he was repulsed by the crowds and had to retire to his villa in Brixia. The emperor was thus divided among three enemies. But Maximus had no intention to keep the peace, and his ambition stimulated him to make himself master of Italy also. In A.D. 387 he broke in upon Italy, and took Milan, the residence of Valentine, by surprise. The young emperor, his mother Justinia, and his sister Galla, fled to Thessalonica, to imitate the protection of Theodosius. The emperor of the East received the fugitives kindly, and as his elder wife Flacilla had died, he married Valentine to his eldest daughter Galla, and looked upon himself as the guardian of the young emperor. The opportunity of chastising the faithless Maximus was very welcome to him, and preparations for war were made throughout the whole extent of his dominions. In order to secure his empire on its south-eastern frontier, a treaty was concluded with Persia. A large fleet assembled in the ports of Epirus and Greece, and Theodosius placed himself at the head of a well-disciplined army, with which he moved forward to meet the enemy, where he pitched his camp in the neighbourhood of Siscia, on the Danube. A battle was fought, in which the Huns, Alanis, and Gothic, who served in the army of Theodosius, greatly distinguished themselves. Maximus was defeated and put to flight, and his empire was partitioned among his nearest relatives, all of whom were enemies of each other. His enemy either alive or dead, pursued him as far as Aquileia, in which town Maximus shut himself up. The usurper, who had no hold on the affections of the people, was dragged forth from his palace into the hands of the conqueror, who gave him up as a victim to the rage of the soldiers. Victor, the son of Maximus, was killed in Gaul by the hand of, or at the command of, Arbogastes, the Franks, who made himself master of Gaul (A.D. 392).
the elevation of Eugenius. But he was at that moment not prepared for a civil war, and the ambassadors of Eugenius were consequently received with apparent favour and dismissed in a friendly manner. Preparations for war however, which lasted for almost two years, were immediately commenced, and Stilicho and Theodosius were charged with recruiting and disciplining the forces. In the spring of the year 394 Theodosius set out from Constantinople against Eugenius. The armies met at Pannonia, and, after a lengthy contest, Eugenius retreated and crossed the Danube. Theodosius followed, and was joined by his son-in-law Arbogastes, whom he had appointed governor of the banks of the Cold river, near Aquileia. Eugenius put to death, and Arbogastes in despair put an end to his own life. Theodosius was now sole emperor of the Roman world, and was cheerfully acknowledged by all the Eastern provinces, and by the Senate, while the churches hailed him as a saviour and delivered him from the heresy of the Origenists. The empire might now look forward to a period of peace and happiness under the administration of Theodosius. But he was suffering from dropsy, and his health was rapidly declining. He died on the 17th of January, 395, at Milan, whence his body was conveyed to Constantinople, and buried there. His two sons Arcadius and Honorius had been raised to the rank of Augustus, and the father had shortly before his death given them the provinces of the East and West. Ar- cade was to occupy the throne of the East. The Roman empire henceforth remained divided into the Western and the Eastern empire. [ROME, p. 110.]

Theodosius II., or the Younger, was the son of Arcadius, and grandson of Theodosius the Great. He was born on the 18th of April, 401. His father died in 408 at the age of thirty, and was succeeded by his son, who was ten years old, at the head of the Eastern empire. There is a statement that Arcadius in his will made Jezedegor, king of Persia, the guardian of his son and regent of the empire during his minority. (Jornandes, De Bel. Pers., i.) That Arcadius deserved such a mark of respect, and it is a fact that Anthemius, the prefector pretorio, from the very first assumed the government of the Eastern empire in the name of the young prince, and carried it on in a praiseworthy manner down to the year 414, when he voluntarily resigned it to Pulcheria, the sister of Theodosius, who was only two years older than her brother, and had shortly before received the title of Auguste. This woman continued to exercise the sovereignty in the name of her brother, and even after his death, which occurred in 421, and down to his death, but even three years later, until she herself died. During the early part of Theodosius's life Pulcheria herself conducted and superintended his education; but the prince seemed to possess no ambition, and his education was neglected. This infatuation of the whole life in a perpetual infancy, surrounded by women and eunuchs, and he idled away his time in hunting, painting, carving, and making elegant transcripts of sacred toils. A new constitution was carried on in his name; but whether its acts deserve praise or blame, he can have no share in either, as he blindly acquiesced in all that his sister did. She also persuaded him, in A.D. 421, to marry Eudocia (before her baptism her name was Theodora), the daughter of Paulus Diaconus, an Athenian sophist. This woman, who was no less distinguished for her beauty than for intellectual powers, soon gave birth to a daughter, Eudoxia, after which she was raised to the rank of Augusta. She lived with her husband till the year 444, when, being accused of零售 of the line of her husband and proper conduct, she was obliged to quit the court, and withdrew to Jerusalem.

In 421 a war broke out with Varanes, king of Persia, whom the able Edictum Theodosianum, a general of Theodosius, and a peace was concluded for a hundred years, which lasted at least for thirty. With this exception, the long reign of Theodosius was one of almost undisturbed peace. It was only during the last years of his life, A.D. 401 to 408, that Pulcheria and Eudoxia, under the influence of Amphilochius, called Attila and his Huns. [ATTLA.] The Asiatic provinces, by far the most extensive, continued to enjoy a profound and permanent repose. Theodosius died on the 28th of July, 450.

The reign of Theodosius II. is memorable in the history of jurisprudence through the collection of laws that was made in it, and bears the name of Codex Theodosianus. [THEODOSIIUS III.], surnamed Agramyneus, emperor of Constantineople. He succeeded Anastasius II. in the year A.D. 715, being elevated to the imperial throne by his father of his predecessor, named Aramynitius. He was a man of obscure birth, and accepted the throne with reluctance. He is praised for his unblemished conduct, and for the protection which he afforded to the Church. He had not enjoyed his elevation more than one year, when Leo III., a man of superior abilities, was proclaimed emperor. Theodosius willingly withdrew, and spent the remainder of his life, together with his son, in a monastery.

THEODOSIAN CODE. In the year A.D. 429 Theodosius II. appointed a commission of eight persons, at the head of whom was Antiochus, to form a code out of all the constitutions and other laws which had been promulgated since the time of Constantine the Great. The code was to be formed on the model of the private compilations respectively called the Codex Gregorianus and the Codex Hermogenianus. Either nothing was to be omitted, or, for some reason, all that was thought necessary, and this renewed commission received its instructions in the year A.D. 435. This second commission consisted of sixteen members, with the same Antiochus at its head. In respect of their manner of working, it was empowered to omit the superfluous, insert the necessary, change the ambiguous, and reconcile the incongruous.

The code was completed and promulgated as law in the Eastern empire in the year A.D. 438, and it was declared by Theodosius to his son-in-law Valentinian III., who confirmed it and laid it before the Roman senate, by whom it was received. In the year 448 Theodosius forwarded to Valentinian other constitutions which he had made since the completion of the code, as circumstances had arisen; and this commission of the year 435 continued to be in operation in the Eastern empire in the same year. The new constitutions were called Novellae, and all such new constitutions which were interchanged between the East and West, and had reference to the code of Theodosius, were called Theodosian.

The code of Theodosius was the last constitution of the kind that we know is one of Anthemius, who was contemporary with Leo I. in the Eastern empire; it belongs to the year 448, and relates to the year 455. This code consists of sixteen books, which are divided into titles, and the titles are subdivided into sections. The arrangement of the matter differs from that in the subsequent compilation of Justinian, also called the Code. The code of Theodosius treats of Jus Privatum in the first part, and especially in the second and fourth books, both included, and in the beginning of the fifth: the following books treat chiefly of Jus Publicum. The first book treats of offices, and the sixth fifth book of the second section of Alaric II., commonly called the Breviarium, in an abridged form, accompanied by a continual interpretation or explanation; and it was used in the compilation of the Lex Romana of the Burgundians, which is often incorrectly called the Lex Elena. The greater part of the Theodosian code and of the Novellae Constitutiones exist in their genuine state: the first five books of the code and the beginning of the sixth are chiefly found only in the Breviarium edition of J. G. Renaudot (8 vols. fol., Lyon, 1665, re-edited by J. D. Ritter, fol., Leipzig, 1793-1749), and also the edition of the Rruus Civilis Ante Justinianae, Berlin, 1815.
THEOPHANY, or THEODOXUS, Montfort's name for a divinity of the genus Nerita, type Theodoxus Luteolusianus; Syn., Nerita fluviatilis, Felix de Roissy.

THEGNIS (Oléron), an elegiac poet of Megara, the capital of the small state of Megarides, was living at the close of the sixth century B.C.; and it appears from his own writings that he lived to the date of the battle of Salamis, B.C. 480. In one of those revolutions which frequently occurred in the small Grecian states, the democratic body at Megara overpowered the aristocratic, to which Theognis belonged. Theognis, who was then absent from his home, lost his landed property in this revolution, which, with the rest of the Megaridan territory, was partitioned among the successful party. It appears that he lived in exile at Thebes. The fragments of Theognis abound in allusions to the revolution by which he had suffered, and he expresses in bitter language his complaints against that base class which had usurped the station and property of the body to which he belonged. He had also the mortification of seeing a rich rival of mean birth prefered to himself in the posts of a public benefactor. Yet he was in some measure indemnified for his loss by retaining the affection of the girl after she had married his ignoble rival.

It appears from his verses that he had been in Sicily, Euboea, and Sparta; and it was in Sicily that he wrote one of his elegies which was addressed to the Sicilian Megarians, who were a colony from his native state. There seems no reason to doubt that his elegies were composed on various occasions and on particular subjects, and that so far they resembled the elegies of Tyrtæus, Archilochus, and Solon. But as these elegies contained numerous general maxims or lessons for conduct, it is conjectured that in the course of time nearly everything was omitted from them which had a merely private application, and thus the elegies of Theognis were formed into that general collection of gnomic such as we now have it, consisting of above fourteen hundred hexameter and pentameter verses. It is observed that nearly all the passages in this collection which are not addressed to a person named Cyrus, the son of Polypas. Cyrus appears to be a youth of noble family for whom Theognis has a tender regard, and whom he exhorts to the pursuit of wisdom, to prudence in conduct, and to the enjoyment of life.

The verses of Theognis contain many allusions to the symposia, or entertainments, of the Greeks, in which it was usual, after the libation had been duly performed, for some of the company to recite a poem, especially the elegy addressed by the poet to himself. This poem, or elegy, was addressed either to all the company, or, as appears to have been always the case with the elegies of Theognis, it was addressed to a single person.

The fragments of Theognis have been often printed.

They were first printed in the Collection of Gnomic poets by Aldus, Venice, 1499; and they are contained in Gaisford's Poetae Minores Graeci, Oxford, 1841-2. One of the latest and best editions is by F. E. Weicker, Frankfurt-on-the-Main, 1826. They were translated into German verse, with short notes, by C. Thudichum (1829); and also by W. E. Weber (1834).


THEOLOGY (Theokosia, the science which relates to God), in order to guard against any misconception of the object of this article, it seems advisable to state in the outset that it is designed to treat of the subject of theology purely in a scientific and historical point of view. Any discussion of the doctrines of Christian theology, or any attempt to frame a system of Christian theology, would be inconsistent with the plan of this work.

I. DEFINITION OF TERMS.

All that men know of the nature of God, considered absolutely, of the relations between God on the one hand, and themselves and other beings on the other, together with the consequences resulting from those relations, and the duties arising out of those relations—all this knowledge is contained in the word theology. Knowledge to a systematic form, is the province of the science of theology; and the truths of religion, when arranged in a scientific form, constitute a system of theology. Theology stands to religion in the same relation as the Greek dialect to the Greek language. It stands to philosophy in the same manner as the latter science stands to the mind, philosophy to language. By many writers the words theology and religion are used as synonymous terms; but such a usage of them is incorrect. [Compare Religion.]

The above definition applies to the word as it has been understood for some centuries; but its earlier use was somewhat different from this. The Theokosia of the Stoics was as much the philosophy of divine existences, and it included all questions relating to the origin, the nature, and the service of the gods. As relating to the origin and mode of existence of the gods, Aristotle uses the verb Theokosia (Metaphysics, i. 3; and Cicero the noun theologiae [De Nat. Deor., iii. 21]. In wider signification the word is used by Varro, Autocinia, De Civitatis. Dei, v. 5; compare Eusebius, Praeaeunt. Evang., iv. 130, who distinguishes three different kinds of theology: (1) poësis, or fabulorum, mythical or legendary; (2) theologia, from which he constructs theology (3) theològ, or cœtis (political or popular). Of these the first is the theology of poets, the second of philosophers, the third of the people; or, as Varro expresses it, 'The first is chiefly adapted to the theatre, the second to the universe (ad mundum, the third to the city.

In the New Testament the word is not used. The role of the Apocalypse, in which the word theologia is applied to the author, is much later than the book itself. [Apocalypse.]

The simpler terms knowledge (gnosis), faith (vnotia) are those which approach most nearly to the meaning of the word theology, but the fact being that theology, as a system, is not taught in the New Testament, there is nothing surprising in the absence of the word.

In the early Christian church the word was sometimes used in the general etymological sense of the science which relates to God and divine things; but we also find it employed to denote the divinity of the Godhead. In the controversies respecting the nature of Christ, the orthodox party adopted as a kind of motto the doctrine of the Evangelist, Toda 6 & ili (the Word was God, i. 1), and the meaning which they attached to that sentence was transferred to theology, which, therefore, in this use of it, may be defined as the doctrine concerning the divinity of the Word. [Logos.] It is in this sense that the epithet Theokosia is applied to the author, and to the modern usage of the word, as expressed in
the above definition, was first adopted by Peter Abaïard (ob. 1142), who drew up a system of scholastic divinity, to which he gave the title of 'Theologia Christiana.'

It should be remarked that instead of the Greek word theology, the Latin word divinity is often used to describe the science of religion.

II. FOUNDATIONS OF THE SCIENCE.

Like every other science, theology consists in the application of the human understanding to the study of things in a spiritual sense. These truths are, as is plain from the definition, the truths of religion. If therefore the existence of God, of attributes belonging to him, and of relations subsisting between him and other beings can be proved, the foundations of theology are laid in the natural, and not in the revealed, order of things.

Now, it is true that attempts have been sometimes made to frame a system of theology entirely out of the religious truths which may be learned from natural sources, that is, from the constitution of the human mind, and from the phenomena of the natural universe. Such truths constitute Natural Religion, and form the subject of the science of Natural Theology. But the vast majority of religious systems are founded on the supposed existence of a divine revelation; and for this reason the science of theology is generally considered as a science of Revelation. Moreover, if it be true that a divine revelation has been given from God to man, it will follow that that revelation cannot possibly be contradictory to any of the truths of natural religion: also many reasons might be urged to show that such a revelation, when completed, would contain in itself at least all the truths of natural religion, and, as a matter of fact, all the alleged revelations in existence claim to teach everything which might be learned from nature concerning God. Hence the theology which is founded on revelation must include within itself the theology which is founded on natural religion. For this reason the grand foundation of theology is usually understood to be revelation, to which natural religion is a valuable but not necessary auxiliary; and it has even been disputed whether it is an essential part of a theologian's duty to establish the consistency between the doctrines of natural and revealed religion.

By way of introduction to the Christian religion, theology is founded entirely upon the canonical books of the Old and New Testament.

III. DIVISIONS OF THE SCIENCE.

1. With reference to its foundation, it is divided, as explained in the preceding paragraph, into Natural and Revealed, or positive. The latter word is used to indicate that the foundations of revealed theology are the expressed will of God; just as we speak of positive laws.

The term positive theology is also used to describe any system of theology which rests upon authority, as, for example, the system embodied in the formularies of a particular church. See below, under the head of Dogmatics.

2. According to the method of treating the subject, it is divided into popular or biblical, and systematic or scholastic theology.

3. According to the part of the subject which is treated of, it is divided into theoretical and practical theology. Of these the former includes—(1) The knowledge of the documents which contain the revelation, the proof of their authority, and the explanation of their meaning, that is, Exegesis; (2) the examination of that faith, and the discussion of the truths so revealed, that is, Systematic Theology; (3) the workings and changes of religion among those who have professed it, or Historical Theology.

Practical Theology has for its subjects the duties of practical religion, in the form of vocation, or the ordination of men; and with reference to the latter, it is divided into (1) Homiletics, or preaching; (2) Catechetics, or teaching; (3) Liturgics, or worship and the administration of the sacraments, and (4) Pastoral theology, or the care and government of a church.

IV. OF DOGMATIC THEOLOGY, OR DOGMATICS.

This is a very useful term, which is chiefly employed by German writers. It may be defined as the science of exhibiting clearly, and of tracing to their results, the doctrines taught by revelation. It means more than the term systematic theology. The province of the latter is to found the theories and dogmas, the system of theorems and hypotheses of a connected system, in whatever manner may seem most convenient to the frame of the system; but dogmatic theology aims at forming a system which shall be accepted as binding by a large body of religious professors. The former systems have been adopted as a scientific form of a connected system, in whatever manner may seem most convenient to the frame of the system: it is systematic theology, with the idea of authority superadded.

This may perhaps be made clearer by a reference to other branches of science. The natural philosopher, for example, observes certain phenomena, which he soon finds to have in them some points of connection or similarity; and by arranging the phenomena with reference to those points, he has reduced his knowledge of natural philosophy to a sort of systematic, or as it is often called, dogmatic, form. He has drawn from his observations; the analogies he thinks he has detected may not really exist; but still the system he has framed may be for him a convenient classification of the observed phenomena; his system is a theory. But suppose him to have detected real causes of the observed phenomena, and to trace them to further results: suppose that he frames a system of natural philosophy upon the principles which he has thus detected; and that this system is received by a number of philosophers, who observe it, and who adopt it as a system of phenomena: then his theory has gained the element of authority, and it may be called a dogmatic theory. The former kind of theory may serve as an illustration of what is meant by systematic theology; the latter, of what is meant by dogmatic theology.

Now, in the case of the Christian revelation, it is a remarkable fact that the documents which contain it present no systematic form. The truths revealed in them, considered separately, may be called dogmas, since they all contain the element of authority; but as they are not systematically arranged, they do not form a system of dogmatic theology. But to such a system they might be reduced by a person who fully understood them in all their bearings; and suppose we have been so fortunate as to have such a person, his complete system would be a perfect system of dogmatics: absolutely true if the revelation were a true one; and therefore absolutely binding on all who accepted the revelation as true, and were thereby made dogmatics. But this attempt has been made again and again: many systems of theology have been framed, each claiming to give an exposition of the word of God at once true and scientific. It is also a matter of fact that these systems have presented divergent and conflicting results: but the human mind has been accepted as true by bodies of Christians; and they therefore form, to those who accept them, systems of dogmatic theology: and in many cases these systems are embodied in creeds, or confessions of faith, which then become for all future time the dogmatics, or positive theology, of those who accept them.

It has very naturally been usual for persons adopting a system of dogmatics to look upon their system not only as probably true, but as absolutely true. It is often given to it the title of orthodoxy (orthodoxia, the right belief), applying to every other system the name of heterodoxy (heterodoxia, another belief, i.e. than the right one). But it is deserving of notice that there are some subjects upon which a particular opinion has prevailed among Christians, that the word orthodoxy is applied to that opinion, for the sake of convenience, by persons who do not intend thereby to give their assent to the absolute correctness of the opinion. Such is the case with the doctrine of the divinity of Christ.
which some particular system of dogmatics is defended, or some other system attacked.

V. HISTORY OF THEOLOGY.

It is by no means intended to give under this head a sketch of the history of the Christian church, considered with reference to the development and diversities of theological opinions within it. Such a statement would be, properly speaking, a history of theology, and indeed such a history is at present a great desideratum in our literature. But the information which would be given on this head will be found in the articles the existence, commonly called the laws of nature, he has left them to the government of those laws, and concerns himself no more with his creation; or in other words, this system acknowledges the existence of a fiendish spirit, a Deity of the universe, and the existence of matter itself; and the various shades of Pantheism, which suppose an intelligent principle (anima mundi) to be inseparably connected with everything that exists, and to pervade the whole creation.

There is another system which stands apart both from Naturalism and Revelation, namely Scepticism, the leading principle of which is that in metaphysical inquiries, or in short in all subjects which do not admit of mathe-matical demonstration, certainty is impossible, and consequently that neither from nature nor from a supposed revelation can we derive a sure religious belief nor a rational system of theology. [Skepticism.]

These systems deserve notice in connexion with the history of dogmatics, because the differences which the various classes of subjects as those which are embraced in theology; and they belong particularly to the history of Christian thought. Inasmuch as at every period these systems have been brought more or less into direct collision with Christianity itself. But according to our more restricted definition of theology, as the science which is founded upon a divine revelation, and more especially as the science which has for its subject the religion of the Old and New Testaments, it will be found that the principal varieties in theological systems have arisen out of different opinions concerning that revelation itself, either with reference to the degree of its authority or to the mode of its interpretation.

1. With reference to the former point, the authority of the Scriptures, it would seem an axiom that every person who accepts them as a divine revelation must receive them as of full authority in matters of faith, and consequently that every system which rests on this foundation of unquestionable authority of the Scriptures. For this reason it would appear that all questions respecting the authority of the Scriptures are rather introductory to theology than a part of the science. But in point of fact different views have been entertained on this subject, as to the extent to which those who profess to receive the Christian religion, and therefore such opinions are considered to form a part of Christian theology.

Now with reference to this point every possible variety of theological opinion may be included under the two great divisions of Supernaturalism and Antinaturalism or Rationalism; the former word being used for that theology which rests professedly on a special, supernatural revelation from God, and the latter for that system which rejects all that is supernatural in such a revelation. The terms Rationalism and Natural Theology, though etymologically meaning the same thing, are yet understood as implying very different ideas. Both make the foundations of theology to rest upon the knowledge concerning God which may be learned by mere natural means, but in natural theology the idea of a revelation is not even entertained, and consequently a system which seeks to regard the Scriptures as possessed of some degree of authority, and indeed as upon the whole containing in some form or other the elements of religious truth.

The great question between supernaturalism and rationalism relates to the inspiration of the Scriptures. The adherents of the former system, though they differ respecting the mode in which supernatural information was conveyed to the minds of the sacred writers, agree in the great principle that they did receive such information as to preserve them from all error in the statement of religious truth. Rationalists, on the other hand, either reject the dogma of inspiration altogether, or understand by it nothing more than that by the ordinary processes of nature. The writers of the Scriptures were brought into the best state for exercise while they were composing the Scriptures. Generally speaking, the rationalists admit the writers of the Scriptures to have had better means of acute reflection and independent discretion than persons could acquire; and therefore, while reserving to themselves the liberty of choosing what they will believe and what they will disbelieve, they upon the whole accept the facts and opinions contained in the Scriptures as a more or less degree dogmatics of the 19th century are almost indistinguishable from some of the forms of naturalism. [Rationalism.]

2. Supposing the Scripture to be received as strictly divine revelation, the questions arise:—By whom, and in what principles, are they to be interpreted?

The former of these questions has been called the Protestant and Catholic, or the biblical and syncretic systems of theology. The fundamental principle of the Protestant or biblical system is that the Scriptures are to be interpreted by each individual reader according to his understanding, or by the aid of the church, and forming in fact a system of dogmatic theology, from which by no individual is at liberty to depart upon the evidence derived from his own research. The Protestant theology may be supernaturalistic or rationalistic, according as it admits or rejects the dogma of the assistance granted to the inquirer and at the same time branches out into two great divisions, which may be called popular and critical theology. The popular theology proceeds to be derived from the obvious meaning of the letter of Scripture, without any external aid: the critical theology is based on the principle that Scripture has been brought more or less into direct collision with Christianity, and forming in fact a system of dogmatic theology, from which by no individual is at liberty to depart upon the evidence derived from his own research. The Protestant and Catholic systems is in the use they make of the body of historical testimony to the doctrines of Christianity. The Catholic system esteems it the privilege of the priv. ated or the certain possessor and the author of religious truth. In many of the ancient Cypri-
tian writers it recognises members of the true church and authorised teachers in it; and therefore it regards the doctrines taught in their writings as the true doctrines of Christ. The obvious doctrine presented by the different opinions of various writers is rendered in various ways.

Vincent of Lirins has stated the Catholic dogma in the following form:—That which has been held always, everywhere, and by all, is true. (Quaest. temp. 7. quaest. 6.) But whereas it is ever the apparent degree of freedom thus left to believers was abundantly used, and how the apostolic age different opinions had sprung up, exemplifying nearly all the principles above described. [HERETICS.] To restore unity to the church, and especially to settle the orthodox doctrine and the object of the Council of Nice, in the creed of which we find the first appearance of a system of positive theology. [NICE, COUNCIL OF; NICEAN CREED.] The immediate consequence of this Council however was to exasperate the very controversy which it professed to settle, and which continued to rage during the following centuries.

Arianism; Nestorianism; Theodoretus.] These and other controversies led to the frequent meeting of councils [ECUMENICAL COUNCILS], and to the settlement of the canon of Scripture about the end of the fourth century [Canon]; while at the same time the episcopal system became more and more firmly established; and from all these causes theology acquired more and more the form of a positive science. Theologians sought for satisfaction in the scholastic philosophy; those of the latter made repeated attacks on the ruling system, which at last produced the Reformation in Germany and the establishment of the Greek and Roman churches. [CATHOLIC CHURCH; GREEK CHURCH.] The positive system evidently leaves little liberty to the calculations of the human mind, or to the practice of spurious or turbulent individuals. They have sought for satisfaction in the scholastic philosophy; those of the latter made repeated attacks on the ruling system, which at last produced the Reformation in Germany and the establishment of the Greek and Roman churches. [CATHOLIC CHURCH; GREEK CHURCH.] The positive system evidently leaves little liberty to the calculations of the human mind, or to the practice of spurious or turbulent individuals.

...
THEON, a eminent Greek writer, who was a native of Samos, and appears to have lived in the time of Philip and Alexander of Macedon. He was reckoned one of the four sages; and he was one of the seven who invented and made virtue of his passion, and the gracefulness of his execution. (Quintilian, xii, 10, 6.) We know the subjects of a few of his works, but the execution is spoken of in such a manner that the excellence of the artist cannot be doubted. They (i.e., the works) contain two of the first, one representing Oræstes in the act of killing his mother (compare Plutarch, De Audacia Poet., p. 18, ed. Frankl.), and the other Thamyris playing the cithara. A description of a splendid painting by Theon representing a warrior, who, animated by a martial spirit and eager to fight, is hastening to meet the enemy, is given by Aelian (Var. Hist., ii. 44).

THEON, AELIUS, a rhetorician and grammarian of Alexandria, who, according to some critics, lived about A.D. 500, but, according to a more probable opinion, about A.D. 315. According to Suidas he wrote a commentary on Xenophon, on the orations of Demosthenes and Isocrates, a work on rhetoric, one on the structure of language, Prognostics, and on other books. With the exception of the Prognostics (προγνοστικα), or practical rules on rhetoric, derived from the examples of the best Greek orators, there is no work extant that can be ascribed to him with certainty. His Prognostics excel those of Plato, in elegance, precision, and clearness, and were, like those of Aphiomnus, long used as a text-book in schools.


Kuster (on Suidas, ii. p. 182) ascribes to Theon also the still extant scholia on Aratus, Apollonius Rhodius, Lyco- phron, and Theocritus. The italics in the text which are contained in Aldus's and Cujasius's collections of epistles, are likewise ascribed by some writers to Theon, while others assign them to Iambus or Proclus. A separate edition of them appeared at Leyden, 1614, 12mo.

(A. Westermann, Geschichte der Geschicht., vol. ii., p. 230, &c.)

THEON, the Elder of Smyrna, was the contemporary of Ptolemy (who cites one of his observations), and the younger Theon, the Younger, the historian, and the more celebrated mathematician and astronomer. As a mathematician and astronomer he is known in Greek, in the Basle edition of Ptolemy (1528); and in Latin, in Peter of Corunna's work on Aratus which is said to have been his, but Grotsch of the opinion that it is the work of some hands, for which he gives good reasons. The whole of the commentary on the 'Syntaxis' is preserved, except one or two books. A full account of it is given in Dursch's 'History of Astronomy,' which observes that it helped but little in the understanding of the 'Syntaxis,' and gives none of the additional information which is usually expected from it. This work, with a commentary on Kepler's 'Harmonices Mundi,' was published by Haisma (Greek and French, Paris, 1823-25, 3 vols.). They contain a description of the modes of astronomical calculation in use at the time.

It only remains to speak of Theon as a commentator on Euclid, a character which some still persist in giving him. The fact is, that Theon, as he himself informs us in the commentary on Ptolemy, gave an edition of Euclid, with the scholia and there an additional proposition. (Grob. p. 155.) Some manuscripts of Euclid call this a commentary, and our fathers of the middle ages got the notion that all the demonstrations were commentaries See Thesaurus which is prefixed to the editions of Euclid. For instance, in the folio of 1416 (Stephens) on which the propositions are given twice, namely, Archimedes' translation (called Campanus) from the Arabic, and Zamboro's translation (called Campanus) from the Latin of Valenciennes. These are the demonstrations are headed Eulidei ex Campano Valesii, and other demonstrations are headed Campanus and Thesaurus Zamboro. Again, in 'I quindici Libri degli Elementi' of Euclid, of Greco tradotti in Lingua Tedesca,' Rome, 1544, the first book is prefixed a commentary. The editor has kept his word, and given all believing he be Euclid's: had he meant to give demonstrations, his title would have been 'Euclid, with Theon's Commentary.' Many editions professing to give Euclid in Greek and Latin have the commentaries only in Greek, a necessity.
Theophanes, a native of Mitylene, was a contemporary and friend of Pompey the Great. During the war between Rome and Mithridates, when the Mityleneans supported the king and delivered up to him the Roman general Manius Aquilius, Theophanes, who refused to take any part in the revolt, was expelled, and went to the camp of Sulla. (Velleius Pat., ii. 18.) In Italy Theophanes became acquainted with Pompey, formed an intimate friendship with him, and accompanied him on his expeditions. After the termination of the war against Mithridates, Theophanes endeavoured to perpetuate the exploits of his friend. His history, which is now lost, appears to have been treated with his influence and to have been accompanied by the civil war in which he procured Theophanes the right of a Roman citizen. (Cicero, Pro Archit., 10.) Although Theophanes had been exiled from Mitylene, he bore no grudge against his country, and on the return of Pompey from Asia he accompanied him with his influence, and induced him to restore to the Lesbians their liberty and the privileges of which they had been deprived for having supported the king of Pontus. In B.C. 59 Theophanes was sent by the senate of Rome as ambassador to Ptolemaeus Auletes of Egypt, to carry to him the decree of the senate, which guaranteed him the sovereignty of his country. His conduct on this mission is blamed, because he is said to have endeavoured to direct events according to the influence of his master, the civil war and his success. Theophanes continued faithful to his friend, and supported him with his advice, and it was on his well-meant suggestion that after the battle of Pharsalus Pompey fled to Egypt, where he was murdered. After this event Theophanes, where he appears to have spent the last years of his life in retirement. After his death the Lesbians paid divine honours to his memory for the benefits which he had conferred upon them. His son, M. Pompeius Maer, held the office of praetor in the time of Augustus, and was afterwards appointed governor of Asia; but in the reign of Tiberius he and his daughter put an end to their own lives, in order to avoid the punishment of exile to which they had been condemned. Theophanes was the author of several works, both in prose and in verse, but very little of them has come down to us. Plutarch's Life of Pompey is chiefly based on the historical works of Theophanes, and we may thus possess more of it than we are aware; but beyond the form of the life of Theophanes, which is very little used in art, is the story of the Muses in the 'Mémoires de l'Académie des Inscriptions et Belles-Lettres,' vol. xiv., p. 143, &c."

**THEOPHILES NONUS. [NONUS.]**

**THEOPHILUS, a Constantinopolitan jurist, who lived with Justinian (527-565). He was a distinguished teacher of jurisprudence at Constantinople (antecessor), and, at the command of the emperor, he was employed among those who compiled the 'Digest'; and afterwards he undertook, along with Dorotheus and Tribonian, to compose the 'Institutes,' that is, the elements of jurispudence, which was part of Justinian's plan. This Theophilos is generally supposed to be the author of the Institutes,' though it is maintained that the paraphrase is found in Theophilus himself, but was taken down from his lectures by some pupils. It was discovered in the beginning of the sixteenth century by Viglius ab Ayttia Zuchheimus at Basle, and dedicated to Charles V. (Basle, 1534, fol.). The work was frequently reprinted during the last century, but the last and best edition is that of W. O. Retz in 2 vols. 4to., Hagen, 1751. It contains a Latin translation and the notes of previous editors of Retz. The most interesting dissertation on the obscure and much disputed history of Theophilos. Theophilos also wrote a commentary on the first three parts of the 'Digest,' which however is no longer, with the exception of a few fragments which are incorporated in Retz's edition of the 'Paraphrase of the Institutes.' The value of the paraphrase of Theophilus in establishing the text of the 'Institutes' may be estimated by an examination of the edition of the 'Institutes' of Gaius and Justinian by Klenze and Bicking, Berlin, 1830. (Institutionum D. Justiniani Sacrat. Princip. Prisco- trium; P. B. Degen, Bemerkungen über das Zeitalter des Theophilus, Linneburg, 1806, 8vo.; Zimmern, Geschichte des Rom. Privatrechts, Leipzig, 1892.)

**THEOPHILUS PROTOPATHARIAUS [Θεόφιλος Πρωτοπαθάριας], the author of several Greek medical works, which are still extant, and of some which go under the name of 'Philotheus' and 'Philaretus.' Everything connected with his life is very vague, and the time when he lived, is uncertain. He is generally styled 'Protopatharicus,' which seems to have been originally a military title given to the colonel of the bodyguard of the emperor of Constantinople (Σπαθαρίτις, το ευρυτοπαθέας). Theop. Protopathar., in some manuscripts however he is called 'Philosophus' (Lambec., Biblioth. Vindob., lib. vii., p. 352 ed. Kolf.); in others, 'Monachus' (ibid., Lib. vir. 1. 11, p. 244, 245); and it is sometimes said he was a colonel in the 'Puls. ap. ermerin., Anecd. Med. Gr.;' or 'Iatrosofista' ('Iarrōσoφίστας το τόποι Ὀπωρ., ed. Fed. Morell, Paris, 1808, 12mo.)

Theop. Protopath. to the emperor Heracliaus (Fabricius, Biblioth. Graec., vol. xii., p. 695, ed. vet.); that he arrived at high professional and political rank, and that at last he embraced the monastic life. It must however be confessed that all this is quite uncertain, for, in the first place, Freind, in his 'History of Physic' (Opera, pp. 448, 449, ed. Lond., 1738), after remarking how little credit is sometimes due to the titles prefixed to manuscripts, doubts whether Theophilos was a tutor of St. Stephen, and thinks, from the barbarous words that he makes use of (such as vikos, θρησκευόμενοι, De Corp. Hum. Fabr., p. 177, 1, 2, ed. Oxon.; vikos, vika., ibid., p. 181, 1, 11, 12; vikos, ibid., p. 135, 1, 11; vikos, epieia, Prat. Med. et Inf. Graecit.); he was a person mentioned by St. Luke; others place him as early as the second century after Christ, and others again as late as the twelfth. He is generally supposed to have lived in the time of the emperor Heraclius, who reigned from A.D. 610.
to 611; but this opinion rests only on the conjecture of his having been the tutor of Stephanus Atheniensis. The Oxford editor thinks, however, that he probably is the same person who is addressed by the title Protopsaltanmus * by Photius (Epit. 123, p. 104, ed. Montacq., Lond., 1891), and who therefore must have lived in the ninth century. He was a Christian, and a monk, as appears from almost all his writings; in his physiological work especially, he everywhere points out with admiration the wisdom, power, and goodness of God as displayed in the human body. (See De Corp. Hum. Fabr., pp. 1, 25, 39, 127, 183, 229, 233, 236, 239; Excerpt. c. 19, p. 408; De Puls., in fine, p. 77.) He appears to have embraced in some degree the Peripatetic philosophy. (De Corp. Hum. Fabr., pp. 2, 3, 4, 103, 105, 222, &c.; Mart. Rota, Pref. to Philothei Comment. in Hippocr. * Aphor.*)

Five of his works remain, of which the longest and most interesting is an anatomical and physiological treatise, in five books, entitled Περὶ τῆς ἀνθρώπου καρκασιάς, De Corporis Humani Fabrica. It contains very little original matter, as it is almost entirely abridged from Galen's great work, 'De Usu Partium Corporis Humani,' from which however he now and then differs, and whom he sometimes appears to follow or rather misunderstand in the fifth book; he has inserted large extracts from Hippocrates, 'De Geniture,' and 'De Natura Pueri.' He recommends in several places the dissection of animals, but appears never to have examined a human body; in one passage he advises the surgeon to stay at home, or, if necessary, of these animals can be procured, to take whatever he can get, 'but by all means,' adds he, 'let him dissect somewhat.' The work was first translated into Latin by J. P. Crassus, and published at Venice, 1586, 8vo, together with Hippocrates; 'De Purgantibus Medicamentis.' This translation was frequently reprinted, and is inserted by H. Stephens in his 'Medice Artis Principes,' Paris, 1667, fol. The manuscript from which Crassus made his translation is lost; but the Latin is defective, in some places more complete than that which was used by Gull. Morell in editing the original text, which was published at Paris, 1555, 8vo, in a very beautiful type, but without preface or notes. This edition is now become scarce, and was reprinted, together with Crassus's translation, by Fabricius, in the twelfth volume of his 'Biblioth. Graec.,' p. 783, sq., Hamb., 1724 and 1740. Two long passages which were missing in the fourth and fifth books were copied from a manuscript, and inserted by M. Mustiari and Demetri, Schinas in their collection entitled Συλλογὴ Παρασκευὰς Ἀνεξόδων Ἐξλημοσίων μετὰ Σχηματισμῶν, Ver., 1817, 8vo. The last and best edition of this work is that by Dr. Greenhill, which has lately been printed at the University press, Gr., 1839, 8vo. The editor says in the preface that he has taken as the basis of his edition the manuscript at Venice mentioned above, as being more complete than any other that he had met with; that three other manuscripts at Paris have been collated; that several passages have been corrected by referring to the original parts of Galen and Hippocrates from which they were copied; that Crassus's Latin version has been retained, as representing the readings of a manuscript no longer in existence; and that the notes are intended rather to illustrate and explain the Greek technical terms, than to correct all the anatomical errors and supply the deficiencies of the author.

Another work of Theophrastus is entitled Περὶ Ἠλέους τῶν Ἐπιστήμων Ἀναφημάτων, Commentarii in Hippocratis Aphorismos, which also seems to be taken in a great measure from Galen's Commentary on the same work. It was first published in a Latin translation by Lucius Syrace, 1546, 12vo, under the name of 'Philoleus.' The Greek text appeared for the first time in the second volume of F. R. Dietz's 'Scholia in Hippocrateum et Galenum, Regim. Pruss., 1840.

In the manuscript of De Ovibus, De Uris, contains little or nothing that is original, but is a translation by Tendusius, who was highly esteemed in the middle ages. It first appeared in a Latin translation by Pontius (or Pontius) and was reprinted in a manuscript collection known by the name of the 'Articella.' It was first published in a separate form at Basle, 1533, 8vo, translated by Albanus Torinus, together with the treatise 'De Pulbis,' and this version was again reprinted in 1536, with notes, inserted by H. Strebel in his 'Medice Artis Principes.' The Greek text was published without the name of Theophrus, under the title 'Astrosophistae de Urinis Liber Singularius,' &c., at Basle, 1536, 4to, and was reprinted in 1538, by G. Scoto, with which edition was inserted entire by Charter in the eighth volume of his edition of the works of Hippocrates and Galen. The best edition is that by Thom. Guidot, Lat. Bat., 1703, 8vo, Gr. and Lat., and again with a new Latin version, in 1726, an improved text has been much improved by many readings of a manuscript in the Bodleian Library at Oxford, there is a new Latin version by the editor, and also copious and learned prolegomena and notes. The Greek text of the treatise De Uris medicoavit, is inserted by J. L. Celer in his 'Physici et Medici Graeci Minorum,' Berne, 1841.

A short treatise, Περὶ Ἀναδείξεως, De Extravasati Alvei, was first published by Guidot, in Greek, and a Latin translation by himself, at the end of the sixtis was first published by Elidel in his 'Physici et Medici Graeci Minor.'

The last of the works of Theophrus that remains, is a treatise, Περὶ καταστροφῆς, De Pulbis, which first appeared in a Latin translation, under the name of 'Philoleus,' and was reprinted in 1538, by Pontus, and again in a separate form at Basle, 1533, 8vo, translated by Albanus Torinus, together with the treatise 'De Urinis' mentioned above. It was reprinted at Strassburg, 1538, 4to, and again by Bures in his 'Medice Artis Principes.' The Greek text was first published by F. Z. Ermerins in his 'Anecdotae Medicae Graeca,' Lat. Bat., 8vo, 1840, together with a new Latin translation.

The text is taken from one manuscript at Leyden and several from manuscripts in the Bodleian Library, and is reprinted in the edition of Guidot. The Latin translation under the name of 'Philoleus.'


THEOPHRASTUS, the name of a genus of plants dedicated to Theophrastus. It was originally called Eresus by Plinius, but afterwards altered by Linnaeus. It belongs to the natural order Myricaceae, and is a small tree with five or six leaves, and crimson or purple flowers, opening in the spring, and taking on a lustrous greenish at top, giving it a resemblance to a pine tree. The flowers are of a white colour, and are arranged in terminal racemes, which are very short, and hidden among the leaves of the plant. The calyx is campanulate and carthaginous. The corolla is also campanulate, with a short tube, and has a dilated throat, gland with an erectly angularly-lobed, fleshy, arched ring; the limb is spreading. The stamens are five, combined with the tube of the corolla; anthers horned. The fruit is a crustaceous spheroid, about the size of a crab-apple, with the seeds immersed in the placenta. There is but one species, named after Jussieu, T. Jussieut. This plant is the same as the Arcturus of Linnaeus. It is a native of the mountains of St. Domingo, and is much cultivated on account of its long handsome holly-like leaves. It may be propagated by cuttings, and grows well in a soil of peat, loam, and sand. THEOPHRASTUS was born at Eresus, in the island of Lesbos, in the year 370 B.C.; he is uncertain; some writers state it to be a.c. 371; others place it in 400. According to Hieronymus (Epit. 2, ad Nepotianam) died in the year a.d. 256, and, as some say, at the age of 85 (Diogenes Laert., v. 40), or, according to others, at the age of 95. He died, according to the same author, on the 23rd of December, and the date of his birth uncertain. When a youth his father Melantes sent him to Athens for the purpose of studying. Here he was first a pupil of Plato, and became an intimate friend of Aristotle, who, charmed with his talents and his beautiful pronunciation, is said to have given him the name of Theophrastus (one who speaks well).
The real name of Tyrtamus was Theophrastus. (Quintilian, x. 1. 33.) In the early days of Plato, when Speusippus had placed himself at the head of the Academy, Theophrastus, with a number of the former disciples of Plato, left the Academy. Plutarch has preserved a bare account of an event in the life of Theophrastus, and states that he had just opened his school (the Lyceum), Theophrastus ranged himself among the heroes of his friend, and cultivated most zealously all the departments of philosophy and science of which Aristotle was then the great master. When Aristotle himself withdrew, Theophrastus became his successor in the Lyceum, and acquired great reputation in his new sphere, not because he created any new system of philosophy, but because he combined the knowledge and profundity of Aristotle with the fascinating eloquence of Plato. The number of his pupils on one occasion is said to have amounted to two thousand (Diogenes Laert., v. 37), who flocked around him from all parts of Greece. This popularity, and the influence of his writings, so strong that they were only twenty-five years old, led him to rule through the practical character of his philosophy, roused the indignation and envy of those who saw in him an obstacle to their designs. The consequence was that Agnoides, who probably acted on behalf of many others, brought a suit against him, which was interfered and saved him. After this event he enjoyed undisturbed peace for several years, and he saw his school, which was visited by the most eminent men of the age, daily increase. The tranquility which he enjoyed was however chiefly owing to the friendship of Camotius (Venicius, 1551-52). These twenty-three chapters were opened with a Latin translation by Maximus Planudes, who is known to have written a commentary on the 'Characteres' of Theophrastus. The edition of the 'Characteres' is by Wilibald Pyrckheimer, Nürnberg, 1527, 8vo., which contains only fifteen chapters, was reprinted with a Latin translation by Theodorus Vitellius, Basle, 1617, 8vo., and 1641, fol. These first two editions were added in the edition which appeared at Parma, 1786, 4to. A still more perfect, and in fact the first complete edition, of that of J. P. Siebeneckes, which was edited by Goetz, Nürnberg, 1798, 8vo. In 1799 there appeared two new editions, the one by Cores (Paris, 8vo.), and the other by S. Aerne, (Rotterdam, 8vo.), the first edition, which is very useful, is that of Fr. Ast, Leipzig, 1610, 8vo., has been translated into French by Jean de la Bruyère (Paris, 1686, 12mo., often reprinted, and lastly edited by Arnauld, Paris, 1602), and by Levesque (Paris, 1782, 8vo., and 1808, 8vo.), the English translations are those of C. H. Rommel (Penzlin, 1827, 12mo.), and J. H. Hogg (München, 1821, 8vo.). The recent several English translations: the latest is by F. Howell, London, 1824, 8vo. The first by Eustace Budgell, London, 1713, 8vo., is generally called the best. There is also a translation into modern Greek by Larbaris, Vienna, 1816, 8vo.

A Fragment of a work on Metaphysics, which consists of one book entire (Τοις υπάρχουσι ψιλοτροπίας ἐπικείμενοι). This work was not mentioned by Andronicus of Rhodes in his catalogue of the works of Theophrastus, but it is ascribed to him by Nicolaus Damaesium. It is printed in the early editions of the works of Theophrastus in connection with those of Aristotle, as in those of: Venice (1447), Basle (1541), Venice (1592), and in that of Sylburg (Frankfort, 1587). The last edition is that of A. Brandis, who annexed it to his edition of Aristotle's 'Metaphysics' (Berlin, 1823, 8vo.).

I. Characteres, or ψιλοτροπίας, consisting of thirty, or, according to Schneider's arrangement, of thirty-one chapters. In this work the author gives thirty characteristic descriptions of vices, or rather, of the manner in which they show themselves in man. The descriptions however are mere sketches, and form a gallery of bad or ridiculous characters. Many modern critics have maintained that the work in its present form is not to be regarded as a work of Theophrastus, but that it is either an abridgment of a greater work of this philosopher, or a collection of descriptions of vicious characters, compiled either from the writings of Theophrastus, or from those of others. Neither of these opinions is compatible with the statement of Diogenes Laertius, Suidas, and other late writers who mention σουλέιοι ψιλοτροπίαι among the works of Theophrastus; for the 'Characteres' which we now possess may have been compiled and published in this form long before their time. Either of these hypotheses would support the proposition that nearly all the definitions of the vices that occur in the book contain some error, which, it must be presumed, would not have been the case if the work had been written by Theophrastus. Other critics, on the contrary, have indicated the 'Characteres' as a genuine work of Theophrastus, and have attributed all its defects and inaccuracies to the bad MSS. upon which the text is based. This opinion has received considerable support from the discovery of a Munich codex, part of which was published by Fr. Thiersch in 1832, in the 'Acta Philologorum Monacensium' (vol. iii., fasc. 3). This MS. contains the titles of all the thirty chapters, but the text of the last seven chapters and the introduction, which were edited by Thiersch, are considerably shorter than the common text, the language is perfectly pure, and there is very little doubt that this is the genuine text of the work of Theophrastus, and that the common text was drawn from other works. The first five chapters were increased by five new ones from a Heidelberger MS. in the excellent edition of Casaubon, of 1599 (reprinted in 1612 and 1617, 8vo.). The last two chapters were added in the edition which appeared at Parma, 1786, 4to. A still more perfect, and in fact the first complete edition, of that of J. P. Siebeneckes, which was edited by Goetz, Nürnberg, 1798, 8vo. In 1799 there appeared two new editions, the one by Cores (Paris, 8vo.), and the other by S. Aerne, (Rotterdam, 8vo.), the first edition, which is very useful, is that of Fr. Ast, Leipzig, 1610, 8vo., has been translated into French by Jean de la Bruyère (Paris, 1686, 12mo., often reprinted, and lastly edited by Arnauld, Paris, 1602), and by Levesque (Paris, 1782, 8vo., and 1808, 8vo.), the English translations are those of C. H. Rommel (Penzlin, 1827, 12mo.), and J. H. Hogg (München, 1821, 8vo.). The recent several English translations: the latest is by F. Howell, London, 1824, 8vo. The first by Eustace Budgell, London, 1713, 8vo., is generally called the best. There is also a translation into modern Greek by Larbaris, Vienna, 1816, 8vo.

2. A Fragment of a work on Metaphysics, which consists of one book entire (Τοις υπάρχουσι ψιλοτροπίας ἐπικείμενοι). This book was not mentioned by Andronicus of Rhodes in his catalogue of the works of Theophrastus, but it is ascribed to him by Nicolaus Damaesium. It is printed in the early editions of the works of Theophrastus in connection with those of Aristotle, as in those of: Venice (1447), Basle (1541), Venice (1592), and in that of Sylburg (Frankfort, 1587). The last edition is that of A. Brandis, who annexed it to his edition of Aristotle's 'Metaphysics' (Berlin, 1823, 8vo.).

3. A Dissertation ψιλοτροπίας, that is, on the Sense and the Imagination. There is a paraphrase of this work on this work by Priscian, the Lydian, who lived in the sixth century of our era. It was first edited by Trincavelli, Venice, 1536, fol., with Priscian's paraphrase, and: Venice (1447), Basle (1541), Venice (1592), and in that of Sylburg (Frankfort, 1587). The last edition is that of A. Brandis, who annexed it to his edition of Aristotle's 'Metaphysics' (Berlin, 1823, 8vo.).

The 'History of Plants,' by Theophrastus, ψιλοτροπίας, is a work of considerable length, and numerous to be noticed here.
Theophrastus was one of the earliest writers on botany that was written with anything like scientific precision. The work is divided into ten books, of the last of which only a fragment is preserved. The matter is arranged upon a system by which plants are classified according to their species; the names of the species, their localities, their size as trees or shrubs, their flowers, and according to their uses as furnishing juices, poisons, potherbs, and seeds which may be eaten. The first book treats of the organs or parts of plants; the second of the reproduction of plants, and the times and modes of sowing. The third book describes the mode of reproduction in palms, and compares it with the caprification of figs. The third, fourth, and fifth books are devoted to a consideration of trees, their various kinds, the places of their occurrence, and the economic uses to which they may be applied. The sixth book treats of undershrubs and spiny plants; the seventh of potherbs; the eighth of plants yielding seeds used for food; and the ninth of those plants that yield useful juices, gums, resins, or other exudations. In this work there is much original and valuable observation, but at the same time it is intermixed with many absurd statements with regard to the functions and properties of plants. It is probable that much of the value of this work would have been lost, if it had not been published in this country of his home observation, as he is known to have travelled about Greece, and to have had a botanical garden of his own, whilst he was probably dependent on the statements of soldiers and others connected with the army, for information on Indian, Egyptian, and Arabian plants.

Theophrastus wrote also another work, "On the Causes of Plants, ερατονομια ανθρωπονια. This work was originally in eight books, six of which remain entire. It treats of the growth of plants; the causes which influence their fecundity; of the times at which they should be sown and reaped; the modes of preparing the soil, of munuring it, and of the instruments used in agriculture; of the odours, tastes, and properties of many kinds of plants. In this work the history of plants, the vegetable kingdom is considered more in reference to its economical than to its medical uses, although the latter are occasionally referred to. In both works there is much valuable matter that deserves the attention of the botanist, and a very little knowledge of botany will enable the reader to separate the chaff from the wheat. Both Haller and Adanson complain of the errors which translators and editors of these works have fallen into for want of botanical knowledge. Both works have gone through several editions; they were printed together by the sons of Aldus at Venice, in 1552, 8vo.; and again by Heiniasi at Leipzig, in 1613. The "History of Plants" has been published separately more frequently than the "On the Causes of Plants." The last edition is that of Bodeus & Stahl, which was published by his father after his death. It contains a preface by Corvinus; the Greek text, with various readings; the commentaries and remarks of Constantinius and J.C. Scaliger; the Latin translation of Gazer; very copious annotations by various writers; a very copious index, and the whole is illustrated by woodcuts. The cuts however are very inferior, and are copies of those in the works of Dodonaeus, which seem to have been copied into nearly all the works published on botany at this period. It appeared at Amsterdam in 1644, folio. The latest edition of this work was published at Oxford, in 1813, by Stocke-house. This edition is accompanied with a Syllabus of the genera and species of the 500 plants described by Theophrastus, a glossary, and a catalogue of the editions of the botanical works of Theophrastus. The "History of Plants" was translated into German by Kurt Strepel, and published at Altona, in 1822, 8vo.

Beich his botanical works Theophrastus wrote many others on various subjects of natural history, which are enumerated with his philosophical works in Diogenes Laertius (v. 42, &c.). One of them, on Stones (ερατονομια λιθων), from which Piny, in his account of stones, derived the greater part of his information, is an extant. He had prefixed it, with a Latin translation and notes, to his work, "De Gemmis et Lapidibus," Leyden, 1647, 8vo. A separate edition, with an English translation, was published by Hill, London, 1746, 8vo.; another, with a French translation, by L. de Bussy, Paris, 1716, 8vo.; and this with a German translation, by Baumgarten, Nurnberg, 1770, 8vo. The last edition is that of Schneider, Freiburg, 1807, 8vo.

Of his two books on Fire (ερατονομια φωτος), only one is now extant; of his other works on natural history, which are much lost, we possess a considerable number of fragments.

The edict of Paris having all the works of Theophrastus a bit of Aldus, Venice, 1496-98, printed, together with the works of Aristotle, in 5 vols. fol. Theodorus Gaza published a Latin translation, which was made from the MS., from which the Aldine text was taken. The first complete Latin translation is that of Plantin, De Plantarum Ligibus, D. J. Biscoff, Lehrbuch der Botanik; Stockhouse, Theop. Hist. Plant.; Fabricius, Bibli. Graeca, iii., p. 108, &c.; Ritter, Geschichte der Philosophie; Krug, Geschichte der Philosophie.

THEOPHILACTUS SIMOCATTU, of Locci, an historian, sophist, and natural philosopher, who was living about 610-629 A.D. He wrote a Universal History (ερατονομια εκλογης), in eight books, from the death of the last emperor of the Greeks, Justin II, in 562, to the murder of Maurice and his children by Phocas, in 602. This work is known by the Latin title of "Historiae Rerum a Maurice Augusto Libri VIII." It was printed, with a Latin translation, by J. Pontanus, at Ingolstadt, 1804, 4to. An improved edition was published by Fabrotti, Venice, 1644, fol., repeated 1729. It is also contained in Niebuhr's collection of the Byzantine writers.

He also wrote 85 short letters, "Epistolas Moralis, Retiae, et Amatoriae," which were published in the collection of Isocrates and Henry Stephens, a work entitled "Problems of Natural History" (Abeam poponis, Quaestiones Physicae), which was published at Leyden, 1596, and at Leipzig, 1853. The two last-mentioned works have been recently edited by Boissoneau, Paris, 1853.

(Fabricius, Bibliotheca Graecae; Scholl, Geschichte der Griech. Lit.)

THEOPHILACTUS, a native of Constantinopel, was archbishop of Athens, the chief city of Greece, about the year 1070 or 1071. He wrote a work on the "Education of Princes" (ερατονομια βασιλεων), for the perusal of Constanti- nus Porphyrogennetous, the son of Michael VII. and the empress Maria. This work forms a part of the collection of Byzantine History.

Theophiliact is better known by his valuable commentaries on the twelve minor prophets and the greater part of the New Testament, which are chiefly compiled from Eusebius, the Bishop of Cæsarea. He also wrote 76 epistles and several tracts. These works were printed in Greek and Latin, at Venice, 1754, fol.

(Fabricius, Bibli. Graecae, vii., p. 765; Landrini's Comm. cit. ii., p. 103; Scholl, Geschichte der Griech. Lit. cit. 297.)

THEOPOMPUSS, an eminent Greek historian, was a native of the island of Chios, son of Damastriatus, and brother of Caucalcius, the rhetorician. He was born about a.c. 390, and was instructed in rhetoric by Isocrates himself when he was in Chios. The historian wrote a work on Chios, which was dedicated to two parties, the most powerful one being in favour of thebes, while a small number of aristocrats supported the interest of Sparta. To the latter belonged Theopompos and his father. The influence of the instruction of Isocrates on the young man appears to have been very great, for although he did not apply his oratorical powers to politics or to speaking in the courts of justice, yet he wrote, like his master, a considerable number of orations, which were recited at rhetorical exercises, and in which he is said to have even excelled his master. When he was obliged to leave Chios, he went with his father to Asia Minor, where he spent several years in travel and study, and acquired great celebrity as a rhetorician. While in this country he wrote a work on law, which was considered an excellent treatise, and in which he is said to have excelled his master. After this event he took an active part in the political affairs of his native island,
and by his talents he became one of the principal supports of the aristocratic party. So long as Alexander the Great lived, his adversaries could not venture anything openly against him; but no sooner had the king died than the popular party again expulsed Theopompus. He now took refuge in Egypt under the protection of Ptolemaeus, the son of Lagus, during whose reign he remained unmolested. But his successor Ptolemaeus Philadelphus was ill disposed towards him, and if Theopompus had not been advised by his country, he would have been put to death. Whither he now fled, what were his subsequent fortunes, and where he died, are questions to which no answer can be given, though it is highly probable that he did not live or shortly after 320 b.c.

The losses of the works of Theopompus, of which we now only possess numerous fragments, is one of the greatest that antient history has sustained. The following list contains the works he is known to have written:

1. An abridgment of the work of Herodotus (Ἑρόδωτου έρατον). This epitome is mentioned by Suidas and several other grammarians. Modern critics think it highly improbable that Theopompus should have undertaken such a task as it was probably the version of the historian, who published it under the name of the historian. The reasons adduced for this opinion are not satisfactory, and it is not improbable that Theopompus may have made this abridgement as a first attempt at history.

2. A more important work was a history of Greece (Greek: Αθηναϊκα ιστορια, or Στοιχεια Αθηναιων). This took up the history of Greece where Thucydides breaks off, a.c. 411, and was probably the work which Theopompus claimed as being written by him in thirty-four books. The work consisted of twelve books, and many fragments are still preserved.

3. The history of Philip of Macedonia and his time (Φιλαδηφου ιστορια). A portion of this is extant, and elsewhere quoted. In this work, Theopompus, at least, was the first to observe that the accession of Philip, or more properly from the foundation of Philip, down to his death, five books of which were lost as early as the time of Diocletian Siculo (xvi. 3), and they were probably the same which Polybius (x. 137, p. 300) mentions as being lost in his time, viz. books 6, 7, 9, 20, and 30. This voluminous work not only embraced the history of Greece in the widest sense of the word within the period mentioned, but also treated of those earlier parts of Greek history and of the various nations as being mentioned in it. These things formed numerous and long digressions in the work, and on their extent we may judge from the fact that Philip III. of Macedonia, after cutting out these digressions, reduced the work from 160,000 words to 76,000. We have only a few fragments of the work, which the antient writers refer to and quote.

Besides these historical works, Theopompus wrote many others it is intimated, and he composed Panegyrics on Mausolus, Philip, and Alexander. As regards his character as an historian, the antients praise him as a lover of truth, but they also state that he was extravagantly severe in his censure, and unbounded in his praise. His ardent and vehement temper did not allow him to pre- serve that calmness which becomes the historian. He is also charged with having been too fond of the marvellous, and with having for this reason dwelt too much upon the mythical stories of Greece wherever he had occasion to do so. The fragments of Theopompus have been collected by Wicher: 'Theopomphi' Chii Fragmenta, collegit, dispositit, et explicavit, ejusdemque de Viris et Scriptis Commentariom praeomne.' &c. Longin Balatovum, 1823, 8vo. They are also contained in C. and J. Miller's 'Fragmenta Historiicorum Graecorum' (Paris, 1841), p. 278-333. Compare F. Koch, Prolegomena ad Theopompon Chii. Stettin, 1803, 4to. A. J. E. Pflugk, De Theopomphi Chii Fragmentis, 1805, 8vo. They may be modified very much at the will of the calculator, so as still to obtain the same mechanical results (in the manner in which the distribution of the fluid of light in crystallized bodies has been by those analysts who have developed the undulatory theory, and which seems preferable to the more long before the phenomena of crystallization, liquefaction, &c. is the hypothesis by which is explained, and the absence of all external action in solids, with the exception of gravitation. The difference of the calculations of Navier and
Poisson show how much this hypothesis may be adroitly stretched. A third method of viewing the phenomena of matter is more strictly inductive, and is similar to that employed in the investigation of the distribution of latent electricity, in Mr. Murphy's 'Treatise on Electricity,' &c. Here we start from the fact that the perfectly imper-}

fect solid is lying in the imperfect state of analytical calculation relative to definite integrals; nevertheless enough can be deduced to show the distribution of attractive and repulsive forces within the variously-formed bodies. In higher mathematics the analysis of a nature somewhat similar to that employed by Laplace on the figure of the earth and the tides.

The best test of the truth of any theory on this subject is that which, with the forces supposed to exist, shall show that the loci of the points of least resistance, commencing from a given point, shall be a plane surface, or several plane surfaces, as exhibited by crystals.

Dr. Young's 'Lectures on Natural Philosophy; Various Papers from the 'Transact. Royal Soc.' and Poisson's 'Traité sur l'Action Capillaire.'

THEORY, THEORY AND PRACTICE. It articles upon the mere meaning of words be admissible, it is the common manner in which words are used. Of the fallacies which infest society, the most common is that of applying to one sense of a word ideas or associations derived from another; and of all the words in use, there are few which are more often subjected to such purposes as the word 'theory,' and that of this article.

By theory, properly speaking, is meant the mode of making seen and known the dependence of truths upon one another: a theory is a connected body of such truths belonging to one or more common principles. The use of this word has been connected with the word 'interwoven', and that of theories with the word 'interwoven'; for example, before the discovery of universal gravitation, all that was known of any one planet was the empirical formula for one or two of its inequalities. This constituted the theory of the planet (then so called); thus the theory of the moon consisted in the statement of the laws of the inequalities called the equation of the centre, the eclec-}

tion, &c. In our day the point of view is changed; it is no longer the mere exhibition of these inequalities which constitutes a theory, but the deduction of them, as sciences, from the principles of gravitation. The theoretical astronomer now starts from this principle, and, taking only one position and velocity for his numerical data, he points out the inequality of the planetary motions, those which were previously known from observation are explained, and shows how to form them into tables. The practical astronomer makes these tables, computes places from them for the current year, compares these places with the results of observation, and returning the comparison into the hands of the theorist, enables him, if need be, to cor-}
rect the original numerical data to which he applied his methods. The process is now deductive; but before the time of Newton it was the other way. The observer had the first place; the inequalities were to be collected from comparison of observations, and their laws, reduced to their simplest form, were the data for future tables.

Again, before the introduction of the undulatory hypoth-

thesis, the theory of light consisted in the exhibition of the laws of reflection and refraction, with a certain extent of explanation from the epicyclic hypothesis of Newton. Since that time the theory of light has become, though at a distance, a resemblance of the theory of gravitation in its character: prediction has commenced, that is to say, the phenomena which would appear under certain new circumstances have been announced before any experiments were made to discover them; and correctly an-}

ounced. It is easy to end which is a distinctly tending; namely, the discovery of laws of action in so complete a manner that the necessary consequences of these laws never fail to make their appearance, so that every thing which is seen is found to be a consequence of the laws of action, and every law which is seen in phenomena when looked for. Whatever fulfills these conditions may be called a perfect theory, or a perfect mathematical theory.

The next step in the chain of discovery is one which may in most cases be incapable of attainment. For example, nothing is more certain than the assumption of every particle of matter attracting every other particle, according to the Newtonian law, leads to the complete destruction of the possibility of a complete solution of the problem of prediction just alluded to. But whether this attraction does actuate place, or whether any intermediate agent is employed, though it matters nothing in practice, to the mathematical theory, is the next object. But it is certain that this is a more rare case than that the knowledge of the constitution of matter to which it would lead, would open hundreds of important consequences even in the application of science to the arts (Cayley).

Before coming to the distinction between theory and practice, we must observe that theories may be divided into two classes, the more perfect and the less perfect. We cannot say that any theory is absolutely perfect; but there are some of which the defects are hardly perceptible, and others in which the contrary is the case. For example, the theory of the statics and dynamics of rigid bodies is toler-}

ably perfect; but that of bodies composed of particles acted on by molecular forces is in its infancy. We have a great advance in the first case of the correct analysis of the laws by which each with other, we do the particles which, was connected together, form a bar of iron or of oak. We know that the bar is not perfectly rigid; that it bends and swells and has an elasticity. The force of gravity is external because, and the amount of pressure necessary to produce fracture, must be sought for in experiments, from which, imperfect as they are, the laws which would flow from a good theory, if we had one, are to be deduced. In each subject, a good theory is one which can form a guide, is only a help, the services of which are to be used to an extent which discrimination derived from practice and experience must point out. Many a person who has acquired a great advantage, of the general knowledge of the process he uses, and of his history, may not be sufficient to inform him.

A person who uses an imperfect theory with the com-}

pletion due only to experience, must certainly mar the abundance of mistakes: his predictions will be crossed by disturbing circumstances of which his theory is not able to take account, and his credit will be lowered by the failure. And inasmuch as more theories are imperfect than are proper-}

ly correct, and that much of them, as sciences, require very sound habits of judgment is small compared with that of those who do not set far so much, it must have happened, and has happened, that a great quantity of mistakes have been made by those who do not understand the true use of the theory and its restrictions. This is brought upon theory in general; and the success of theoretical and practical men has arisen. Fortunately there are many of the former who attend properly to the improve-}

ment of imperfect theory by experience, and themselves practical who seize with avidity all that theor-}

can do for them, and who know that step by step theory has been making her way with giant strides into the voc-

try of practice for the last century and a half.

By practice, as distinguished from theory, is meant ex-}

perienced practice, by us, but by those who contend for the distinctive 'ap-}

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eral principles to be entitled to the name of a theory. The perfection of labourers in the mechanical arts, the progress of all which was introduced to the practice of the arts and sciences, the value of the observations of the knowledge of which is generally included in the word 'experience.'

The practical man, when he is really nothing more, as we who can just do what has been taught to do, and who has no right to claim skill and judgment in his ob-
}

servations. All who pride themselves upon the title will be pleased at this definition, and we readily admit that many of them are entitled to a higher character, but cannot be distinguished by which they delight to describe them-}
}

selves as a wrong one. They are generally a workman, to claim the qualities of a master. The term theoretical serves, as one of contempt, to designate any
thing of which they disapprove; and as there never is any
certainty of being right or wrong, except by the
lower order of users, it would not be difficult to make
of most amusing selection of instances of the manner
in which the distinction has been worked by the large number
who are at the bottom of the class, and in whose heads it runs
that their own ignorance is perfect, and other's knowledge
theoretical. We remember seeing a theorist, as he was called,
endeavouring to make the managers of a certain under-
taking comprehend that their profits could not exceed the
excess of the gross returns over the outlay, after they had been
made to observe that the returns were almost what they would have to have, but which the
theorist assured them they would not get, for the preceding
reason. The answer was, 'That is very true theoretically,
but now let us look at it practically.' We shall say no
more of the gross abuse of the terms, except to remark that
were it worth while really to make a contest between
theory and practice, it would be difficult to say on which
side the balance of absurdity would incline; or whether
the man who is too confident in his theory, or too con-
fident in his experience, has done most mischief for the
time being.

Coming now to the higher class of practical men, and
speaking as of the balance between two methods, the
value of which is the practical productivity. There are
obvious faults to which both parties are subject, both
in conduct, and in argument respecting their pursuits.
Great care is necessary to secure the theorist from pushing
an imperfect theory too far, and neglecting causes of disa-
ture: and on the other side, the practical man is apt to
make the practical man from generalising into theory from im-
perfect experience, or from restraining inquiry by a notion
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We have often been surprised at the boldness with which the
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Analogies are of all things the most deceptive.

In argument there is one mode which is common to
both parties, and which is exceedingly detrimental. It is
the selection of instances from the very highest minds of the
two systems, to illustrate the effects of theory or prac-
tice upon the general mass of understandings; minds the
superior calibre of which, and their power of adapting
themselves to circumstances, and making the most of
what they have, render them exceptions to all rules, and
no rule whatever: the difficulties of correct training.
Every one likes, no doubt, to draw consequences about
and concerning his own self from a contemplation of
the minds and methods of the Newtons or the Galileos
of his own age; and the theory has raised the names of
Watt or Telfords of a better state of power of adaptation.

What is your theory good for? says the tongue attached
to some head which holds about the same weight of
corvet that Telford's did of sagacity; 'Telford knew no-
thing of that, and I may do without it too.' The answer is,
Telford. The opinion of Bacon was, that 'the root of all
the mischief in the sciences is, that, falsely magnifying
and oversizing the powers of the mind, we seek not its real
helps, a maxim full of meaning, and a lesson to him who
wants still to appeal to a higher. And also to the one who
thinks that the only use of his mind is to arrange the
results of experience, his own or others. What are the
majority of men, that they should look down upon any
course of training, theoretical or practical?

To be but little practical, and at the same time but
al almost peculiar to the practical world, who have the force of numbers on their
own side, is the habit of claiming all who are success-
ful in application as instances of their own method
and of their theory. He should discover a mine, work it with his own hand,
purify the ore, and beat the metal into a horse-shoe; which he, a geologist, miner, furnace-man, or black-
smith? He has done the work of all, but the community
of his kind is apt to claim the work of the industrial man, and it will be always found that a well-established theory, fifty
years old, is practical knowledge, so called. To this there
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the investigation is more recent, and the completeness not so well ascertained. But when the question is theory, as when the advocates of the latter frequently find it convenient to assume, for their own share of the matters in contest, all the best theories plus the most recent practical knowledge, leaving to the other side the onus of supporting theory upon the most imperfect part of the doctrine which it contains, being the part which is not yet off the anvil. Suppose a merchant going into the bail court to prove his being worth a certain sum; he is asked whether his business, all debts and risks allowed for, could produce that sum: he replies, that his ventures must be beyond, and without much demonstration, with a view to draw the attention of those who have learned the doctrine of equilibrium in the 2o way: we cannot make it intelligible (without too great length) except to those who have learned the principles of mechanics.

M. Poinsot called a pair of equal and opposite forces, not equilibrating each other, by the name of a couple. Here general terms, however, by it is to be understood a couple which cannot be made anything but the first cannot be replaced by one force: an incomparable couple. The plane of the couple is the place drawn through the parallel forces: the arm of the couple is any line drawn perpendicular to the forces from the direction of one of the other: the arm is any straight line perpendicular to its plane. And if we consider an axis, it will be apparent that the moment of the couple is represented by the product of one of the forces by the moment of one of the others, a being the arm of the couple. Hence if P one of the forces, the unified leverage is P(r±d)−P.r or ±P.r. This product is just equal to the moment of the couple.

The last-mentioned property will give a high probability to itself to the following theorems, which are the basis of the theory of couples, and can be proved, the first by use of the composition of forces only, the second by the principle of the lever. 1. If the arm of a couple be replaced by another of the same moment, the plane and direction of turning remaining unaltered; that is, the arm may be shortened or lengthened in any manner, provided the forces be increased or diminished in the same proportion. If the moments were in equilibrium, however its couples may be altered, in any manner described in the above theorems. Hence it follows that a couple is entirely given when there are given:--1. A couple. 2. Any moment of one of the forces, and the radius perpendicular to any of the planes into which it was removed. 2. The moment of the couple; specific forces or arms are unnecessary for its description, so long as the product is given. 3. The direction in which it tends to turn the system. These last two are then as follows; suppose for example a horizontal or Take any vertical line for the axis of the couple, at this (axis) lay down a line proportional to its moment, and agree that vertical lines drawn upwards shall represent moments tending to turn the system from west to east and downwards, those tending to turn the system from east to west. But a sign must also be agreed upon; positive moment must con- in tendency to turn in one direction and negative in the other.

The composition and resolution of couples is each shown to be done in a manner which perfectly confirms that of Rotations. When the couples can have a common axis (act in the same plane or parallel planes), the moment of the resultant is, in sign and magnitude, the sum of the moments of the components, with their proper signs. To find the resultant of two couples which cannot act a common axis, take axes to them which pass three the same point, and on these axes lay down lines proportional to the moments of the components in both directions. On these lines complete a parallelogram: the direction of the diagonal is the axis of the resultant couple, and its length represents the moment of the couple. Care must be taken to lay down the directions of the forces properly on the parallelogram rule (when reference is not made to distinct couples) planes is as follows: let the parts of the plane of the of which lie in the angle made by the lines representing moments be turned by the two couples in opposite directions.
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To the student to whom such a direction would be useful we should say, appeal in all cases to the perceptions derived from Rotation.

To apply the preceding theorems to the states of a rigid body, we first take the following conventions:—Assume an origin and three rectangular axes of co-ordinates, as usual. Let the forces which act at each point of the system be decomposed into three, parallel to the axes of $x$, $y$, and $z$. Let each force be positive, when it acts towards the positive part of the axis to which it is parallel; if for instance the axis of $x$ be vertical, and if its positive part tend upwards, all forces in the direction of $x$, wherever they act, are called positive while they act upwards, and negative when downwards. As to couples, let their moments be called positive when, acting in the planes of $x$ and $y$, $x$ and $z$, or $y$ and $z$, they tend to turn the positive part of the first-named towards the positive part of the second ($-xy, yz, zz$). Let $P$, be the first point of the system; let its co-ordinates be $x, y, z$; let the forces in the three directions acting at that point be $X, Y, Z$. Let $P$, be the second point; $x', y', z'$ its co-ordinates; $X', Y', Z'$ the forces there applied: and so on. All co-ordinates and forces have their proper signs. At the origin the following pairs of equilibrating forces, $X, -X$, and $-S$, $Y$, and $Z$, $-Z$, and $Z, -Z$, and $x, x'$, and $Z, Z'$, $x$ and $z$, all of which of course do not affect the equilibrium, and are over and above those already applied.

Again, at the extremity of $x$, in the direction of $x$, apply the equilibrating forces $X, -X$; at the extremity of $y$, in the direction of $y$, apply $Y, -Y$; and at the extremity of $z$, in the direction of $z$, apply $Z, -Z$, and so on for the other points. Lastly, let the points of application of the original forces $X, Y, Z$, be changed so that each shall act at the projection of the point of application made by its co-ordinate: and the same for the other points. Nothing is done but the application of mutually destroying forces, or the change of the point of application of a force to another point in its direction, and the following figure will show the present arrangement for one point. The original forces, transferred, are marked $X, Y, Z$, the original point of application $P$, and the other forces, equilibrating two and two, have great and small letters at their extremities.

We now see that the forces $X, Y, Z$ are equivalent to
1. The forces $X, Y, Z$ (marked $A, B, C$) applied at the origin.
2. A pair of couples to the axis of $z$ ($l, b$) $(X, n)$, the first positive with the moment $Yx$, the second negative with the moment $-Xy$; the two are equivalent to one with the moment $X-XY$.
3. A pair of couples to the axis of $x$ $(M, c)$ $(Y, l)$, the total moment of which is $Yz - Yz$.
4. A pair of couples to the axis of $y$ $(N, a)$ $(Z, m)$; the total moment of which is $Xz - Zz$.

Apply this to every point in the system, and let $XZ$ stand for $X+X+X+\ldots$, and so on; hence it appears that the whole of the forces are equivalent to forces $XZ, YZ, ZZ$, applied at the origin in the directions of $x, y, z$, and together with couples in the planes of $xy, yz, zx$, of which the moments are—

$$\Sigma(2XZ - YZ, ZY - XZ, XZ - ZZ).$$

Now, $A=2X_1, Z=2Z_1, XZ$,


Then it appears that all the forces can be reduced to one force, $V$, acting at the origin, making angles with the axes whose cosines are $A: V, B: V, C: V$; and one couple having a moment $W$, and whose axes make with the axes of $V$ the same angles as the cosines of $W, M, N, W$. But when there is equilibrium, both the force and the moment of the couple must vanish, for the single force cannot equilibrate a couple. Consequently the conditions of the equilibrium are $A = 0, B = 0, C = 0, L = 0, M = 0, N = 0$, the six well-known conditions of equilibrium.

The forces will have a single resultant when $V$ falls in the plane of the couple whose moment is $W$; that is, when the direction of $V$ is at right angles to the axis of the couple. This takes place when $A + B + C = 0$, a well-known condition.

For further information we may refer to Poinsot's Eléments de Statique; or, in English, to Pratt's Mathematical Principles of Natural Philosophy; or Pritchard's Theory of Couple.

THEORY OF EQUATIONS. Under this term is expressed all that part of algebra which treats of the properties of rational and integral functions of a single variable, as $ax + b$, $ax^2 + bx + c$, $ax^3 + bx^2 + cx + d$, &c., being any algebraic quantities, positive or negative, whole or fractional, real or imaginary. Unless however the contrary be specified, it is usual to suppose them entire.

The great question of the earlier algebraists was the finding of a value for the variable which should make the expression given a certain number of fraction: as what must $x$ be so that $2x + 2x$ may be 11, or $x^2 - x + 6$ may be 0, and so on. The second was also asked what value of $x$ will make $3x + 2x - 11 = 0, or x^2 - x^4 - 6x + 1 = 0$, and so on. To find values of a variable which should make an expression vanish, or become equal to nothing, was then the first desideratum; and these values are now called roots of the equation, and they have made the finding of these roots subservient to the discovery of other properties of the expressions.

The Hindus algebraists communicated to the Arabs, and through them to the Italians, the complete science of equations of the first and second degrees. The Italians added the solution of equations of the third degree, and of the fourth imperfectly. These last two degrees have been completed in more recent times, so that it may be now said that the solution of the first four degrees has been completely conquered: that is to say, having given the equation $ax^2 + bx + c + dx + e = 0$, an algebraical expression can be found, having four values, and four values only, and being a function of $a, b, c, e, f$, which being substituted for $x$ in the first side of the given equation, make that first side vanish. But the student would look in vain through the books of algebra to see this expression; it is both complicated and useless, and it is more desirable to indicate how it is to be found, than to find it. The equation of the fifth degree was attempted in all quarters, without success: means were found of approximating to the arithmetical value of one or another root in any one given equation; but never a definite function of the co-efficient of which would apply in all cases. A proof was given by Abel in Crelle's Journal (reprinted in his works), that such an expression was impossible, but this proof was not generally received: it was admitted by Sir W. Hamilton, who illustrated the argument at great length in the Transactions of the Royal Irish Academy, volume xviii., part ii.; but the singular complexity of the reasoning will probably prevent most persons from attending to the subject. We do not mean in this article to enter into the history of the theory of equations, but only to place it on a general system, being regarded merely as a theory of the principal theorems, mostly without proof. For works on the subject we may refer as follows:—Hutton, Tracts, vol. ii., Tract 33, which contains a full account of the earlier algebraists; Petavius's report on the Transactions of the British Association; or the recent works of Murphy, Young, or Hymer; all of which are good, and written on such different plans that any one who makes a particular study of the subject will find it advantageous to consult them all. In French the standard works are those of Budan, Lagrange, and Fourier, which however all treat of particular topics; the

$$V = \sqrt{(A^2 + B + C^2)}, W = \sqrt{(L + M^2 + N^2)}.$$
algebraical treatises of Bourdon and Lefèvre de Fourey take it more generally.

The particular points relative to equations of the first four degrees are as follows:

1. The expression of the first degree can be reduced to the form $ax+b$; it vanishes when $x=-b/a$, and has only this one root. And $ax+b$ is of the same sign as $a$ or not, according as $x$ is greater or less than $-b/a$.

2. The expression of the second degree is more important; it can always be reduced to the form $ax^2+bx+c$, and its properties are best developed by transforming the preceding into

$$(2ax+b)^2-4ac-b^2$$

and has always the same sign as $a$, except when $x$ lies between those roots. Every change of signs in passing from $a$ to $b$ and from $b$ to $c$ indicates a positive root, and every continuation on $a$ indicates a root. When one root is positive and one root negative, the positive or negative root is numerically the greater, according as $(a, b)$ shows a change or continuation. When $x=a-2b$, the expression is at a maximum. The variation between the two roots, its value in $(2ac-b^2)/4a$.

When $b=4ac$, the expression $ax^2+bx+c$ is a perfect square with respect to $x$, and absolutely so if it be a square. The two roots become equal, and each equal to $-b/2a$. The expression now never differs in sign from $a$.

When $b<4ac$, the two roots become imaginary, the expression always has the sign of $a$, and is numerically least when $x=a-2b$, being then $(4ac-b^2)/4a$.

3. The equation of the third degree (or cubic) has been separately treated in the Articulæ Mathematicæ, Case 4.

Nothing belongs particularly to the equation of the fourth degree (or biquadratic) except the reciprocal of the various modes in which the solution is reduced to that of a cubic. The various modes are distinguished by the names of their inventors.

Ferrari. Let $x^4+ax^2+bx+c=0$. This can be transformed into

$$(x^2+e)^2=(2a-e)x^2-6ax+c-e$$

make the second side a perfect square; that is, find $r$ from $b'=(2a-e)^2 - 4a(b-e)/2a$, or $8a^2-4a(e-2b)+4a+4ac-b^2=0$; the extraction of the square root then reduces the biquadratic to a couple of quadratics.

Let $x^2+ax+bx+c=(x^2+ap, x+f)$, where $g+f-p=a$, and $f^2+ap-b^2=0$, and find a positive root of this equation (it certainly one), and then $x=(x^2+ap, x+f)/2a$, or $x^2+ap, x+f=0$, and $x^2+x+f=0$, are those of the given equation.

Thomas Simpson gave a modification of Ferrari's method, and Euler one of that of Descartes, (Murphy's Theory of Equations (L. U. K.), pp. 54, 55.)

The theory of equations of all degrees is to be divided into two distinct parts: the numerical solution, and the general properties of the roots and the expressions themselves.

The general solution must be carefully distinguished from the general solution; the former term applying to any mode of approximating to a single root, the latter to any mode of extracting a general expression for the roots. We shall begin by the general properties of the roots and the expression given in being $\phi_2$, or $a_2x^s+a_1x^{s-1}+\ldots+a_0$.
THE extended algebra, $Z = x + y \sqrt{-1}$. Again, let $\mu$ and $\nu$ be the co-ordinates of the radical point, and $A$ its radius vector; so that $A = \mu + \nu \sqrt{-1}$. Let $R$ be the radius drawn from the radical point to the contour, so that $E = A + R$. $R$ is the infinite equation, $\phi = 0$; let there be $m$ equal roots belonging to the radical point ($m$ being 1, or some other integer): then will $\phi (A + R)$ be capable of expansion into the form $B^m - B^{m-1} + \ldots + B - 1$, of which, $R$ being infinitely small, only the first term need be considered. Now let $B$ and $R$ (taking the most general forms) be $b (\cos \beta + \sin \beta \sqrt{-1})$ and $r (\cos \rho + \sin \rho \sqrt{-1})$, whence $Br^m$ will be $br^m \cos (m \beta \rho) + \sin (m \beta + \rho)$, and $P, Q$ will be cot $(m \beta + \rho)$, its remaining terms being infinitely small. Let $R$ make a complete circuit, or let $r$ increase from 0 to $2\pi$, whence $m \beta + \rho$ will go $m$ times through four right angles. In each revolution cot $(m \beta + \rho)$ will change from $+1$ to $-1$, and from $-1$ to $+1$, passing through nothing: but never from $-1$ to $+1$ except by passing through infinity. The theorem is then true: for $k = 2n$, $l = 0$, $\frac{1}{2} (k-l) = n$, and there are $m$ radical points (or one radical point belonging to an equal root with its negative). The theorem is then true for every infinitely small contour. Next, let the whole contour ABCD be divided into an infinite number of infinitely small figures, with no other limitation than that no radical point is to fall upon one of the lines of division. Let a point move through each of the infinitely small figures in the positive direction of revolution. It is clear that the expression $\int_{2\pi} + \ldots - \frac{1}{2} + \ldots - \frac{1}{2}$ will not be altered if we remove all the internal division lines and leave only the external contour ABCD: for each internal line is described by two points moving in opposite directions, and wherever one point adds a unit to $2\pi$, the other adds one to $-2\pi$. Hence the value of $2\pi - 2\pi$ can be found by finding that of $k - l$ for the boundary only: and the theorem is proved.

1. If $\phi = AZ^2 + A^2z^{-1} - \ldots$ and we make a contour in question a circle with the origin as a centre, and a radius so great that the highest term $AZ^2$ need be the only one retained, we can immediately prove that $\phi z$ has neither more nor less than $r$ roots. For, $Z$ being $z (\cos \zeta + \sin \zeta \sqrt{-1})$ and $A$ being $a (\cos \alpha + \sin \alpha \sqrt{-1})$, let us ascertain, as before, that $P, Q$, or all of it that need be considered, is cot $(n\alpha + \zeta)$, whence $k = 2n, l = 0$, and $\frac{1}{2} (k-l) = n$.

4. We may now refer to Sturm's Theorem, to Fourier's theorem (given in the article just cited), to Des Cartes' theorem, a very limited particular case of Fourier's, and to Horner's adaptation of, and addition to, the old method of numerical solution by Vieta (an account of the history of this last problem, and its place in the "Complete Almanac" for 1839). We have thus, since the beginning of this century, a complete mathematical theory of determining the number of roots, real or imaginary, between any given limits; both exceedingly difficult in the complication of the operations which they require. Also, a most of easy application, though not theoretically perfect, of determining the limits between which the real roots lie; and a process for the numerical solution which places that question upon the same footing as the common extraction of square, cube, &c. unlike signs by themselves, except only in the case of the square root, much easier than before.

3. The Newtonian method of approximation is in the following theorem. If $a$ be nearly a root of $\phi = 0$, and if $\phi a, \phi^2a$ be small, then

$$a = \frac{\phi_a}{\phi^2_a}$$

is more nearly a root. See Approximation for the use of this, and Taylor's Theorem, p. 129, for a more extensive result. But the use of Horner's method is very much more easy than that of Newton: the former, in fact, includes and systematizes the latter. But this remark applies only to algebraical equations; for all others Newton's form just given remains practically unamended.

6. We refer to the article Root for the solution of

$$x^2 + 1 = 0.$$ The following equation, $x^2 \pm 2 \cos \theta \cdot x^2$$+ 1 = 0$, admits of complete solution on the same principles.

7. If $\phi a$ and $\phi b$ have different signs, or one or some other odd number of roots of $\phi x$ lies between $a$ and $b$: but if they have the same signs, either no one or an even number of roots of $\phi x$ lies between $a$ and $b$. Every equation of an even degree has at least one real root, negative or positive, according as the first and last terms have like or unlike signs. Every equation of an even degree having the first and last terms of like signs has at least two real roots, one positive and one negative.

8. If all the coefficients of $\phi x$ be real, and one of the two, $a + b$, $a - b$, be a root, so is the other: and if all the coefficients be rational, and one of the two, $a + b, a - b$, being rational, be a root, so is the other. If there be a rational fractional root, its denominator must be a divisor of the first coefficient, and its numerator the last, as soon as the equation $\phi x = 0$ is cleared of fractions. N.B. Among the divisors we reckon 1 and itself.

9. In the equation $a_0 x^n + a_1 x^{n-1} + a_2 x^{n-2} + \ldots + a_n = 0$, the sum of all the roots is $a_0 : a_1$, the sum of the products of every two is $a_2 : a_1$, the sum of the products of every three is $-a_3 : a_1$, and so on. Finally, the product of all the roots is $a_{n-1} : a_1$, according as $n$ is even or odd. And if $r_1, r_2, \ldots, r_n$ be the roots, then $a_0 x^n + \ldots$ is the same as $a_n (x - r_1)(x - r_2) \ldots (x - r_n)$.

10. If the preceding expression be called $\phi x$, and $m a_0 x^n + (n + 1) a_1 x^{n-1} + \ldots$, its derived function, be called $\phi x'$, we have

$$\phi'\frac{x}{x} = \frac{1}{x - r_1} + \frac{1}{x - r_2} + \ldots + \frac{1}{x - r_n}$$

and if $\phi$ be any rational and integral algebraical function of $x$, the sum $\phi'\frac{1}{x} + \phi'\frac{1}{x} + \ldots + \phi'\frac{1}{x}$ is the coefficient of the highest power of $x$ in the remainder of the division of $\phi x' \times x$ by $\phi x$.

11. If $S_m$ in all cases stand for the sum of the nth powers of the roots of the equation, we have $S_m = n, a_0, a_1, \ldots, a_n$, $a_0 S_m + a_1 S_{m-1} + a_2 S_{m-2} + \ldots = 0$, $a_0 S_{m-1} + a_1 S_{m-2} + a_2 S_{m-3} + \ldots = 0$, and so on up to $a_0 S_0 + a_1 S_{-1} + a_2 S_{-2} + \ldots + a_n S_{-n}$.

12. All rational symmetrical functions of the roots may be easily expressed in terms of $S_m, S_{m-1}, \ldots$. and thence in terms of the coefficients of the equation.

13. If it be required to find a function $\phi y$ of the roots of which shall be given functions of those of $\phi x$, so that in all cases $y = \frac{1}{x}$, proceed as in finding the highest common divisor of $\phi x$ and $\phi y$, and take for $\phi y$ the final remainder. But if this final remainder should be of a higher dimension than, from the known number of its roots, it ought to be, it will be a sign that some of the factors introduced in the process have affected the remainder, and these must be examined and removed. The treatment of this case belongs to the general question of elimination, but the following particular cases are almost all that are necessary.

14. To determine the roots of $\phi x$ by a given quantity, or to make $y = x - a$, observe that the resulting equation must be $\phi x + a \phi' a + y \frac{\phi'' a}{2} y + \frac{\phi'^2 a}{2} + 2 \frac{\phi a}{a} y = 0$, where the coefficients $\phi a, \phi' a, \frac{\phi'' a}{2}, \frac{\phi'^2 a}{2}, \frac{\phi a}{a}$ may be most readily found by the process described in Involution (p. 7). The same process may be applied, by using $-a$ instead of $a$, to increase all the roots of $\phi x$ by a given quantity. It is by this process the second term of an equation is taken away: thus, the equation being $a_0 x^n + a_1 x^{n-1} + \ldots = 0$, assume $y = x + \frac{1}{a}$. Thus,
the sum of the roots of the equation in $x$ being $-a_1$ $a$, that of the equation in $y$ will be $0$.

15. To multiply all the roots of an equation by a, multiply its successive terms, beginning from the highest, by $1$, $m$, $m^2$, $m^3$, etc. And to divide all the roots of an equation by $m$, multiply all the terms by $1$, $m^{-1}$, $m^{-2}$, etc., beginning from the lowest. N.B. Terms apparently missing in the equation must never be neglected. Thus $x^3-2x^2+3x-1=0$ ought to be written

$$x^3+0+0-2x^2+0+0+3x+0-1=0.$$  

This caution is of the utmost importance: in fact, no process ought to be applied to any equation without a moment's thought as to whether all the terms are formally written down, and if not, whether the process about to be applied will not require it.

16. To change the signs of all the roots of an equation, change the signs of the coefficients of all the odd powers, or all the even powers, as most convenient.

17. To change an equation into another whose roots shall be reciprocals of the former roots, for every power of $x$ write its complement to the highest dimension. Thus in an equation of the seventh degree, for $x$ write $x^6$; for $x^2$ write $x^5$; and so on; lastly, for $x^2$ write $x^6$. N.B. Consider the independent term of the equation as affected by $x^0$. From the reciprocal equation can be found the sums of the negative powers of the roots of the original.

18. The old methods of finding limits to the magnitude of the positive and negative roots of an equation are so rapid that they can hardly be said to be superseded by those of Sturm or Pu
er. In enumerating them we shall not refer to any of them absolutely, for the sake of mentioning any increase or decrease they are to receive.

A be the greatest of all the quotients made by dividing the co-efficients by the first co-efficient, no root, positive or negative, is numerically so great as $A+1$. And if $B$ be the greatest of all the quotients made by dividing the co-efficients by the last co-efficient, no root, positive or negative, is numerically so small as $1/(B+1)$. Better thus: if $L$ be the first co-efficient, $M$ the greatest, and $N$ the last, signs not considered, then all the roots, numerically speaking, lie between

$$M+L \quad \text{and} \quad M+N$$

19. If $L$ be the first co-efficient, and $M$ the greatest co-efficient which has a different sign from that of $L$, no root is so great as $M+L$: $L$. And if $L$ be the last co-efficient, and $M$ the greatest co-efficient which has a different sign, it is $M+L$: $L$. And to apply this to the negative roots, change the signs of all the roots of the original (§ 16), and find limits to the positive roots of the new one.

20. If $L$ be the first co-efficient, $M$ the greatest which has a different sign, and if the first which has a different sign be in the $n$th place from the first term exclusive, or belong to the $(m+1)$th term; then no positive root is so great as

$$\sqrt[1-n]{\frac{M}{L}}.$$  

21. If each co-efficient which differs in sign from the first term, be divided by the sum of all which precede and agree with the first term (the first term itself included), the greatest resulting fraction, increased by unity, is greater than any positive root of the equation.

22. Newton's method of finding a limit greater than the greatest positive root of any equation now moves in Fourier's theorem. It consists in finding $r$ by inspection and trial, so that $a_r, a_r', a_r''$, shall be all positive. Apply it to the reciprocal equation (§ 17), and the reciprocal of the result attained is less than the least positive root of the original. Apply both to the equation of roots with signs changed, and the results give limits for the negative roots of the original.

23. A calculated mode of examining the roots of equations, but too complicated for ordinary use, consists in forming the equation whose roots are the squares of the differences of the roots of the original. Any quantity being found less than the least positive root of this new equation, its square root is less than the difference of any two roots of the original. If such a quantity could be readily found, the theoretical perfection of Fourier's theorem would be greatly diminished, and, practically speaking, much advantage would be gained in numerical solution. When wanted to add to both Fourier's and Horner's method a ready mode of finding out when two roots are equal.

24. Lagrange's mode of approximation is as follows: Having found that a root of an equation lies between the integers $a$ and $a+1$, diminish all the roots of the equation by $a$, and take the reciprocal equation to the result. Find a root of the last lying between the integers $b$ and $b+1$, diminish all the roots by $b$, and take the reciprocal equation of the result. Find a root of this last between $c$ and $c+1$, and proceed in the same way. Then the continued fraction

$$\frac{1}{a+\frac{1}{b+\frac{1}{c+\ddots}}}$$  

is a root of the original.

25. When an equation has equal roots, those roots are found by an equation depending entirely on the different sets of equal roots. If $ax$ has $m$ roots equal $a$, $y$ has $m-1$ of them, $x'$ has $m-2$ of them, etc. And finally, $x-y-a$ has one of them. If then $x-y-a$ is found to have a common measure, every root of the reciprocal equation or of any other to it, is the common measure itself.

26. When an equation has an integral root, which must be one of the divisors of the last co-efficient, it may be covered by successive trial, as follows. Suppose $x^p+y^p+z^p=0$, and it is necessary to find a divisor of $a$, and let $a=k$, an integer. Let $x=1$, a root, we have $a^p+y^p+z^p=0$, and $x+y+z$ divisible by $k$, giving $m$, an integer. Hence $x^p+y^p+z^p=0$, and $x+y+z$ divided by $k$ gives $m$. Hence $a^p+b^p+c^p=0$, and $a+b+c$ divided by $k$ gives $m$. If all these conditions be fulfilled, $k$ is a root. All divisors of $a$ being tried in this manner, set down the greatest of the integral roots entirely.

27. If the co-efficients of an equation read back-wards and forwards the same, both in sign and magnitude, the root has its reciprocal also among the roots. By reducing it to the form

$$px+q\left(x+\frac{1}{x}\right)+r\left(x+\frac{1}{x}\right)^2+\ldots+0,$$

which can always be done by division, when the division is even, and assuming $y=x+\frac{1}{x}$, an equation of the 2nd degree can be reduced to some of the $n$ quadratics. But when the dimension is odd, either $x$ or $\frac{1}{x}$ must be a root, and the equation can be reduced to an even degree by division of $x\alpha$.

28. The student who is acquainted with the preceding results, namely, such as are either stated or referred to in this article, will find no difficulty either in reading or writing of equations, in appli- cation, or in his Travels in the Literary world.

THEIRA (island), an island in the Grecian Archipelago, and the chief of the group known by the name of Sporades, although called by some authors writers one of the Clades. Its modern name is Santa Thras, which is pronounced and usually written Santorini. It is east of the island of Samos, x., Sarenna, is to be 200 stadia in circumference. It is an island of modern travellers thirty-six miles, and in a perfectly exact line, like a horsehoe. It is opposite the island of Dia, and distant from Crete 700 stades, and from the island of Tes, which lay to the north of it, 25 Roman miles. (Pliny, Hist. Nat., i., 23.) When it first entered upon the sea, it was called Cuellera. Thras was a small island to the west, and called present the same name, was torn away from it, according to P. Pliny's action seems at one time to have been set at work in this part of the sea. Saron. i., 57. which on one occasion flew between Therasia and Theran, which lasted for years, and that an island was formed in consequence, to lie stadia in circumference. The same phenomenon has taken place in modern times, and is particularly de- scribed by J. Thron. In his Travels in the Levant, Saron. Pliny also speaks of an island which arose between Tero-
and Therasis, to which he gives the names of Hieria and Autonoe, and of another which appeared in his own age, called This. This was the assembly called Aspomnion, or the white island; the latter Kaimeni, or the burnt.

Thera was originally inhabited by the Phoenicians, who are said to have been left there by Cadmus. It was subsequently colonized by Thera with a mixed colony of Minyans and Spartans (Herod. iv. 147, 148), and always remained faithful to its mother-city Sparta. This island and Melos were the only islands of the Cyclades that remained faithful to Sparta at the beginning of the Peloponnesian War. But Thera has acquired its chief importance from having founded Cyrene in Africa, under the guidance of Battus, in B.C. 631. (Herod. iv. 150, Sc.)

The Dorian dialect was spoken at Thera, as we learn from inscriptions, and the government of the island is said to be ruled by descendants of Minyans and Spartans, who first settled there. We find mention in inscriptions of a senate and a popular assembly.

Coins of Thera are extant belonging both to the time of its independence, and to the Roman Empire. Those of the former kind bear the letters ΘΘ, with the head of a youth on one side and three dolphins on the other.

In the present day the island is covered with pumice-stones; and though the soil is dry and barren, it produces a large quantity of cotton and wine. The wine is strong, and is exported to all parts of the Archipelago. There is no wood in the island; and as it has to be imported, and is dear, the inhabitants hardly ever have new bread, but eat biscuits, which are baked in the eaves of the houses, only three or four times a year. They have hardly any cattle, and very little fruit except grapes, and there is only one spring in the island. It contains a few castles, surrounding the whole of the inhabited part, and the inhabitants live underground in caves cut out of the porphyry, which are arched over with very light stones of a reddish colour. The island has a very desolate appearance, the coast being craggy and rugged, and the rocks burn and the sea deep. The haven is of the shape of a half-moon; but no ship can anchor in it, as no bottom has yet been found by the plumber.

In the beginning of the eleventh century, when Tournefort visited the island, there were 10,000 inhabitants, and a considerable number of Frenchmen, who lived in the Latin church. About two-thirds of the inhabitants belonged to the Greek church. (Tournefort, Voyage into the Levant, vol. i. p. 302, Sc.)

THE MENE (Μένη) was a native of Ceos, and the adopted son of the Spartan king Lycurgus, and an Athenian. He acted a very prominent part about the close and after the end of the Peloponnesian war. He first appears in the history of Greece as taking a part in public affairs in B.C. 421, as being foreman of the Ephor, Phrynichus, and Pisander, he endeavoured to upset the democratic constitution of Athens. In B.C. 410 he took part with Thrasybulus in the battle of Cyzicus, and in B.C. 406, in the celebrated battle of Arginusae. On this occasion, on which the Athenians gained a glorious victory, many lives were lost in the wrecks of their ships, which it was thought might have been saved if proper care had been taken. Theramenes and Thrasybulus had been commissioned by the Athenian generals to take care of the wrecks and to save as many lives as possible. In accomplishing this object, the generals in their dispatch to Athens concealed the commission they had given to Theramenes and his colleague, as it was clear that the latter would be severely punished for their apparent neglect. After the return of the fleet, the generals found themselves summoned to return to Athens, and in self-defence they were compelled to give an accurate account of the occurrence, and the more so as they had reason to believe that Theramenes would be punished for the supposed negligence of the people against them. That their suspicion was unfounded became evident afterwards, for when six of the generals were actually brought to trial, Theramenes was found guilty enough to appear foremost among their accusers. The generals defended themselves, and the late hour of the day rendering it impossible to take the votes of the assembly, the business was adjourned to another day. During the interval, Theramenes and the other enemies of the generals exorted themselves to excite the indignation of the people. On the day appointed for the next meeting a number of persons hired by Theramenes appeared in the assembly crying out, to raise the sympathy of the people for the loss of their friends, and to excite them against the alleged authors of their misfortune. After various debates eight of the generals were condemned to death, and six of them, who were present at Athens, were executed immediately. The blame of this act of cruelty falls mainly upon Theramenes, and he had taken advantage of the uncommon forbearance and candour of his victims, and of his own reputation, which had never before been stained by any atrocious crime, to effect their destruction.

Soon after the execution of the generals, the eyes of the Athenians were opened, it is said, by Thrasybulus, to their innocence, and it was decided that those who had misled them should be proceeded against, and that they should give security for their appearance at the trial. Theramenes, however, either by his skill or by accident, not only avoided the prosecution, but retained his place in the popular favour. In the following year (B.C. 405), shortly after the death of Pausanius, when an Athenian embassy had been rejected by the Spartan envoys, Theramenes, who, though he belonged to the oligarchical party, yet kept up the appearance of a friend of the people, offered to go as ambassador to Lysander, who had been destined to block the way of the Athenians, and to be resolved to have the Athenians promise to procure favourable terms, if the people would trust him. The majority readily acceded to his proposal, and he went to the camp of Lysander. Here he stayed for upwards of three months, hoping that in the mean time the city might be reduced. When he returned to the city, he declared that he had been defeated by Lysander, who himself had no power to decide upon the terms of peace with Athens, and that at last he had been directed by Lysander to the Lacedaemonian general to apply to the government, and to say that the Athenians had been sent by the inhabitants of Athens, and invested with full power to negotiate peace on any terms. Deputies of the Spartan allies met the ambassadors, and several of them insisted upon the total destruction of Athens; but the Spartans, with an air of suspicion, declared that the terms of peace were conditioned on the condition that the long walls and the fortifications of Piraeus should be demolished, that all ships of war with the exception of twelve should be delivered up to them, and that Athens should join the Peloponnesian confederacy, and follow her example, and upon that condition the long-continued war was at last to be brought to an end. Theramenes and his colleagues returned to Athens with these tidings, the famine had reached its height, but there were still some who refused to submit to the humiliation. Theramenes, anxious to get rid of these few before the report was brought before the assembly, gained over a man of the name of Agoras to bring accusations against them and get them all arrested. The plan succeeded, and the assembly was held in the theatre of Piraeus, where Theramenes urged the necessity of concluding peace on the terms proposed. Notwithstanding the opposition of some citizens to the treaty, and the taunts of others, who saw through the plans of Theramenes, peace was ratified, and Lysander entered Piraeus, (Lyca. 274.)

After the withdrawal of the Spartan general from Athens, Theramenes, Critias, and their associates, who had assumed the supreme power, wishing to upset the democratic constitution, but to maintain some appearance of decency, invited Lysander to attend the assembly in which alterations in the Attic constitution were to be discussed. Theramenes undertook the management of the business, and proposed that the supreme authority should be placed in the hands of ten persons, and that the spoils of war should draw up a new code of laws. The presence of Lysander and the neighbourhood of the Peloponnesian troops overawed all attempts of the friends of the people to maintain their constitution, and the proposal of Theramenes was adopted. Theramenes did not live to see the Thirty, and he nominated ten of the others. The outrages and atrocities committed by these Thirty spread general alarm in Attica, and the future was looked to with fearful apprehensions. Theramenes, perceiving the state of feel-
ing at Athens, reconnoitred with Critias, the most cruel among his colleagues. This was not from a feeling of humanity, but simply because he saw that the measures of the Thirty would ruin them. Critias was unconcerned about all consequences, and Theramenes gave way. Repeatedly Theramenes on his part protest; in the end he should betray them and join the popular party, for he was notorious for his political inconstancy, from which he is said to have received the nickname of the What (the shoe which fits either foot). At the same time the Thirty before the time had elapsed yet, to strengthen themselves they made out a list of 3000 Athenians on whom a kind of franchise was conferred, while all the remaining Athenians were treated as outlaws. This was dissatisfied with these proceedings but the tyrants insisted upon disarming the Athenians, with the exception of the three thousand and the knights. The reckless cruelty and avarice of the Thirty grew worse every day, and it was determined that each of them should select out one rich alien who was to be put to death, and whose property should be taken by his murderer. Theramenes refused to have any share in this crime. This refusal increased the fears of his colleagues, and excited their hatred against him, and they resolved to seize him before he could be chased from the town by his enemies. An accusation was brought against him in the name of the Thirty by Critias before the council. He was charged with being hostile to the existing government, and with disregarding its interests, Theramenes defended himself, and made such an impression upon the council, that it appeared willing to acquit him. Critias perceiving this, called into the council-chamber an armed band of his followers, whom he had kept in readiness outside, prepared for a force, and marched with his colleagues. Hereupon he declared that with the consent of his friends he erased Theramenes from the list of the Thirty and of the three thousand, and that he might now become to death without trial. Theramenes rushed to the Hesia (the Shaw, or variety), and accused the members of the council to protect him, and not to allow Critias to dispose of the lives of citizens; but the herald of the Thirty called in the Eleven (the executioners), who apprehended Theramenes and led him away to punish him. Theramenes was drunk with amazement at this bold movement, and Theramenes was hurried across the Agora by Saturus and the Eleven to prison. When he had drunk the poison which was administered to him, he dashed the cup with the last few drops to the ground, and said, 'This is to the health of my dear Critias.' This happened in B.C. 401.

The manner in which Theramenes died has been admired by antiquity and modern writers. But his fortitude was not bounded by his consciousness of a virtuous life, and he more deserves admiration than a criminal to whom death is a matter of indifference. Thucydides (viii. 68) says of him that he was not wanting in eloquence and ability. Whether he wrote any orations is uncertain. (Cicero, De Orat. ii. 22; Brut. 21.) He is said to have instructed Isocrates (Dionysius Hali. Isocrat.1) and have written on rhetoric. It may be true therefore, as Suidas says, that he wrote declamations; but it is much more probable that Suidas confounds him with a late sophist, Theramenes of Cos. (Eudocia, 231; Fabricius. Bibl. Graec. iv. 748; Ruhnken, Hist. Crit. Orat. Graec. iv. 40, &c.)

Xenophon, Helen, ii. 3; Plutarch, Nicias, 2; Scholast on Aristoph. Nub. 360; Homer, 47, 546; Didymus Sic. vii. 92; Pliny, Hist. Nat. vi. 50; Ph. Hinrichs. De Theramens., Critiae, et Thrasylalj Rebus et Inventio, Hamburg, 1829, 4to.)

THERAPEUTICUS constitutes that department of medical science which relates to the composition, the application, and the medicinal action of medicinal drugs. Therapists have tried the effects of these upon mankind, and, finding that different drugs counteracted different poisons, they thought that by putting all of them together in a proper collection of dietetic and atmospheric and other ordinary non-medical influences, to the preservation or recovery of health.

THERESIENSTADT (Maria-Theresiastadt, Maria Theresaongel, Szent Maria Szabad, Szobotoroz) is a very large town in the county of Bacs, about 125 miles from Szege, in a plain called Teleki, on the high road to Semlin, in 48° 6' N. lat. and 19° 40' E. long.

After the battle of Mohacs in 1526, the Turks built a fort on the place where the town now stands. The Turks were totally defeated at Zenta, in 1696, by Prince Eugene, as the place was, by the emperor's order, surrounded with Turkish redoubts, and the defence of the frontier towards Transylvania was entrusted to the Turks. In 1714, for eminent military services, it was made a free town or borough, by the name of Szent-Maria, with new privileges; and the population continually increased. The immigration of Roman Catholics and Spanish-German Protestants and Jews, and, and a generation later, by the geographical advantage of its site and its political position, the town has gained for itself by its loyalty to the emperor queen Maria Theresa, it was raised to the rank of a free city on the 21st January, 1779. It is 40 miles northeast of Buda and Debrezn. Theramenes was the imposter in Turin; the Turks now in Hungary; yet it is not properly a town, but rather an assemblage of villages. It is new and clean built without any regularity, and so scattered that many houses might be erected in the vacant spaces. They would be in a dangerous enemy. The town possesses a more extensive territory than any other town in the kingdom, and the area being 556 or, as some say, 734,000 acres (38,000 hectares, or makes it only 36 square miles.) The whole population does not exceed 30,600 of whom 35,000 are in the town; so that the territory is very thinly populated, there being only three miles in it. The southern part of the territory produces vast quantities of corn, and on the northern part, the extensive forests, which are covered with trees of various kinds have been planted under the direction of a competent person. The breeding of oxen is very flourishing, and numerous herds and flocks of sheep are raised. The isolation of the town makes it of no advantage to the Turks. The town is defended by a large wall, the streets, the market-place, and the barracks. There are no manufactories, but the people work at their own houses, chiefly for the army, the town itself. Many follow the business of weaving, tanning, and the manufacture of hairs and carpets, which are particularly skilled in the art of quilling. The city is made from a large wood or herb, the name of which is not known, the red, green, and black dyes for the various carpets which their carpets are made.

(Thiele, Das Königreich Ungarn; Blumenbach, Oesterreichische Monarchie: Die Oesterreichische Encyclopädie; Jenny, Hungary.)

THERIFACA (θερίτακα) was the name given to the antients to all those medicines which were useful as antidotes for poisons, and the science which those which could act upon the exposed to was called θεράπωμα (Galien. Comment. in Hippocr. De An. lib. iii. cap. 7. tom. xv. p. 279. ed. Kühn; id. De An. in Hippocr. De Mot. Vulgar. VI. lib. vi. cap. xviii. pt. ii. p. 397.) Afterwards however the term was found to have been somewhat restricted in its significance, for at least θερίτακα (in the singular number) was applied to particular compound, while at the same time it was considered to be a safeguard and a protection against venemous animals, but also against rule, and the unpleasant food. (Galen. De Antid. lib. i. cap. xiv. p. 1.) Many of these old preparations are preserved in the writings of the ancient physicians, but at the present day we find them used in the form of the Mithridatium (Μυθρίδαιον, or Antitoxin) and the Theriac Andromachi.

The Mithridatium received its name from the Mithridates, king of Pontus, who had a strange disease, and who was supposed to have carried on the intérieur of the Romans, and, finding that different drugs counteracted different poisons, he thought that, by putting all of them together in a proper collection of dietetic and atmospheric and other ordinary non-medical influences and the preservation or recovery of health.
several Nic., however, he was convinced that this king, he took uncommon care to secure his writings, in hopes of some mighty treasures of natural knowledge. He was soon convinced of what he might easily have foreseen; and is represented as having a great regard for his own credit, when, instead of those great arcsana, he only found one or two trivial receipts:

* Aeidiotos vera multa Millthridateis feter Caraoni modis; sed Magari, accurse regi.

Quod Theriac iter, visum deduxi in toto, ad praecipue synthetum, et vulgaris saeas medicamentis rival.

Hoc Theriacum, solis et terrae genus.

Ignotumque saeae, dedit enim corde feus.

Neminem praebens, qui dederat quae pecuia major.

(Sten. Sagona, De Medic., cap. de Venerum. Prod.)

Soon after, however, there was published at Rome a most pompous medicine under the name of Millthridates, which was pretentiously said to have been found among his pages: principal virture was made to consist in its being a most powerful preservative from all kinds of venom; and whoever took a proper quantity of it in a morning was insured against being poisoned during that whole day. (Galen, De Antid., cap. 1.) By this, and by a rumour that some of the Roman emperors prepared it for themselves with their own hands: several physicians among the ancients employed their studies upon it in order to render it more perfect; and it has been the subject of many treatises and of many unaccountable medicines made in emulation of it. But, notwithstanding the supposed improvements of the ancients, the original Millthridatum continued for a long time to be prescribed. It was written in a short Greek iambic poem, which is preserved by Galen (De Antid., lib. ii., cap. x., p. 115, sq.), and which has been published, together with his other poems, Greek and Latin, 1833, 4to., edited by C. F. Keil.

Andromachus the Elder (who was physician to the emperor Nero, and the first person who is known to have received the title of Archiater) made considerable alterations in the Millthridatum by omitting some of the ingredients, adding others (especially us dried flesh of vipers), and by increasing the proportion of opium. His receipt was embodied in a Greek elegiac poem, in order that it might be the more easily preserved without alteration; and this has been inserted by Galen in two of his works: the first time, in the Theriacum, 4to., cap. 6, and has been frequently published in a separate form. Andromachus likewise changed the name of the Millthridatum thus reformed to Theria, but in Trajan's time it obtained the appellation of Theriacum. In the Theriacum, translated by Barthelemy, 8vo., 1576, 12mo.; Nic. Stelliola's, Thericae et Millthridate, Neap., 1577, 4to.; Jo. Bapt. Sylvaticus, De Compositione et Us Thericis Andromachi, Heidelberg, 1597, 8vo.; and in John De Thriaca, Theriacum, 8vo., 1610, 4to.; El. Bonvisinus, De Theriae et Theriaci libri, Andromachi Senioris Mente, Tratilav., 1610, 8vo.; J. Asserius Amping, De Morborum Differentia, et de Thericae Senioris Andromachi, Rostock, 1623, 8vo.; Angel. Bolletz, Theriacus Andromachi Senioris, &c., Palav., 1626, 4to. Charas, Traité de la Thériaque, Paris, 1668, 12mo., quoted by Choulant, Handbuch der Bücherkunde für die Aeltere Medicin.

THERISTYCUS, Wagler's name for a genus of birds.

THERIATUM, Gem.

THERM.E. [BATHS; ROMAN ARCHITECTURE.]

THERMO-ELECTRICITY is a name given to the fluid excited by heat in conducting substances, as wires or bars of metal, generally copper and steel, which are in close contact with each other, end to end, and disposed so as to form a periphery or continuous circuit. Since the effects of heat applied to the ends, or junctions, of the bars are made manifest by a magnetized and balanced needle deviating from its usual position in consequence of the application, thermo-electricity is considered as a branch of electro-magnetism; and it may be said to be connected with the electricity which is excited by heat in tourmaline, boracite, and similar substances. The latter can be magnetized and distinguished from that which is produced by the usual galvanic apparatus, which he proposed to call hydro-electricity.
Some of the most simple experiments by which the effects of thermo-electricity may be illustrated are those which, soon after the discovery, were made by Professor Moll of Utrecht. (Edinburgh Philosophical Journal, vi. 346.) A slip of copper bent into the form of a semicircle was attached (in close contact), at its extremities, to the ends of a bar of antimony about fifteen inches long; and the bar being laid in the direction of the magnetic meridian, and the slips of copper so arranged as to be either in contact or one suspended, or supported on a pivot between them. On heating the northern extremity of the bar by the flame of a lamp, the north end of the needle was observed to deviate towards the west. Again, when a slip of zinc and one of copper was bent so that the extremities, when applied together, there was formed a parallelogram having the junctions of the slips in the middle of the shorter sides, and a compass needle was suspended within the circuit, in placing the apparatus in a plane coinciding with the magnetic meridian, with the longer sides parallel to the horizon (the copper slip being uppermost) and heating the northern point of junction, the needle deviated towards the west: the apparatus being inverted so that the zinc slip was uppermost, in placing the northern juncture as before, the needle deviated towards the east. It follows from these experiments that the fluid current, if such it be, which affects the magnetism of the needle, circulates about the copper slip in such a manner that when the bar is in a horizontal position, its direction is from west to east, passing above the slip, in a plane perpendicular to its length: this effect is similar to that which takes place, though in a contrary direction, when a magnetized needle is brought near a conducting wire joining the needle to the poles of a magnet. A bar of bismuth made parallel to the magnetic meridian, with the copper, or the negative end of the apparatus towards the north, and the needle be below the wire, the north end of the needle deviates towards the east; if above the wire, towards the west.

Effects similar to those which result from the application of heat take place when one extremity of the bar of antimony, or one of the junctions of the zinc and copper, is made colder than the other by means of ice. When both ends of the bar were heated, no deviation was produced in the needle; and after deviation had taken place by heating one end only of the bar, in proportion as the heat tended to a uniform diffusion, the needle gradually returned to the direction of the magnetic meridian.

Thermo-electric circuits may be formed in a ring consisting of two curved bars of different metals, as bismuth and copper, each being in the form of a semicircle, and the bars being placed so as to form a closed circuit; or they may be produced in a rectangle made by placing in close contact four bars of metal, of two different kinds, following one another alternately. One hexagonal circuit of bismuth and three of antimony, which were disposed in alternate order: on heating, by means of a spirit-lamp, one of the places of junction in the ring; or in the rectangle of four pieces, a compass-needle placed within or below the plane of circuit was found to deviate; and it deviated still more when the opposite angles of the rectangle were heated. In the experiment with the hexagonal circuit the deviation was greater in proportion to the number of alternate joints which were heated. Similar results were produced when either the whole or half the circuit was artificially cooled; but the deviation was the greatest when the alternate joints were heated and the others were cooled.

By doubling the lengths of the bars in a rectangle composed of four, the deviation was less than that which was produced by the smaller rectangle; but when the larger rectangle was composed of eight pieces, the deviation was greater.

In charity the subject of thermo-electricity has been diligently pursued by Professor Cumming of Cambridge, who appears to have entered upon it without any other knowledge of the discovery of Seebeck than the simple fact that electro-magnetic action was produced by heating a bar of antimony, which were made fast those of a brass wire; and the details of his researches are contained in a memoir which is published in the 'Cambridge Philosophical Transactions' for 1823.

From these it appears that all perfect conductors of electricity, on being heated or cooled in any one exhibit in general magnetical phenomena; but the discovery of the principle, which was important; and the deviations produced in a magnetized needle, is not the same in all substances, and with some the direction of the current is contrary to that which is produced in others. When a single bar, of symmetrical form, is heated, it is found that the greater the deviation of the compass needle is caused by the opposite currents counteract each other, such as a ring formed of two metals, when heated at one point of junction, being absolutely heated, and the parts were placed in contact with each other, one part of the hot and cold parts, and also the two extensions of the whole compound bar, being connected together, wires), that the action of the whole bar on a needle was greater than that of any two portions, one hot and the other cold, was led to the discovery that electro-magnetism may be exhibited by a line of one or more of a finite number of small plates. He was also enabled to determine the thermo-electric relations of different metals by merely placing in contact each other a small portion of each of the two kinds of metal to be examined, and the needle was observed when one end of a silver or copper wire which was connected with the heated bar. When the metals were bismuth and antimony, the former, on being touched, caused the compass-needle to deviate so as to indicate positive electricity, and the latter, negative electricity. The results of these researches are given in the memoir above quoted there is given a metallic table of the electrical relations of metals in several different combinations. In the same memoir there is also an account of several curious anomalies which were observed in the magnetic action: one of these is, that when a wire is used to touch the metals examined, of which as is iron, the needle deviates a certain number of degrees to the positive direction; then, as the heat of the wire is increased, the deviation in that direction increases, and continues till it becomes zero; after which the deviation takes place in a negative direction, and it becomes a maximum in this direction when the wire acquires a red heat.

If two parallel bars of bismuth are connected at one extremity of each by a line of antimony, so as to form three sides of a square, and the opposite extremities of the bars of bismuth are connected with the two extremities of the bent wire forming an electro-magnetic multiplier: (Electro-Magnetism, p. 342, vol. ii.) the needle is made to deviate, and then turns back to its former position; while the ends of the bars are connected by means of a fourth bar, the effect on the needle is considerable. Now the effect of the galvanic or hydro-electrical current, when produced by some means of heat, and introduced into a circuit with six pieces of copper conductors disposed in like manner, and hence it is inferred that the thermo-electrical current gives rise to a large quantity of that which is the cause of the magnetic action, the power being however in a less state of intensity.

THERMOMETER (from the Greek words ἑλός, ἡλέος, or πέρα, a measure) is an instrument by which the temperatures of bodies are ascertained. It consists of a glass tube with a capillary bore containing in general spirit or mercury, which expanding or contracting by the heat, causes the meniscus at the top of the tube to rise or fall. The instrument is immersed in the liquid or gas which is to be examined, the state of the atmosphere, liquid, or gas; with respect to caloric is indicated by a scale which is adhered to the tube or engraved on its external surface.

The end proposed by the thermometer is the measurement of the temperature of any body with relation to the temperature of some other substance, as of water at the point of freezing; but the measure so obtained must not be understood to express the amount of caloric in any body, being well known that different substances, though exhibiting the same apparent temperature, contain very different quantities of caloric accordant to their capacities for that element.

The extension of his discoveries in use in the beginning of the seventeenth century, but it is not known precisely, to whom the honour of the invention is due. A physician of Padua named Santiorio, and Cornelius Dre
bel of Alkmaar in Holland, are the persons to one of whom that honour is, with most probability, ascribed, and the former, in his 'Commentaries on Avicenna' (1626), actually claims it for himself: it may however have happened with this, as with other scientific discoveries, that the idea of the instrument occurred to two persons or more at the same time.

The first thermometers were intended to indicate variations in the temperature of the atmosphere merely; and the most simple of them consisted merely of a long tube which was open at the opposite extremity: the air within the tube and ball being raised by the heat of a lamp, and the tube being turned upwards so that a column of spiriting entered a vessel containing a coloured spirit; the pressure of the atmosphere on this spirit caused it to ascend in the tube till the expansive force of the air in the ball and the upper part of the tube became equal to the pressure of the atmosphere. In this state, an increase of the temperature of the atmosphere caused the air in the ball to expand and press down the spirit in the tube; on the other hand a diminution of the temperature caused the air to contract, and the liquid in the tube to ascend so far as to render the instrument useless. A scale was adapted to the tube in order to express the degree of temperature by the number of the graduations at the upper extremity of the tube.

An effort was made to render the instrument portable by bending the lower part of the tube upwards and terminating this branch also with a ball; and a small aperture was made in the sur- face of the tube just below it, so that the lower part of the tube might have access to the lower surface of the spirit. Mr. Boyle subsequently modified the air-thermometer by making the tube quite straight and open at both ends: the lower end was immersed in a small glass vessel containing both air and coloured spirit, and the tube formed with a neck which closely enclosed the tube, and was hermetically sealed to the latter. The variations in the temperature of the atmosphere caused the air in the vessel to expand or contract, and thus to press with more or less force on the surface of the spirit; the latter was consequently made to ascend or descend in the tube.

The air-thermometer invented by Aumont (1702) consisted of a tube nearly 4 feet long, open at both ends and curved upwards at bottom, where it terminated in a ball; this tube was 2 inches in diameter, and 2½ inches high, so that the air in the ball was compressed by the weight of two atmospheres. A light body, in which was inserted the lower end of a wire, floated on the upper surface of the column of spirit in the tube; and the length of the upper end of the wire was an index by which the number of the graduation on a scale was shown. The variations of the temperature of the air in the ball caused the mercurial column to ascend or descend in the tube; and thus were induced the corresponding movements in the index. By this instrument it was proposed to measure high temperatures on a scale whose length was only half of that which was required with the simple air-thermometer.

The defects inseparable from all the above thermometers are, that the dilatation of the air is not proportional to the increments of heat, that the length of the column of spirit or mercury varies with the temperature of the atmosphere, also that the air is in contact with the surface of the liquid at the bottom of the column of spirit or mercury, in the latter, exerts more or less pressure according to its density; and thus the indications afforded by the thermometer are rendered erroneous, or require corrections which are not only difficult to be applied, but also impos- sed by Dubuat, and of which the following is a brief description, possesses some advantages above those which have been mentioned; but not being portable, it has never been employed.

It consists of a column of mercury in a tube, like that of a barometer, hermetically sealed at the upper end, and bent below so as to form a short branch inclined at about 40° to the straight part of the tube; this branch terminates in a hollow ball. The mercury occupied a straight part of the tube to the height of about 2½ inches above the bend; and at this bend it terminates without entering into the ball, which, by the construction, is a little above the bend. The part of the tube which is above the column of mercury is free from air, and when the bend is plunged in boiling water the tube is to be in a slightly inclined position, so that a vertical line may pass through the two extremities of the mercurial column. Then, upon the ball becoming cool, and the elasticity of the spirit in it being diminished, the weight of the mercury will cause it to descend in the long branch and rise in the other. The mercury is to be prevented from entering the ball by making the tube a little further from the vertical part, so that the lower extremity of the mercury may remain in the vertical line before mentioned; and the temperature of the air is to be determined by the height of the top of the column of mercury above a horizontal line passing through the lower extremity, that is, by the cosine of the declination of the tube from the vertical. Since the air in the ball preserves constantly the same volume, the elasticity communicated to it by the calorie in the atmosphere, or by the fluid in which the instrument is plunged, is always in equilibrio with the pressure of the column of mercury, which is the force acting against it, and is propor- tional to the vertical height of that column.

About the middle of the seventeenth century the members of the Accademia di Giienza del Cimento in Alkmaar, finding it impossible to construct an instrument in which, instead of air, alcohol or spirit of wine was employed. The fluid was introduced, as at present, into a glass tube terminating at bottom in a hollow ball, from which the air had been expelled by heat; the exterior extremity of the tube was then covered with a cover or sealed, and a scale was applied for the purpose of expressing the temperature of the atmosphere, or of the liquid which was to be examined. Alcohol dilutes and contracts considerably of its volume, proportionally to the degree of temperature which it may be subject, though not in so great a degree as air. It is also capable of measuring very low temperatures, but as it is brought to a boiling state sooner than any other liquid, it cannot be employed to ascertain a high degree of heat.

Sir Isaac Newton, being dissatisfied with the smallness of the range of spirit-thermometers, employed linseed-oil in tubes for the purpose of measuring degrees of heat; this liquid has nearly the same amount of expansibility by increments of calorie as alcohol; and it is capable of bearing very high degrees of heat and cold without either boiling or freezing; but from its viscosity it adheres so much to the interior of the tubes that the series of observations quite impracticable, and on this account it has not since Newton's time been employed for thermometers.

The thermometer which is now in general use is a slender tube containing in a ball of mercury, the air having been expelled and the tube afterwards hermetically sealed. The idea of employing this fluid for the purpose of measuring degrees of heat by its expansion is supposed to have first occurred to Dr. Halley; and the reason why it was not employed by that philosopher appears to have been that the range of its expansion is much less than that of alcohol. According to Boer- haave (Elementa Chemica, 1725), the honour of having been the first to recommend a mer- curial thermometer is to be ascribed to Römer, the discoverer of the motion of light, who is said to have invented it in 1709; but it was not till the year 1724 that the thermometer was known in this country. In that year an account of a mercurial thermometer which had been invented by Fahrenheit, of Amsterdam, in 1720, was read before the Royal Society, and was included in the 'Transactions' (vol. xxxiii.). The advantages of mercury over alcohol and air, as a measure of temperature, are, that its expansions are more nearly proportional to the increments of those which take place in the other fluids; it is easily deprived of air, and its power to conduct heat being considerable, the changes of its volume by changes of tempera- ture surrounding it take place more rapidly than those of any other fluid except the gases.

At first the scales for measuring the degrees of heat were
arbitrary, and consequently no two thermometers could be compared together: the scale of the Florentine thermometer was determined by marking the place where the top of the spirit stood in the tube when the latter was immersed in snow, and the place at which it stood at the time of the greatest heat in Florence: the interval between the points was divided into 60 parts. Subsequently in this country, Mr. Boyle and Sir Isaac Newton formed scales for determining the expansion of the spirit of life by making the space included in each degree of the tube equal to a certain portion of the whole volume: thus, supposing the ball of the thermometer and part of the tube to be divided into ten thousand equal parts, and to be which occupied by the oil when the instrument is plunged in melted ice, Sir Isaac found that by the heat of the human body the oil expanded 256 such parts, and by that of boiling water, 725 parts; then, considering the point at which the top of the column stood in the tube, when the body was placed in ice, as the zero of the scale, he divided the interval between this point and that at which the top of the column stood when the ball of the thermometer was placed under the arm of a man, into 12 parts. Afterwards by proportion be found the distance from the ice to that of boiling water was equal to 34 such parts (Phil. Trans., vol. xxii.): this method, being of difficult execution, was soon abandoned.

The scale which has been in general use in this country since 1724 is supposed to have been invented by Fahrenheit. It is quite unknown on what ground he made choice of the fixed points on his scale, or of the number of graduations between them; but it is thought that one of the fixed points was that of boiling water, and that other his determinations were such that at the top of the column stood which the instrument was exposed to an intense cold in Iceland, in 1709. The extent of the scale between this last point and that of boiling water is divided into 212 parts and the freezing point at the thirty-second division from the zero point. See the scale on the right of the tube in the above figure.

M. Réaumur constructed a thermometer in which spirit of wine was employed, and he formed a scale in a manner nearly similar to that which had been put in practice by Sir Isaac Newton. He computed the volume of the glass ball, and graduated the tube so that the space between two divisions was equal to one-thousandth part of that volume: he then found the zero of the scale by marking the place where the top of the column stood when the thermometer was placed in water just freezing; and afterwards, plunging the instrument in boiling water, he observed whether or not the spirit rose exactly eighty divisions: afterwards he reversed the scale so that the spirit fell 80 divisions and the point at which the top of the spirit stood became the point of boiling water. Of this instrument an account was published in the Memoires of the Academy of Sciences for 1720, but the construction has been long since abandoned, besides being indicative of giving a proper degree of strength to the spirit, it is well known that the latter cannot be made to take the temperature of boiling water, so that the determination of the upper point in the scale must be very erroneous. That which is now called Réaumur’s thermometer is an improvement on the former, by M. Deluc, who determined the points of freezing and boiling water by experiment, and divided the distance between them into eighty parts, the zero of the scale being the former point. See the scale on the left of the tube in the above figure.

A third scale, called Centigrade, has been much in use among the philosophers of the Continent within the last fifty years: it was invented by Celsius, a Swede, and it differs from that of Réaumur or Deluc, only in the distance between the points of freezing and boiling water being divided into 100 parts. The length of each degree in this thermometer, as well as in that of Réaumur, is greater than that of Fahrenheit; and consequently the indications of temperature, when the mercury is between the lines of division, are rather uncertain, from the difficulty of estimating them accurately by the eye: also, the temperatures required to be determined by water or ice, or the point of freezing-water, the employment of negative signs is of more frequent occurrence with these thermometers than with those of Fahrenheit.

The following formulæ will serve to convert any given number of degrees on Fahrenheit’s scale into the corresponding number of degrees on Réaumur’s and the Centigrade scales, and vice versa.

Let F, R, and C be any given number of degrees on the three scales respectively; then:

\[ (F - 32) \times \frac{9}{5} = R, \quad \text{and} \quad (F - 32) \times \frac{5}{9} = C. \]

Also, when F, R, or C expresses any given number of degrees below zero on its proper scale, it must be considered as negative.

The scale invented by De Pile of St. Petersburg in 1733, being still occasionally in use, it may be necessary to mention that it is formed by taking the space included in each degree equal to one hundred-thousandth part of the whole volume of the mercury: the zero of the scale is at the point of boiling-water, and between this point and that of freezing-water the space is divided into 150 parts. It may be observed that the point on the scales of thermometers can be determined with great accuracy if the ball and part of the tube be immersed in pounded ice; for it is known that water containing ice is never removed at the same temperature of ice dissolved in water, the water being employed in promoting the dimissum.

But the point of boiling water is far from being precisely known, since it varies with the density of the atmosphere at the time of making the determination. Distilled water in an open vessel, and under a given pressure of the atmosphere, boils at an invariable temperature, except as far as the nature of the vessel may make some difference; for if the heat communicated to the water be increased, the temperature of the water and the greater quantity of steam in a given time: in a vessel exhausted of the air the water will boil at a temperature expressed by 86° or 100° of Fahrenheit's scale, while in a vessel constructed so as to prevent the steam from escaping it will reach, in a liquid state at a temperature expressed by above 400°. In order therefore that the temperatures indicated by different instruments may agree together, it is recommended that this point should be found from water boiling in the open air at a height of the mercurial column in the barometer 29 inches, and when the temperature of the air is indicated by 50° of Fahrenheit’s scale.

This effect of the pressure of the atmosphere on the boiling point was noticed by Fahrenheit in 1738, and M. Deluc, in his Recherches sur les Modifications de l’Atmosphère, has investigated a formula for determining the height of the boiling-point above the freezing-point of the scale in terms of the height of the mercury in the barometer; but the English artist Bird was the first who applied a correction on account of the state of the barometer, for the purpose of fixing the point of boiling water on the scales of thermometers. The Royal Society having, in 1776, appointed a committee to consider the best means of adjusting the fixed points of thermometers, the formula of Deluc was verified; and reduced to English measures for the benefit of artists in the event of their being obliged to make the instruments under different states of the atmosphere with respect to density and temperature; and the following are some of the corrections which are given by Sir George Shuckburgh for determining the true place of the boiling-point of water. The first column contains the height of the barometer in inches; the second, the correction which is to be applied with its proper sign to the number 212 on Fahrenheit’s scale, in order to give the correct number of
degrees at which the water will boil under the pressure expressed by the height of the mercurial column. The committee observe that in trying the heat of liquors, the quicksilver in the tube of the thermometer should be heated to the same degree as that in the bulb; or if this cannot be done, a correction should be applied on that account. (Phil. Trans., vol. lxvii.)

Thermometer-tubes should have their bores very slender, and, if possible, perfectly equable in the whole of their length. When there is any inequality in the transverse expansion by a few divisions of the scale vary so that they may correspond to the equal divisions of a cylindrical tube; and in order to ascertain the relative dimensions of the sections, they cause a small quantity of mercury, about an inch in length, to cool, by allowing it to flow slowly down the tube in different places; then, since the lengths are inversely proportional to the areas of the sections, the variations of the former will immediately show the corresponding variations of the latter. It is usual to give to the bore an oval form with the broader side towards the front, in order that the mercury or spirit may be easily distinguished at a certain distance, as by approaching very near the instrument, the heat of the observer's person may affect the length of the column.

It is of course essential that the extent of the thermometer-scale should be great enough to comprehend all the temperatures at which the substances generally required to be examined exist in a state of fluidity; and this extent is greater in the scale of alcohol than in that of water, because its expansion is greater. According to the experiments of Mr. Dalton, mercury does not boil till it has acquired a temperature equal to 660° of Fahrenheit's scale; and it does not freeze till it is subject to a pressure equal at 120° below the zero of that scale, or 71° below the freezing-point of water. Pure alcohol, on the other hand, has never been frozen, though it has been exposed to a degree of cold exceeding that which is expressed by 91° below the zero of Fahrenheit; and therefore a scale of the thermometer is to be preferred to one of mercury when it is intended to ascertain the temperature of the air in high northern or southern latitudes: but since the spirit boils in air with a degree of heat expressed by 175° of Fahrenheit, it is unfit for many of the purposes of thermometers, and instruments capable of measuring very high temperatures, see PYROMETERS.

In the construction of a thermometer, the air should be carefully expelled from the tube, and even in Fahrenheit's manufacture in watches, the variations of the density of the atmosphere cannot of course affect the instrument, since the tube is hermetically sealed. It must be observed however that the indications of temperature are not of the same accuracy as those of the dilatation of the mercury or spirit only, but in terms of the excess of that dilatation above the dilatation of glass. The apparent dilatation of mercury in a glass tube is equal to \( \frac{1}{5} \) of its volume, between the temperatures of freezing and boiling water; and its true dilatation between the same limits is \( \frac{1}{375} \) of its volume.

A perfect thermometer would be one in which the expansions of the fluid in the tube were exactly proportional to the increments of heat which it might receive from the substance whose temperature is to be determined; but it cannot be said that any of the fluids which as yet have been tried for this purpose, and which possess this property. Mercury is the fluid in which it exists in the greatest degree; but from the accurate experiments of Deluc it has been ascertained that, between the points of freezing and boiling-water, the temperature indicated by the mercuリアル thermometer is lower than the true temperature, the greatest difference, which however is only equal to 1°.4 of Réaumur's scale or 3°.15 Fahrenheit, being, in the middle between those points on the scale. From the same experiments it is also found that when the temperatures are regulated so as to agree at the points of freezing and boiling water, whether the liquid be oil, spirit, or water, the indications are always below those of mercury; the difference being the greatest at the middle between those points. With oil of olives the difference is 1° of Réaumur's scale (2°.25 Fahr.); with highly rectified alcohol, 4°.9 Réaumur (11°.02 Fahr.); with half alcohol and half water, 9°.7 Réaumur (15°.07 Fahr.); and with water, 19°.5 Réaumur (43°.97 Fahr.). It must be observed that great irregularities take place in the expansion of all fluids when near their boiling state, and that mercury contracts very suddenly when at the point of its condensation. The difference in the dilatation of the spirit-thermometer from the true indications of heat is known to be rather greater than those of the mercurial thermometer: it may be added that the alcohol in a thermometer-tube loses, in time, part of its strength; and that in consequence, the degree of separation of heat at any two temperatures is not the same when the instrument was made. The expansion of alcohol for temperatures greater than about 175° Fahr., at which the spirit boils, cannot be ascertained practically, because the spirit passes into a stable state of vapour; and the comparison between the mercurial and the spirit thermometer ought not to be carried higher than that temperature; or the scales for mercury and spirit ought to be regulated so as to agree with one another at the freezing-point of water and at the temperature of 175° Fahrenheit; if this were attended to, the differences between the indications of the mercurial and spirit thermometers, above that point, would be less than they appear to be by the tables of Deluc.

Water, like other substances, suffers a diminution of volume by the abstraction of caloric, but when it is cooled to a temperature between 39° and 40° of Fahrenheit's scale, it seems to have attained the maximum of density; and if the process of cooling be continued, then there increases in the whole volume a certain expansion which can be computed to be equal to 10° or 30° of the scale. The cause is uncertain, but it is probably owing to a partial crystallization, which may begin to take place in water when at a temperature expressed by about 8 degrees above its freezing-point. The mercurial thermometer is therefore equal to one of mercury when it is intended to ascertain the temperature of the air in high northern or southern latitudes: but since the spirit boils in air with a degree of heat expressed by 175° of Fahrenheit, it is unfit for many of the purposes of thermometers, and instruments capable of measuring very high temperatures, see PYROMETERS.

Register Thermometers. — It is of great importance in meteorology that the observer should be able to ascertain at a glance the highest or lowest temperature of the thermometer scale at which the column of mercury may have stood during his absence; and several contrivances have been adopted by artists in order to obtain this end. Of these, one, which is still preferred, was invented by Mr. Six, whose name the instrument bears, and is described in the "Philosophical Transactions" for 1782. It is a long tube bent so as to form three parallel branches, A, B, and C: the part A is an elongated bulb, and the rest of the tube has a capillary bore. The lower portion, B, contains mercury up to point C to certain points, as a and c, and the bulb is filled with spirit of wine, which passing over the bend at d, descends to the upper extremity of the branch C, and returns to the mercury in B. This branch C is also filled with spirit to near the upper extremity, which is hermetically sealed. Two small indiaces of steel coated with glass, which are attached to the above, are introduced in the branches B and C. When these are capable of being forced upwards by the rising of the column of mercury in either tube, and they have about them a fine wire or a thread of glass; so that they will remain stationary where they happen to be when the heads a and c of the columns recede from
them. Their lower extremities consequently indicate the points at which the ends of the columns may have stood before such recess.

It is evident that the expansion of the spirit in A by increments of heat, will cause that which is in B to press down the column of mercury in that branch and force up the extremity c, moving the index n before it, while by its friction the index m is prevented from descending. On the other hand, the contraction of the spirit allows the elasticity of the air in the ball D to force the column in C downwards, the index n remaining at the highest point to which it had been previously raised; the mercury in B then rises up, carrying the index m before it, till an augmentation of the index n of two or three degrees causes the particle A to expand, and again force the mercury in B downwards.

The graduations on the scale belonging to the branch C are numbered upwards; while the graduations on the scale belonging to B are numbered downwards. The points a and c should always indicate the same degree on the two scales; and by means of a magnet the indices m and n may be brought down to those points: from thence afterwards the former ascends by a decrease, and the latter by an increase of temperature.

An instrument of this kind is generally used for ascertaining the temperature of the ocean at considerable depths, or of the atmosphere at great heights.

**Differential Thermometer**—This instrument, which was invented by Professor Altmann, of Altdorf, and was revived by Professor Leslie in 1804, consists of two thermometer tubes, terminating at one extremity of each, in a hollow glass bulb, and containing coloured sulphuric acid: the opposite extremities are united by the flame of a blow-pipe, and an empty space made at the place of junction. The tube is then bent so as to form three sides of a rectangle, the two balls, which are of equal diameter, forming the upper extremities of two sides; and the instrument is on a stand with the branches of the tube in vertical positions. When the temperature of the air in the two balls is the same, the acid occupies one side and the base, and rises a little way up the other side of the rectangle. To the latter side is attached a graduated scale, with the zero of which the upper extremity of the acid in that branch should coincide. In the event of this adjustment being deranged, it may be readily restored by means of a small piece of engraved glass, carefully fitted with the extent of the scale made above the junction of the two bulbs.

The temperature in the apartment will evidently have no effect on the instrument, since the action upon the two balls will be equal; but if one ball alone be heated, the rise of the acid in the other will immediately indicate the difference between the temperatures of the media about the two balls, by the excess of the expansion of the air in one ball above the expansion in the other. The delicacy of the instrument is such that the least difference of temperature is immediately sensible by the movement of the acid.

**Radiating Thermometer, or Actinometer.**—For the purpose of measuring the intensity of solar or terrestrial radiation, an instrument, called an Actinometer, has been used. It consists of a hollow cylinder of glass, which is united at one end to a thermometer-tube, the latter being terminated at the upper extremity by a ball, which is drawn out to a point, and broken off so as to leave a very small orifice: this is stopped up with wax, which is to be removed when the instrument is to be cleaned. The other end of the cylinder is closed by a silver cap, fitted with a small cap of the same metal, which turns tightly in a collar of waxed leather. The cylinder is filled with a deep blue liquid, and is enclosed in a box, which is blackened on three sides internally, and has a thick glass in front. The use of the screw is to allow the cylinder to increase the pressure as the thermometer thermometer increases. It is recommended that some liquid is drawn from the tube, and that some water be taken from the side of the box, then to fill the cylinder and close the tube. By the increase of the cylinder and the whole stem of the thermometer with the liquid in an unbroken column. When the instrument is to be used, it is placed in a horizontal position with the glass face of the box upwards.

In making observations, the instrument is disposed so that the sun may shine directly upon its face, when the liquid will mount rapidly in the thermometer stem; this should be allowed to do for three or four minutes, after which, by turning the screw, the extremity of the liquid column must be brought to the zero of the scale. At ten seconds before a complete minute is indicated by the watch, the sun shining on the instrument, the observer begins to follow with his eye the top of the rising column of spirit, and counting by his ear the beats of the watch, when the sun ceases of its own motion, to read the index, and the beginning of the graduation corresponding to the top of the column then, waiting till the watch is at ten seconds before the next minute, the observer follows the rising column as before, and, counting the beats by the watch, the minute he registers separately the height of the column of liquid. The instrument being then drawn into the shade, or covered with a screen, a pair of observations, at the interval of one minute, are made and registered as before, the liquid descending in the tube between the last two observations. The instrument is again placed so that the sun may shine on it, and afterwards in the shade, when two other pairs of observations are made, and so on.

A mean of the two differences between the readings at two min. before and after the year makes the observation, added to the difference between the readings at the intermediate observations while the instrument was in the shade, is taken as a measure of the intensity of the sun's radiation at the middle time between the first and third observation. The mean of the three observations is the average of observations is considered as the general mean.

An approximation to the measure of solar radiation may be obtained by simply exposing a register thermometer complete, but blackened, to the sun's rays, and comparing it with the temperature of the room in the same manner as described above.

**[Radiation.]** The thermometer should be placed a few inches above the ground, and be screened from current of air; and the graduations should be made on the side of the thermometer, in order to avoid the errors arising from the heat, and to save the cost of the columns. The force of terrestrial radiation may be measured by the maximum temperature of a register thermometer, whose ball is placed in the focus of a paraboloidal mirror. The face of the mirror is to be turned towards the face of the sun, and heat derived from the thermometer, or the temperature of the air in the room; and the temperature of the instrument, as compared with that of the thermometer, will give the force of the radiation.

**THERMOMETER, DIFFERENTIAL.**

**THERMOPYLE.** [Zeiroun, Gulf of.]

**THERMOSTAT, or Heat-governor, an apparatus consisting of a small thermometer having a register thermometer, or gauge glass, in the processes of vaporization and distillation, in heating baths and hot-houses, in adjusting the draft of stoves and furnaces, in ventilating apartments, &c. A Thermostat is a machine for the uniform control of the temperature or heat of apparatus or substances, and the temperature of the thermometer, or the temperature of the air in the room; and the temperature of the instrument, as compared with that of the thermometer, will give the force of the radiation.

**THERMOPHYLLITE.** [Zeiroun, Gulf of.]

**THERMOSTAT, or Heat-governor, an apparatus consisting of a small thermometer having a register thermometer, or gauge glass, in the processes of vaporization and distillation, in heating baths and hot-houses, in adjusting the draft of stoves and furnaces, in ventilating apartments, &c. A Thermostat is a machine for the uniform control of the temperature or heat of apparatus or substances, and the temperature of the thermometer, or the temperature of the air in the room; and the temperature of the instrument, as compared with that of the thermometer, will give the force of the radiation.
THE TEMPLE OF THESEUS.

The temple of Theseus is in a state of greater preservation than almost any of the antient monuments of Athens, and is used in the present day as a Chruch consecrated to St. George. It is built entirely of Pentelic marble, and stands upon an artificial foundation formed of large quadrangular blocks of limestone. Its architecture is of the Doric order. It is a peripteral building, or surrounded by columns, having six in each front. There are thirteen columns on each side, including those at the angles, which are also reckoned among the six belonging to each front, so that the whole number surrounding the temple is thirty-four. It consists of a cela forty feet long, having a pronaos to the east and a porticus to the west. The pronaos and the portico are together thirty-three feet in depth, and the porticus with its portico twenty-seven feet. The breadth of the temple is forty-five feet. The columns are three feet four inches in diameter at the base, and rather more than eighteen feet and a half high, with an intercolumniation of five feet four inches. The height of the temple from the summit of the pediment to the base of the columns is about thirty-one feet. The platform upon which it is built, and which consists of only two steps, is about two feet four inches in height.

The eastern front of the temple was the principal one. This is shown not only by the greater depth of the pronaos, but still more distinctly by the sculptured frieze. The pediment only are there any traces in the marble of metallic fastenings for statues; and the ten metopes of the eastern front, with the four adjoining ones on each side, are exclusively decorated with sculpture, all the others on both sides and on the western front being occupied by other parts of the ornament adorned with sculpture are the friezes over the entrance of the pronaos and the portico.

In the British Museum there are casts of the greater portion of these friezes, and also of three of the metopes from the northern side, being the first, second, and third, commencing from the north-east angle. They were made at Athens, by the direction of the Earl of Elgin, from the sculptures which then existed upon the temple, where they still remain. The rest have disappeared, this being at the time when Paré made the drawings for Stuart, but enough remains to show that they belong to the highest style of Grecian art: they are almost equal, and, by some, considered even superior, to those of the Parthenon. The relief is bold and salient, approaching to the perfection of the entire statue, the figures in some instances appearing to be only slightly attached to the table of the marble. It appears that all the sculptures were painted, as was the case in many other Grecian temples. Col. Learke says that vestiges of brown and green, blue and golden-coloured, of orange, of red, and of black, and of sky, and of blue, green, and red drapery, are still very apparent.

The subjects of the sculptures are the exploits of Theseus, and those of his friend and companion, Theseus. The metopes in front of the temple represent the labours of Hercules, and those on the two sides to those of Theseus. On the frieze of the portico is represented the combat of the Centaurs and the Lapithae, in which Theseus was engaged; but the subject of the frieze of the pronaos is very doubtful, owing to the mutilated condition of the sculptures. Stuart supposes that it represents part of the battle of Marathon, and especially the phantom of Theseus rushing upon the Persians. Col. Learke thinks it probable that the pannier over the pronaos relates to the exploits of Hercules, in the same way as the other friezes relate to those of Theseus; and he supposes to represent the battle of the giants, who are said to have been subdued chiefly through the exploits of Hercules (Muller (Denkmaeler der antiken Kunst, p. 11) concedes it to represent the contest of Theseus against the Pallantide, who wished to destroy him when he was acknowledged by Agaeus as his successor. Mr. Hawkins (Description of Antient Marbles, in the British Museum, 1st ed.) implies that not one action alone is intended to be represented, but three or four achievements are here recorded, the subjects being separated from one another by groups of seated divinities.

The interior of the temple originally contained three paintings on the walls by Micon, which Pausanias saw and describes (i. 17. § 2). One represented the battle of the Athenians with the Amazons, the second that of the Centaurs and the Lapithae, and the third an action of Theseus in Crete. The stucco upon which these paintings were

Fig. 3. Fig. 4.

bars are always curved, and the action of the apparatus depends upon the intermission or decrease of the ordinary friction. Fig. 4, for example, represents a thermostat, with two moveable hoops, a, a, which may be impressed horizontally beneath the surface of the water-bath of a still. The hoop is fixed at b, and to its free ends are attached short links c, c, which impart longitudinal motion to the rod d. e is a lever-handle moved by the sliding-rod, and turning a valve on its axis f. The outer end of this lever carries an index, which moves against a graduated scale. g is a screw-nut, moveable upon the sliding-rod, to adjust the apparatus before graduating the scale on the traversed by the index. Some other forms of the apparatus are given in Dr. Ure's Dictionary of Arts, &c., pp. 1237-1239; and on p. 643 of the same work is described a confrivance in which the same natural principle is differently applied.

THÉOGENIE. [PA DE CALAWS.]

THESEUM (Oégeion), the temple of Theseus at Athens, was situate in the north-west part of the city, at no great distance from the gate which led to Eleusis, and immediately above the gymnasion of Ploemey. It was built in honour of Theseus, soon after his bones had been brought from Scyros to Athens by Cimon, &c. 409. (Plutarch, Theseus, 36; Cimon, 8; Dion. Sic., iv. 62.) It possessed as inviolable asylum, where runaway slaves in particular were accustomed to take refuge, and was equipped in sanctuary only by the Parthenon and Eleusinum. (Plutarch, De Exilio, p. 607 A; Hesychius, and Phrynolog. Mag., under Oégeion.) Its sacred enclosure was so large as to serve sometimes as a place of military assembly. (Thucyd., i. 91.)

by the dotted lines, by which means the position of the lever was altered, the valve c will be turned on its axis, and the damper will be raised. Fig. 2 shows another arrangement, in which two compound bars, a, a, fixed at b, are made to open and close a valve c, in a pipe through which air, water, or any other fluid is passed. By increasing the temperature of the apparatus, the upper or moveable ends of the bars would recede from each other, and, consequently, alter the position of the valve. A similar contrivance may be placed in a chimney, to modify the position of a damper-plate moving upon its axis, and thereby to regulate the draft. The application of such an arrangement of compound bars to the admission of water in a water-bath is described in the article Distillation, vol. i., p. 26. Fig. 3 shows the principal part of a thermostat apparatus in which three pairs of compound bars, a, a, a, are used to give motion to a sliding-rod d, d, with which any kind of valve may be connected. A rod and union, a chain and pulley, or otherwise. b, b, in this figure, is a straight guide-rod, which is fixed at one end by a screw-nut; c, a milled head being added for the purpose of adjusting the apparatus, so that it may act at any required temperature. The thermostat bars, in this as well as the previous cases, are nearly or quite straight when cold, and become more or less curved by the action of heat; but in some modifications of the thermostat the
executed is still apparent, and shows that each painting covered the whole wall from the roof to two feet nine inches short of the pavement.

There was also a sanctuary of Theseus in the Peireneus, as appears from an inscription. (Böckh, Corp. Inscr., No. 105, 30.)

"Glycon's Athens, vol. iii.; Leake's Topography of Athens; Description of Antient Marbles in the British Museum, part i.; Forchhammer, Topographie von Athen, Kiel, 1841.)

The Athenians (epoxyia), the great national hero of Athens, is said to have been born at Trozen, where his father Aigeus, king of Athens, slept one night with Aithra, the daughter of Pittheus, king of the place. Aigeus, on his departure, hid his sword and shoes under a large stone, and told Aithra, if she brought forth a son, to send him to Athens with these tokens, as soon as he was able to roll away the stone. She brought forth a son, to whom she gave the name of Theseus, and when he was grown up, informed him of his origin and told him to take up the tokens and sail to Athens, for the roads were infested by robbers and monsters. But Theseus, who was desirous of emulating the glory of Hercules, refused to go by sea, and after destroying various monsters who had been the terror of the country, was in safety. He was joyfully recognised by Aigeus, but with difficulty escaped destruction from Mezed and the Pallantids, the sons and grandsons of Pallus, the brother of Aigeus. These dangers however he finally surmounted, and slew the Pallantids in a single night.

His next exploit was the destruction of the great Marathonian bull, which ravaged the neighbouring country; and shortly after he resolved to deliver the Athenians from the tribute that they were obliged to pay to Crete. Every minyan year the Athenians had send seven young men and as many virgins to Crete to be devoured by the Minotaur in the Labyrinth. Theseus volunteered to go as one of the victims, and through the assistance of Ariadne, the daughter of Minos, with whom he fell in love, he slew the Minotaur and escaped from the Labyrinth.

He then sailed away with Ariadne, whom he deserted in the island of Dia or Nazos, an event which frequently forms the subject of antient works of art. The sails of the ship in which Theseus left Athens were black, but he promised his father, if he returned in safety, to hoist white sails. This however he neglected to do, and Aigeus seeing the ship draw near with black sails, supposed that his son had perished, and threw himself from a rock called the Caleua. The Athenians in revenge invaded Attica, and were with difficulty defeated by the Athenians. This battle was one of the most famous events of ancient times, and is commemorated in several works of art that are still extant. Theseus also took part in the Argonautic expedition and the Calydonian hunt. He assisted his friend Phintias and the Lapiathe in their contest with the Centaurs, and also accompanied the former in his descent to the lower world to carry off Proserpine, the wife of Pluto. When Theseus was fifty years old, according to tradition, he carried off Helen, the daughter of Leda, who was then only nine years of age. But his territory was invaded in consequence by Castor and Pollux, the brothers of Leda; his own people rose in arms, and at last, finding that he had withdrawn to the island of Scyros, and there perished either by a fall from the cliffs or through the treachery of Lycomedes, the king of the island. For a long time his memory was forgotten by the Athenians, but he was subsequently venerated by them as the founder of the city. At the battle of Marathon they thought they saw him armed and bearing down upon the barbarians; and after the conclusion of the Persian war, his bones were discovered in Marathon, to which he was next taken to Athens, where they were received with great pomp, and deposited in a temple built to his honour. [THESEUS.] A festival also was instituted, which was celebrated on the eighth day of every month, but more especially on the eighth of Pyanepson.

The above is a brief account of the legends prevailing respecting Theseus. But he is moreover represented by antient writers as the founder of the Attic commonwealth, and even of its democratical institutions. It would be waste of time to inquire whether there was an historical personage of this name who actually introduced the political changes ascribed to him; it will be convenient to turn to the account in describing them as the work of Theseus.

Before his time Attica contained many independent townships, which were only nominally united. Theseus incorporated the people into one state, removed the princes from the administration of the government, and enlarged the city, which had hitherto covered little more than the rock which afterwards formed the citadel. To cement their union he instituted several festivals, and especially changed the Athenians into the Panathenians, or the local habitants of the country, and invited them to Athens, and surrendered a part of his kingly prerogatives to them, for which reason he is perhaps represented as the founder of the Athenian democracy, although the government which he established continued, and lasted for ever after him, strictly aristocratical. For he divided the people into the tribes or classes of Eupatrides, Geometric, and Demiurgi, of whom the first were nobles, the second agriculturists, the third artisans. All the offices of state were placed in the hands of these three classes, and of them were nearly equally disposed to themselves. Each tribe was divided, either in his time or shortly afterwards, into three phratries, and each phratria into thirty gentes (μηγενεία). The members of the separate phratries and gentes had religious rites and religious festivals of their own, but dedicated the spoils which they gained after these communities had lost their political importance by the democratical changes of Cleisthenes. (Clemens in Ariston. Plutarch's Life of Theseus; Meil步ius, Theseus, in his text.) He introduced Attic, according to some writers, by Orphism and according to Herodotus (ii. 171) by the daughter of Danaus from Egypt. Its celebration was confined to the quarter yearly markt, and was observed in Athens. It commenced ever with some literature and festivals, and lasted according to some writers for four, and according to others for five days. The discrepancy in this case, as well as in several of other Greek and Roman festivals, seems to have arisen from the circumstance that the real festival was in ordinary instances preceded by one or more days devoted to preparations and purifications, and that some writers reckoned these days as belonging to the festival. Now the Theseum were preceded by such a festival, and during these days the Athenian women underwent various kinds of purifications. Wellhew, in his little work cited below, has rendered it more probable that the festival itself did not last more than three days.

Previous to its celebration the women of each deme elected from among themselves two matrons to conduct the solemnities, whose husbands, provided they had received a dowry of not less than three talents, had to provide for the expenses of the festival as such. (De Ceris Heredit., p. 208.) The first day of the festival was called dwoDị or sdoDị, that is, the procession, because the women went from Athens to Eleusis in a procession of which the place is not exactly stated. They wrote either in books or upon tablets. During the next between the first and second day the women solemnized their mysteries at Eleusis. The second day, called vymwa or 'the Fast,' was a day of mourning, on which the women were not allowed to take any other food than a sesame and honey, and the greater part of it they spent sitting in mournful attitudes on the ground around the
The statue of the goddess. Meurinus and others think that the procession to the Thesmophorion (the temple of Demeter Thesmophoros) at Athens, which is alluded to by Aristophanes (Thesmophor., 276, &c.), and in which the women walked behind a waggon laden with baskets containing mystai, this took place in the afternoon of this day, the women being arranged in twos and threes, and the men in threes and fours, neither the senate nor the people were allowed to hold their usual meetings. The third day was called eklystion, a surname of Demeter, by which she was invited on this occasion, upon a prize with Choerilus and Phrynichus, who is called his disciple. Thespius is also said to have distinguished himself in orcheatic, or the art of dancing (Athenaeus, i., p. 22), which however can only refer to his skill in instructing the chorus.

Bode, Geschichte der Dramat. Dichtkunst der Hel- lenen, i., pp. 40-57; Müller, Hist. of the Lit. of Greece, i., p. 292, &c.)

THESPROTTA (Thespæria), a district of the antient Epirus, around the river Acheron. Its boundaries are not distinctly stated by antient writers, but the district seems to have included the coast from the mouth of the Ambracian Gulf northward to the river Thaymus, and the country inland as far as Mount Tomaras. The south-eastern part of it was given by the Achaeans to the Illyrians, and is sometimes reckoned as a distinct district; but the other statement appears more correct, since Herodotus makes the Thesproti neighbours of the Ambracians and Lacedaemonians. (Herod., viii. 47.)

This is intimated by the legendary which makes Thespis the son of Lycoean. In Thespia was the oracle of Do- dona (Herod., ii. 56), the chief seat of the old Pælagic race. The Thespoti (to which the sea of the Thessalians is compared) is described by Thucydides as the Hellenes under their antient name of Graeci (Thespiae, Aristot., Meteorol., i. 14.) From this country the Thessali migrated to take possession of Thessaly, about sixty years after the Trojan war, having previously left their country and journeyed to Ionia, where they have the name of Thessalia, and hence the name Thesprotia (divine). There are two species of native of South America: they are all trees, with handsome, showy flowers. In their cultivation they will come across. There is a great deal of sand and cuttings will strike freely in sand or mud under a hot-béd. (Don's Miller, vol. i.)

THESPIS (Θέσπης, a native of Icaria in Attica, who lived in the time of Solon and Pisistratus, about 595 B.C. The antient traditions unanimously represent him as the inventor of the tragedy. The manner in which this invention is said to have originated is stated differently. According to one account, which is also adopted by Horace, it arose from Thespis travelling during the festival of Dionysus through a waggon through the country, and there playing his plays. This tradition however is based upon a confusion of tragedy with comedy, the invention of which is not accredited to Thespis by any antient authority. The inven- tion is supposed to have been the act of a man who at the Dionysiac festivals in the city of Athens entered into conversation with the chorus, or related T. Thespis' drama was the first one to have been performed in the ancient Greek theatre. It is said to have been written and performed in the first Thesmophoria, a festival held in honor of Demeter. Thespis' plays were performed at the Thesmophoria, and it is believed that the festival was created by Thespis himself. Thespis is credited with the invention of the chorus, which is said to have been introduced to the Athenian theatre by Thespis. The Thesmophoria was a festival held in honor of Demeter, and it is believed that Thespis' plays were performed at this festival. Thespis is also said to have introduced the idea of the prologue, which is a type of musical and dramatic performan
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his own letters to the Thessalonians, coupled with the fact of his receiving money from Philippus more than once while he was at Thessalonica (Philipp., iv. 16), it would seem that the motive was, in some measure, pecuniary. Still he was unable to carry his designs into execution: the unconverted Jews stirred up a persecution against him; so that himself and his companions were sent away by the brethren to the church at Berœa. He returned again to the Jews of Thessalonica stirred up a tumult against St. Paul, so that he was obliged to retire to Athens, leaving however Silas and Timotheus at Berœa. At Athens he was subsequently joined by them, and a new naturalization to Timotheus and Silas. He wrote to the Thessalonians and 'when he could no longer forbear' (1 Thess., iii. 1), he sent Timothy from Athens 'to establish them, and to comfort them concerning the faith.' St. Paul then visited Corinth, and on the return of Timothy with 'good tidings' of the Thessalonians, and that they had a good remembrance of him always' (1 Thess., iii. 6), he wrote his first epistle to them, a.D. 52, from Corinth, and not from Athens, as the subscription of the epistle imports.

It was one of the earliest, if not the very first, of all St. Paul's epistles, and in chap. v. ver. 27, he expresses his desire that it should be read not at Thessalonica only, but in all the churches of Macedonia. Its genuineness has always been admitted; together with the second epistle, it was quoted as the work of St. Paul, by Ireneaus, Clement of Alexandria, Tertullian, Origen, and all subsequent ecclesiastical writers. (Lardner, as quoted in Horne's Introduction, vol. iv., p. 372.) The immediate occasion of the writing of the second Epistle is important. It is an unsuccessful intercourse with the Thessalonians, and their apparent desertion of them at a critical moment, might give rise to doubts and appearance of a desertion on the part of the church. St. Paul's last letter to the Thessalonians was accompanied, as evidences of its truth, and commend it for the constancy of their faith.

In chap. iii., as a further confirmation of the truth of the apostolic succession of the Acts of the Apostles, he characterizes himself and the other preachers of Christianity. As a missionary and apostle of Christ, he had suffered, and been shamefully entreated—that in preaching the gospel, he had sought neither temporal profit, nor favour, nor honour. He also explains and vindicates his own conduct in leaving them, and says that although taken from them in presence, he was not in heart—that he had endeavoured to see them again with great desire, but had been hindered till at last, when he could no longer forbear, he sent Timothy to them, at whose good tidings of them he expresses the greatest satisfaction and joy.

In chap. iv. St. Paul exhorts them to persevere in the observance of the duties and practical virtues of Christianity, in conformity with the commandments he had given them at first: and further enjoins them not to sorrow or lament over those that were dead, but rather (even as they believed that Jesus died and rose again) to look forward to the last appearance, when the day of the Lord Jesus, that is, the day of judgment, should come.

In chap. v. (1-5) St. Paul warns the Thessalonians of the uncertainty of this event, and concludes the epistle with a variety of precepts and admonitions addressed partly to them, partly to their servants, coupled with some reproofs, which, as we may suppose, were called for by the irregularities and failings from which the Thessalonians were not yet exempt.

The undesigned coincidences between this Epistle and the Acts of the Apollos are commented upon by Paley in his Horae Paulinœ,' pp. 293-311.

THE SECOND EPISTLE to the Thessalonians was written soon after the first, and from the same place. Silvanus and Timothy being joined with the apostle in the subscriptions of this Epistle, as well as of the former; and as in chap. v. ver. 2 he requests the prayers of the Thessalonians for deliverance from wicked men, it is impossible to think of the insuperable difficulties at Corinth, when they dragged him before Gallo, and accused him of persuading men to worship God contrary to the law.

This Epistle seems to have been occasioned by the information which St. Paul received from the messenger who conveyed his first letter to the elders of the church, and his report of the effect produced by its contents. From some expressions in that Epistle (iv. 18; v. 4-6), compared with chap. v. ver. 10-11, it would seem that the Thessalonians had come to the conclusion that the day of judgment was at hand, and would happen in their generation. To correct this mistake, and to prevent the anxiety and the neglect of secular duties which it appeared to have been the main object and design of St. Paul in writing this Second Epistle to them.

Accordingly, in chap. i., after a short introduction, the apostle proceeds to commend the growing faith and charity of the Thessalonians, and to inculcate the necessity of watching and prayer under tribulation, of which he had heard from the messenger who carried his first letter, and to assure them of his constant prayers for their welfare. In chap. ii. he rectifies their mistake about the day of judgment, warns them of the means by which they might attempt to deceive them on that subject. By way of setting their minds at rest about it, he assures them that the event would not come until 'a great apostacy' had overspread the church, and the revelation of 'the man of sin, the son of perdition,' shown at the last place. These phrases have been variously interpreted, but the generality of Protestant commentators have agreed in referring them to the Roman pontiffs and the Romish church. Some indeed understand them to anticipate some of the leaders to the revolt of the Jews from the Romans. The Romish church contends that one person only is meant, and not a series or succession of persons.

What the apostle meant by these phrases, he reformulates the Thessalonians that this mystery of iniquity was already secretly at work, though its full operation was prevented by a restraining power (ἐνδρύς), which the early Fathers of the Church generally understood to be that of the Roman emperors and empire. (Tertullian, Apolœ, vol. i., p. 31.)

In chap. iii. the apostle desires their prayers for himself and his fellow-labourers, and then reproves some of the Thessalonians for their idleness and irregular life. He concludes with his apostolic benediction, and says that, with his own hand, which, as he informs them, was a token of the genuineness of that and other Epistles similarly authenticated.

This Second Epistle to the Thessalonians is the shortest of all the Epistles, but not inferior to any of them in style or spirit, and it is also remarkable as containing a distinct prophecy of the corruptions and delusions which were to arise in the Christian church.

The undesigned coincidences between this Epistle and the Acts of the Apostles are given in Paley's Horœ Paulinœ,' pp. 312-222.


THESSALONICA (now Saloniki), an ancient city of Macedonia, in the district of Mygdonia, was first called Pera or Thessalonica; it is in 40° 40' N. lat., 22° 56' E. long., about ten miles east of the ancient city of Echepura, at the head of the modern Gulf of Saloniki, formerly called the Thermaic Bay, from the ancient name of the city. It was at first an inconsiderable place till its fall by the Romans, when it was in the days of Herodotus and Thucydides, who, in his 'Periplus,' makes mention of the Thermaic Gulf. Herodotus, in his 'History' (vii. 128), speaks of it as a place where Xerxes moored his army on his march to the war against the Persians. It is in the mountains and Ossa in Thessaly.
short time previous to the commencement of the Peloponnesian war (b.c. 432) it was taken and occupied by the Athenians, but it was soon afterwards restored to Perdiccas, the king of Macedonia. According to an account in Strabo (Epit., vii. 330), the name of Thessalonica was given to it by Cassander, the son of Antipater, in honour of his wife Thessalonica, who was the daughter of Philip, the last king of Macedon, and the sister of Alexander the Great. With a view to its aggrandisement, Cassander collected together (about b.c. 315) the population of several adjacent towns, and made it the most important city of Northern Greece. (Strabo, l.c., p. 330.) After the battle of Pydna (b.c. 168), in which the Romans defeated Perseus, the then king of Macedonia, Thessalonica, with the other Macedonian towns, surrendered to the Romans, and was afterwards restored to him by them, which Macedonia was divided by them. (Livy, lib. xiv., c. 10 and 45; lib. xiv., c. 28.) Livy speaks of it as being then a very celebrated city, to which its admirable position materially contributed. It possessed an excellent harbour, peculiarly well situated for commercial intercourse with the Hellepont and the Aegean; and it had the additional advantage of lying on the great Roman military road, the Via Egnatia, which, commencing at Dyrrachium, on the west, and proceeding by the advanced defiles of the Pindus, afforded the easiest land communication with Thrace, Asia Minor, and the shores of the Euxine. In St. Paul's time it was much frequented by people of different nations for commercial and other purposes, as appears from the fact that he was sent to it by Paulus, the Roman official, who ascended the Hellespont with the Roman army, and that it was also the seat of the Roman government. Pliny (iv. 10) calls it a free city; and Lucian (Asin., 46) speaks of it as the largest of the Macedonian towns. In later times, under the Romans, it continued to be so flourishing and important a city, that it was chosen in the sixth century to be the residence of the prefect of Illyricum, and the metropolis of the Illyrian provinces. (Theodoret, Hist. Eccl., v. 17.) In the reign of the emperor Theodosius it was the scene of a deplorable calamity. Having been selected by the Goths by strong fortifications and a numerous garrison. Their commandant, Botheric, with his principal officers, was inhumanly murdered by the people of the town, in consequence of his having thrown into prison one of the popular characters of the circus, to the games of which the Thessalonians of that time (a.d. 390) were passionately devoted. The emperor Theodosius, in the excitement of his indignation, gave orders for the punishment of the people; and, according to the most moderate accounts, no less than 20,000 were massacred in a promiscuous carnage, which lasted for three hours (Gibbon, Roman Empire, c. xxxvi.), a deed, the guilt of which, as Gibbon observes, was aggravated by the loss of his principal, the emperor of Thessalonica. (Theodosius; Ambrose.)

For an account of the ruins and antiquities of Thessalonica, see Clarke's and Holland's Travels, vol. ii., p. 50; Dodwell's Tour in Greece, vol. ii., c. 19, p. 190; Cramer's Antiquities of Greece, i. 226.

THESSALUS (Θεσσαλος), an ancient Greek physician, son of the celebrated Hippocrates, appears to have lived at the court of Archelaus, king of Macedonia, about 300 years before Christ. He was one of the founders of the medical sect of the Dogmatics, who also took the name of the Hippocratic school, because they professed to follow the doctrines of that great man. However, both he and his brother Dracoon, and his brother-in-law Polysbus, are accused by Galen of having added to the range of Hippocratic principles, the opinions of Hippocrates the principles of later philosophers, but also of altering and interpolating his writings. Several of the works that go under the name of Hippocrates are by many critics supposed to have been written by Thessalus and his brother. The seventh book of the Hippocrates, and the second book of the Practitioners, or Prochorithes; but this conjecture is uncertain.


THESSALUS (Θεσσαλός), one of the founders of the sect of the Thessalians, who was the son of a weaver, and followed the same trade himself during his youth, by which means he lost the opportunity of receiving a good education, and was never afterwards able to overcome this disadvantage. He appears however to have soon given up this employment, and applied himself to the study of medicine, by which he acquired a great reputation, and was esteemed a large and learned man. His work is called the Thessalian, and both intellectual and moral, is everywhere represented by Galen in a very unfavourable light; but it must be confessed that Galen himself appears to very little advantage in these passages, and goes beyond all bounds in his abuse of him.

Thessalus adopted the principles of the Methodicians, but modified and developed them so much that he attributed to himself the invention of them. In fact on all occasions he appears to have aimed at making his writings distinct from those of his predecessors; lavishing upon the antients the most inhumanly insulting epithets; calling himself by the title irdouow (conqueror of physicians), because he thought that he himself surpassed all his predecessors as much as medicine is superior to all other sciences; boasting that he could teach the art of healing in six months; and telling the emperor Nero, in the dedication of one of his works, that none of those who had been before him had contributed anything to the science which he had not himself added. He attracted a great number of pupils, whom he took with him for six months to visit his patients; but most of them are said to have been common artisans and persons of very low extraction. Galen accuses him of knowing nothing of those who had lived before him. He did not care for inquiring into the causes of diseases, and was satisfied with certain problematical analogies; nor did he admit the value of prognostic signs. He did not recommend nor even mention in cases of accidents. A further account of his opinions may be found in Le Cercle, Hist. de la Méd.; Haller, Bibloth. Medic. Pract.; SprengeI, Hist. de la Mèd.

THESSALY (Θεσσαλία), one of the principal divisions of Northern Greece, and the cradle of much of the intellectual life of Greece in general, is an extensive and generally unknown plain, about 80 miles in extreme length and 70 in breadth, comprising an area of about 5500 square miles, and forming an irregular sort of square. This description applies only to what may be called Thessaly Proper, which is bounded on the west, towards Epirus and Thessalina, by the range of Pindus; on the north, towards Macedonia, by the Cambunian Mountains; on the south by the range of Mount Othrys; on the east by a range of mountains running along the coast nearly parallel to Pindus, and including the summits of Pelion and Ossa. The basin of Thessaly is thus surrounded by mountain-barriers, broken at the north-east corner only by the valley and defile of Tempe (or the Thessalian plain), which separate Ossa from Olympus, and presents the only road from Thessaly to the north which does not lead over a mountain-pass. At the eastern base of the mountain-range which runs from Tempe to the base of Olympus, now a narrow vale, through which winds the river Spercheius, and which, though generally considered as a part of Thessaly, is separated from it by the range of Othrys, and is very different from it in physical features. It is bounded on the south by a range of mountains which runs from Thermopylae in a general direction nearly parallel to the Cambunian Mountains; and on its eastern side by the shores of the sea of Mace, now the Gulf of Zeaun. According to Greek traditions, Thessaly has a long narrow vale, through which winds the river Spercheius, and which, at one point to the east of Thermopylae, is separated by a range of mountains from the Gulf of Zaeun. The two former names belong to the age of mythology; the last refers to the time when the country was inhabited by the Thesii, a region in the west of Epirus, and settled in the country, which from them derived its future name. At this time it received the name of Thessaly. The name of Thessaly has been sometimes employed to denote a region extending from the mountains of northern Epirus (Strabo, vii. 345, 176; Strabo, l.c., i. 444), originally came from the Thesprotia, a region in the west of Epirus, and settled in the country, which from them derived its future name. At this time it received the name of Thessaly. The name of Thessaly has been sometimes employed to denote a region extending from the mountains of northern Epirus. At that time it received the name of Thessaly. The name of Thessaly has been sometimes employed to denote a region extending from the mountains of northern Epirus.
with the different chiefs by whom they were governed: it is from Homer (Iliad, ii. 700) that we derive the earliest information about this part of Greece. At an early time Thessaly was divided into four districts, or tetrarchies. These tetrarchies were, according to Strabo (ix. p. 430), Hestiaiotis, Pelasgiotis, Thessaliotis, and Phthiotis: and the division, though it was a well established institution, existed in the Peloponnesian war (B.C. 404).

The first of these tetrarchies, Hestiaiotis, was the mountainous country between Pindus and Olympus; having generally for its southern limit the river Peneus, though Strabo does not form. Later on, all its course. Herodotus (i. 156) applies this name to the country in the neighbourhood of Ossa and Olympus, the original abode of the Dorians before they settled in Pelo-

pnesus. From a statement of 432 B.C. it would seem that the name of Hestiaiotis was derived from a district in Europe, whose inhabitants were transplanted to this part of Thessaly by the Perrhebians. The Perrhebians themselves however only occupied a small part of the territory, and as they are said to have been the original inhabitants of the country of the Lapithae, they must at one time have been established in the lower valley of the Peneus. (Strabo, p. 441.) In historical times they dwelt in the valley of the Tirairesus under Olympus, where they had shrunk back to their mountain home. The northermost part of Hestiaiotis was in anti-historical times (Homer, Ill., ii. 774) occupied by a mountain-tribe of uncertain origin, called the Sithécids. In the time of Strabo (ix. p. 434) Scyths, who are ascribed by the ancient writers and scholars, are often mentioned as inhabitants of this portion of Thessaly.

The most remarkable towns of Hestiaiotis were as follows:-Phalera, or Phaloria, the first town of any importance on entering Thessaly from Epirus by the pass of Pindus (Liv, xxii. 15); Oxyenea and Zeugitum, the latter of which Livy describes as a place of great strength, and almost impregnable. Gymphi (the Wedges), an an-

tient fortress, situated on the Peneus to the south of Phaloria: it was a place of great strength, and might be said to be the northernmost part of Epirus or the territory to the north: it commanded the communication by the gorge of Cinonos, between this part of Thessaly and the Ambraesian Gulf. In the time of Caesar (Bel. Civ, iii. 80) it was a large and opulent city: it is supposed to be represented by the modern Stagous. Tricca, now Trikala, on the left bank of the Peneus, about 12 miles south of Gymphi; it is celebrated by Homer (II., i. 729), and placed by him under the rule of the sons of Zesculapius, who is said to have been born in the neighbourhood. According to Strabo (ix. 437), there was a town of Zeugitum in this territory, which existed in general veneration: about 12 miles to the north of it is now situated the convent of Meteoara, whose name (the Hastings) is descriptive of its situation upon lofty columns of rocks in the north of the Peloponnesus, which contained within its territory the lands of three other places not so famous, but more antient, and which contributed to the formation of the new city. Metropolis, with Gymphi to the north-west, Tricca to the south-west, and Pelinna to the south-east, formed a square of fortresses, in the middle of which was the antient Ithome, called by Homer the 'precipitosa.' Pelinna, more commonly Pelin-

nus, was an important city on the north of the Peneus, and about 10 miles east of Tricca. Ithome has been sup-

posed to have occupied the site of the convents of Metoera: but it seems to have been farther south. Gochalia, a city celebrated in mythology, is coupled by Homer with Tricca and Ithome. Gonnus, or Goni, was a town of considerable importance and antiquity. It was situated on the left or north bank of the river Peneus, about 20 miles from the great city of Larissa, and close to the entrance of the gorge of Tempe. Gonocondyloan, a stronghold in the windings of the valley, was situated in the district above Gonnus, prob-

ably not far from the fortress of Roseni, on construction called Horsea-Castro. The Pelagonian Tripolis, also, a district which included the three towns of Pythium, Azoros, and Dolche, was situated in the north-east of Hestiaiotis, and is now called Perrhebians. Pellasgiotis was in the southern part of the lower valley of the Peneus, and includes the Pelasian plains which stretch from Larissa to Pheres, near Pelinna, having for its boundary the coast of the Peloponnesus. According to Strabo (ix. p. 441), this part of Thessaly was originally occupied by the Perrhebians, an antient tribe of apparently Pelasgic origin. It was however stated by them by the Lapithae, another Pelasgic nation, as having been founded by them. Perrhebians were ordered by Tribulus to retire northwards and across Pindus, and those who remained in the plains were incorporated with themselves, under the common name of Pelasgoi. The principal towns of Pellasgiotis were as follows:-Larissa was one of the most ancient towns of Thessaly, though not mentioned by Homer; it was situated in the most fertile part of the old country of the Perrhebians. The constitution of the city was democratical, the magis-

trates being elected and removable by the people. In the Peloponnesian war, the Lariasans supported the Athenians against the Macedonians. The Alexiane, mentioned by Herodotus as princes of Thessaly at the time of Pherseas, was placed by Strabo (ix. p. 437) as the name of a princely family of Thessaly, and therefore they may be supposed to have been under a form of government in which the name of Cranon, though noticed by ancient authors, does not appear to have been known to Homer. (Strabo, i. 441.) Within its territory was the hill of Cynoscephalae or Dog's-Heads, where a victory was gained by the Romans over Pergamus in the B.C. 197, which separate the plain of Larissa from that of Pheneus. According to some authors, the Thessalian Dodona was also within the district of Scutoua. Pherseas was near the extremity of the lake Boeotiae. In the Peloponnesian war the Phereseans entered the Athenian service. This gives it a considerable territory; it is probable that they then had a republic of government. Subsequently Jason made himself master of Pherse, his native town, and was succeeded as authority by his brothers. In later times it fell into the hands of Alexander, who continued for eleven years as the scourge of his native city, and the whole of Thessaly, he was checked by the Thebans, under the command of Augustus, and the country till it was liberated by Philip of Macedon. (I.

dorus, xvi. 517.) After many changes of fortune, it was taken by the Romans under the consul Acius. L.

The city was afterwards sold by its citizens, perhaps in 441 B.C. to the Pontic king, and since that time under which it had laboured heavy taxation. In the Peloponnesian war, it was most fertile, and the suburbs were surrounded by gardens and walled en-

terprises. Its port was Pagasia, about 10 or 12 miles from the coast. With respect to its modern features, 'Pheres,' says Delos, 'has hardly preserved any traces of antiquity: a few ru-

nered blocks of stone and some Doric frustra are the only

antiquities remaining.' The fountain Hyperea, men-

tioned by Homer (Iliad, vi. 427), is in the suburbs of the modern town of Belatista, at the foot of the ancient Acrope-

lion, which is a small lake of about 100 yards in diameter, and with sand as clear as crystal, bubbles up out of the ground. The well of Gell adds, that it runs through a coffee-house, or kaf-

nakeos, from its romantic situation. It rises on one side: it is a considerable plain encircled by hills on the north, and terminated to the south by the lake Boeotiae, the most extensive in Thessaly, and included within the limits of Pelasgiotis. It was once so called, according to Strabo, from it having been first occupied by Thessalians, who came from Thebes, and inhabited the plains below the Boeotiae, having the district of Pelasgiotis on the east. From this district it was regained towards the south-east the city of Phae-

rus, celebrated for the battle of Pythagorus and Pompey and Caesar. It is situated not far from the junc-

tion of the Enipeus and the Apidaurus; and it was a city of great size and importance, though no mention is made

of it previous to the Persian invasion of Greece. During the Peloponnesian war, the Phaeacians generally favoured

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the Athenians. Xenophon (Hellenic, vi.) speaks of it as an indestructible city, but afterwards is taken by the hands of Jason, tyrant of Phere. There is a modern town called Phasarna not far from, if not on, the site of the old Phasarna; but there are only a few antiquities there. South-west of it there is a hill surrounded with antient walls, according to Homer (Theb., 480), Dolopiæ, the extremity of Pithiotis; but it does not follow that it was included in that district; nor are the Dolopians in early times ever mentioned as the vassals of the Thessalians. They occupied the extreme south-west angle of Thessaly, formed an important part of the Amphictyonic council. At a later period Gell, Jason, and Tympheus (Xenophon, Hel., vi.) Afterwards the possession of Dolopia was frequently contested between the Αἰτωλικαὶ and the kings of Macedon, but it was finally conquered by Perseus, the last king of that country. The limits of Dolopia were different at different times. Thucydides (i. 102) seems to have extended it to the west of Pindus. It was a rugged mountainous district, with few towns of note. Cteneme or Cteneme, was perhaps the most important.

Phasæa, according to Strabo, included all the southern part of Thessaly, stretching lengthwise from the Malian Gulf on the east to Dolicopæa and Pindus on the west, and in breadth from Mount Οίτη on the south as far as Phasæa and the Thessalian plain on the north, an average distance of about 30 miles. The Ρηγαϊκαὶ, inhabitants within this limit, were supposed to be of Phthia and Hellas properly so called, and the dominions of Achilles. Its inhabitants were the Achæans (Ἀχαιοὶ Περιοβοι), a double name under which they were generally enumerated in the lists of the Amphictyonic states, as appearing in Homer (II. xiii. 1), and in the Alos, on the west side of the Gulf of Pagus, usually called the Phthiotic or Achæian, to distinguish it from a city of the same name in Locres. It contained a temple sacred to Jupiter Phthioticus, which was visited by Xerxes and his army, and to its north, or at the entrance, were thought to be still existing. Iton, about six miles west of Halæs, on the river Curias (Strabo), celebrated for a temple of Minerva Itonia, who was worshipped under the same name in Boiotia. The Thebæans, on their march through Phthia, were expelled by the Thessalians, is by some supposed to have been near these towns and on the shores of the Pagusam bay; but Müller (Dorians, ii. 475) adduces satisfactory reasons for believing that the Arne, which the Thessalians first occupied, lay to the north-west in Thessaliotis, and that it was identical with the antient Pierium. North of Halæs and Iton lay Thebeæ, the most important town of this part of Thessaly. It was called Phthiotic, to distinguish it from the Theban of an amount of importance that is greater than that of Magnesia and the upper parts of Thessaly. It was once in the occupation of the Αἰτωλικαὶ, but was wrested from them by the Thessalians, who held the Amphictyonic lists of the town. According to Livy (xviii. 25) it was once a city of great commercial importance. Some ruins between the modern towns of Armido and Volo are supposed by Sir W. Gell to be those of Thebeæ. They consist of an Acropolis, with very antient walls constructed with very large blocks; some towers also are still standing. The port of Thebeæ appears to have been Pyræus, about two miles and a half distant. A little south of Thebeæ was Larissæ Crameste, or Larissæ, Harping, so called from a fancied position on a hill; it was also called the Pelasgian. It lay in the dominions of Achilles, whence he is called Larissæus by Virgil (Aenid, ii. 198). The ruins of it still exist, and Sir W. Gell says of it, 'The form of Larissæ, like that of Anticyra, had the appearance of a triangle, with its citadel at the highest point. In the Acropolis are the fragments of a Doric temple; and from it is seen the magnificent prospect of the Malian Gulf, the whole range of Οίτη, and farther Parnassus.' Melitus was situated at the foot of Mount Otères, by the river Empeus. Its antient name was Pyrrha, and it boasted of possessing the tomb of Hellen, the son of Deucalion. It was about a whole day's march from Phasæa (Thucyd., iv. 78.). It was frequented by the Thracians, and was probably the chief city of the Illyrigae or Egnatians, or the Thracian settlements. The town was surrounded with a wall, and its principal entrance was by a gate on the side of the Egnatian road, said to be the nearest to the town. In ancient times there were almost the same condition as at the present day. The sea is very extensive, and the town is open on an immense plain like a vast sea, which stretches below as far as the eye can reach.' Dodwell says of it, 'It is about five hours from Pharsæa. It must always have been a place of importance. The view from it is one of the most wonderful and extensive I ever beheld.'

On the west of Pithiotis, and close to it, but still separated from it, lay the territories of the Dolopians. Aristotle (Pind., 255) calls it (κτησίματα τοῦ Πιθιότου) the possession of Sir (Strabo, i. 3, p. 434). Sir W. Gell observed between Pharsæa and Thaumakhe they were on the one side, and other Dolopians on the other. They were a very antient nation, as appears from their sending deputies to the Amphictyonic council. At a later period Sir, Jason, and Tympheus (Xenophon, Hel., vi.) Afterwards the possession of Dolopia was frequently contested between the Αἰτωλικαὶ and the kings of Macedon, but it was finally conquered by Perseus, the last king of that country. The limits of Dolopia were different at different times. Thucydides (i. 102) seems to have extended it to the west of Pindus. It was a rugged mountainous district, with few towns of note. Cteneme or Cteneme, was perhaps the most important.

The Malians, or Meles, as they were called in the Attic dialect, were the most southern tribe connected with Thessaly. They occupied principally the shores of the Malian Gulf (the Bay of Zéuton), from the Pass of Thermopylae on the south to the northern boundary of the valley of the Spercheus. Their country is generally flat; the plains in some parts are extensive, in others narrow, where they are confined on one side by the shores of the Malian Gulf, and on the other by the mountains of Trachinia. Thucydides divides them into three tribes, the Parali or Shore-men, the Hiereenses or Saceotdali, and the Trachinians. The second of these classes probably dwelt at Trachis at the mouth of the Parnassian river, on the rocky declivities of Mount Οίτη. They were always a warlike people, and those persons only who had served as heavy-armed soldiers were admitted to a share in the government. (Aristot. Rhet., Polit., iv. 1.) After this a confederacy was held in their country, and the Malians are included in the lists of the Amphictyonic states. They always maintained friendly relations with the Dorians of Lacedæmon. The principal towns of the Malians were as follows:—Anticyra, at the foot of Mount Οίτη; it was said to produce the genuine hellobeorë, considered by the ancients as a cure for insanity. Lamos, four or five miles north of Anticyra: it was celebrated as the scene of the Laminian war, carried on between the Thessalians and the Macedonians under Anti- pater. It is generally supposed to have occupied the site of the modern Zéuton, Trachis, or Trachin (the 'rough'), was so called from the mountainous character of the surrounding country: it was once the capital of the Trachians, who were in such close alliance with the Dorians that Diodorus (xii. 59) speaks of Trachis as the mother-town of Lacedæmon. The friendship between Ceyx, a Trachian hero, and Hercules, together or alone, is the mythological explanation for this connection. In later times Heraclea was the most important town of Trachinia. It was a colony from Lacedæmon, founded (a.c. 425) at the request of the Trachinians, about three miles from the sea and of a shape in which it was to gain additional strength against the Αἰτωλικαὶ, or Οίτη, with whom they were at war; there was also an old eminity between the Οίτη and the Lacedæmonians.
who were on this account the more readily induced to found the colony. It soon became an object of jealousy with the other Thessalian tribes, who frequently harassed it, and the Macedonians often sent reinforcements to support it. It was surrounded by Jason of Phere, who caused the walls to be pulled down; but it again became a flourishing city under the Antiochenes, who sometimes held the general council of their nation there. It sustained a long siege from the Roman consul, which was defended only by one man, Strabo, at Thermopylae (n.c. 191). The surrounding country was marshy and woody, but the vestiges of the city itself, according to Sir W. Gell, are observable on a high flat on the roots of Mount Eta. On the coast to the north of it is the smrity of Amphithous, a defile known by the name of Thermopylae (n.c. 191). The road which led through Themessaly to this Pythian was called the Via Pythia; and, as Pouqueville states, the shrine of Apollo may have been succeeded by a chapel dedicated to the prophet Elias. The defile is still more frequented by travellers going to Larissa from the north-western parts of Macedonia. Mount Olympus itself is one of the most celebrated mountains of Greece; especially in mythology, the stories of the gods represented it as the seat of the habitation of the Gods, where Jupiter sat and thundered in cloud and mist from the eyes of mortality. It divides the north-east of Thessaly, or Perrhebennas, from Epirus, the extremity of Macedonia on the south-east coast, into the height of Meliboea, and the higher part of Magnesia, and it is scarcely ever entirely free from snow. The part of the Cambodian range which lies to the west of Olympus was called Mount Titha, an outlier or limb of which, Mount Pindus, is still more remarkable. Mount Pindus, the western boundary of Thessaly, was part of the range of mountains which issues from the Thracian Sconamus, and forms what may be called the Greek Apennines. On the north it joins the Etylans and Macedonian ranges. On the south it is connected with the branches of Cita and the Antiochenes and Acarnaean mountains. It separates the waters which fall into the Isthian and the Ambracian Gulf (now the Gulf of Aetna), from those which empty themselves into the northern part of the Ionian Sea and the southern part of the Adriatic. Themessaly extends Epirus and Pecus, formerly far not far from the modern town of Metzovo. One of the highest points of Mount Pindus was to be found in the Tymbreus, forming its southern extremity, from which branched the ridge of Mount Othrys, closing the east end of Thessaly on the south, and separating the waters which flow into the Peneus from those which run into the southern Spercheian. Its eastern extremity separates the Gulf of the Isthmus from the Gulf of Corinth (now the Gulf of Aetna), which, as Pouqueville has observed, is due to the sea, which it meets at the Pass of Thermopylae; it forms the inner barrier of Greece, as the Cambodian range does the outer, to which it is nearly parallel in direction and equal in height. On the west it branches into the country of the Doriains and into Epeiros. On the south-east, beginning from Mount Calidromus, the highest summit of the range, it continued without interruption along the coast of the Euboean Sea, till it sinks into the valley of the river Pindus. By means of another branch to the south-west, it is connected with Parnassus, and after skirting the Corinthian Gulf under the names of Cirrbs and Helicon, it forms the northern boundary of Attica under the names of Cithernon and Parnes.

The Cambonian range was a branch from Mount Pindus running in a direction nearly at right angles to it, and separating Thessaly from Macedonia. Herodotus includes his chief mountain under and mentions the name of Thermopylae as the road between the two countries over the mountain pass by the Pass of Volustain, marked in modern maps as Pythia. Another important defile, leading from Thermessaly into Macedonia, passed by Pythium, a village with a temple of Ceres, and close to the highest summit of Olympus, on the north-east extremity of the range.

Through this latter defile many armies marched as antient times. Thus Xerxes is said by Herodotus (v. 132) to have crossed over Mount Olympus from Upper Epirus into the district of the Peloponnese. The road which led through Themessaly to this Pythian was called the Via Pythia; and, as Pouqueville states, the shrine of Apollo may have been succeeded by a chapel dedicated to the prophet Elias. The defile is still more frequented by travellers going to Larissa from the north-western parts of Macedonia. Mount Olympus itself is one of the most celebrated mountains of Greece; especially in mythology, the stories of the gods represented it as the seat of the habitation of the Gods, where Jupiter sat and thundered in cloud and mist from the eyes of mortality. It divides the north-east of Thessaly, or Perrhebennas, from Epirus, the extremity of Macedonia on the south-east coast, into the height of Meliboea, and the higher part of Magnesia, and it is scarcely ever entirely free from snow. The part of the Cambodian range which lies to the west of Olympus was called Mount Titha, an outlier or limb of which, Mount Pindus, is still more remarkable. Mount Pindus, the western boundary of Thessaly, was part of the range of mountains which issues from the Thracian Sconamus, and forms what may be called the Greek Apennines. On the north it joins the Etylans and Macedonian ranges. On the south it is connected with the branches of Cita and the Antiochenes and Acarnaean mountains. It separates the waters which fall into the Isthian and the Ambracian Gulf (now the Gulf of Aetna), from those which empty themselves into the northern part of the Ionian Sea and the southern part of the Adriatic. Themessaly extends Epirus and Pecus, formerly far not far from the modern town of Metzovo. One of the highest points of Mount Pindus was to be found in the Tymbreus, forming its southern extremity, from which branched the ridge of Mount Othrys, closing the east end of Thessaly on the south, and separating the waters which flow into the Peneus from those which run into the southern Spercheian. Its eastern extremity separates the Gulf of the Isthmus from the Gulf of Corinth (now the Gulf of Aetna), which, as Pouqueville has observed, is due to the sea, which it meets at the Pass of Thermopylae; it forms the inner barrier of Greece, as the Cambodian range does the outer, to which it is nearly parallel in direction and equal in height. On the west it branches into the country of the Doriains and into Epeiros. On the south-east, beginning from Mount Calidromus, the highest summit of the range, it continued without interruption along the coast of the Euboean Sea, till it sinks into the valley of the river Pindus. By means of another branch to the south-west, it is connected with Parnassus, and after skirting the Corinthian Gulf under the names of Cirrbs and Helicon, it forms the northern boundary of Attica under the names of Cithernon and Parnes.
The two principal rivers of Thessaly into which the smaller streams fall are the Peneus and the Spercheius. The Peneus rises in the Thessalian under Pindus, between the lower ridges of which it expands and, as it proceeds, it causes the Cambunian range its upper valleys are confined. Near Meteora, not far from the rocky Ithome of Homer, its basin opens somewhat towards the south. At Tricca it makes a turn towards the east, the sandy cheeks of the river towards the south-east, on the right of the river, though it is still confined by the hills on the left, till within about 10 miles from Larissa, where there is a considerable flat on the north, the soil of which is said to be alluvial. At Larissa, however, it is divided into several streams passing along the Vale of Temp, the only outlet for the waters of Thessaly, it empties itself into the Ægean Sea. Though fed by the most considerable rivers of Thessaly, it is a very small stream, and generally sluggish and shallow, except after the melting of the snows, when it sometimes floods the surrounding plains. The Marsh or Lake Nesonis, on the road between Larissa and Gonnis, is said to be caused by the floods of the river. The principal tributaries of the Peneus are the Saranta Poros. It is said to rise in Mount Titans, a part of the Cambunian range, and it joins the Peneus a little above the Vale of Temp. The waters of the two rivers did not however mingle; those of the Titanesus being carried towards the east passed along the Peneus itself floated like oil on the surface. (Strabo, i. p. 441.) This river was also called the Eurotas, and supposed to be a branch of the Styx, one of the rivers of the Infernal Regions. At the present day the inhabitants of its banks are remarkable for their healthy complexion, while the Peneus is surrounded by a sickly population. Its waters also are said to be clear and dark-coloured, while those of the Peneus are muddy and white. (Muller, Doriiana, b. i., c. 1, s. 6.) On the left bank of the river till it rises at Thessalonic the Peneus is joined by the Axios. The principal of them were, the Panisus, the Onchoenus, the Enipeus, and the Apidanus. The Panisus joins the Peneus to the east of Tricca, and is probably the modern Panari. The Enipeus, rising in Mount Othrys, flowed from the south-west of Phthiotis and fell into the Apidanus. It is now called the river of Goura. The Apidanus is now the Vlacho Iani. Herodotus describes it as one of the largest rivers of Achaia, but still inadequate to the supply of the Persian army with water. The principal river of Thessaly was the Spercheius, now the Hellidta. It flows from Tymphrestus, a branch of Pindus, and after winding through a long narrow vale between the ridges of Othrys and Bota, it falls into the Malic Gulf. The Spercheius is described by Homer; and the Spercheus, as noted by the Greeks, is a unique river. The resistance of this at the time of the Persian war, when the Thessalian house of the Aleuada, the princes of Larissa (Herodotus, vi. 6, calls them kings of Thessaly), either because they thought their power insecure, or with a view to increase it by becoming vassals of the Persian king, invited Xerxes to the conquest of Greece. That the Thessalian nation was in general opposed to their schemes appears from the fact that the Thessalians applied to the other states of Greece for assistance against Xerxes, and wished them, if possible, to be connected with him at the Pass of Tempe. The confederate Greeks did not think it expedient to do this, believing it impossible to make any effectual resistance to the north of Thessaly, being the places of the Thessalians, who were much farther off from their direct line of march. That occasion as far as Pharsalis; but he was checked in his progress by the Thessalians, who were superior in cavalry; and he was forced to retire, without having accomplished the objects of his expedition. When the war the Thessalians did not as a nation take any part, though several of the towns were in favour of the Athenians, between whom and the Thessalians there was an old alliance. It would seem moreover that the bias of the Thessalians was towards the Spartan general, was obliged to march through Thessaly (Thucyd., ii. 424) with secrecy and dispatch when traversing that country on his march towards Thrace. (Thucyd., iv. 78.) Not long afterwards, some troops of the Lacedaemonians, who had been sent by the Spartan general to reinforce their army in that quarter, were so vigorously opposed by the Thessalians,
that they were compelled to return home without having reached their destination. In B.C. 304 the Thessalians, who laid claim to the Boeotian cities, had formed a hostile confederacy against Sparta. The Spartans thought it necessary to recall from Asia their great commander Agesilaus, and on his way home he had to march through Thessaly. The Thessalians, with their cavalry, the best equipped army in the world, followed him to harass him on his march. His skilful manoeuvres however thwarted their designs, and Agesilaus gained considerable credit by defeating on their own ground, with horsemen of his own training, the most renowned cavalry of Greece. But while Sparta was struggling against the coalition of which Thebes was the head, Thessaly was assuming a new position among the states of Greece. To explain this we must observe, that though a kind of political and national unity was still preserved among them, the spirit of the two states, still, the country had very seldom been united under one government. A few great families, such as the Scopades and the Aleuadæ, were sometimes able to extend their influence even beyond the cities of Larisa, Crannon, and Pharsalus, about which their possessions lay. Occasionally one of them was raised to the dignity of Tagus; but their power was always liable to be overthrown, even in their own cities. Towards the close and after the end of the war, many of the cities acknowledged the ascendency of Pharsalus or Phere, the latter of which was, about B.C. 400, under the dominion of Lycophon. This prince endeavoured to extend his power over all Thessaly; and Xenophon (Hellen. ii. 4) mentions a very considerable revolt of the cities of the Thessalian states and of the Peloponnesus in one of the events which happened in the year of the fall of Athens (B.C. 404); but he does not state what were the results of it. Ten years afterwards Lycophon was still engaged in a contest with Larisa, then subjugated, Medius, who was probably one of the Aleuadæ. Lycophon was supported by Sparta, and Medius by the Boeotian confederacy, by the assistance received from which he was enabled to make himself master of Pharsalus, and then occupy the Eubæan garrison.

The success of Agesilaus on his return from Asia produced some change in the affairs of Thessaly, for Pharsalus soon recovered its independence, and rose to such eminence as to become a rival of Phere. It did not however continue, as of old, under the power of the Scopades: it was divided between contending factions, which, for the sake of peace, agreed to place themselves under the power of a person named Polydamas, whose character and virtue had gained the confidence of all parties. (Thirwall, Hist. of Greece, vol. v., p. 56.) Polydamas was accordingly entrusted with the citadel and the administration of the revenues of the city, a trust which he discharged with the strictest integrity.

At Phere the supreme power passed into the hands of Jason, who was probably the son of Lycophon, and certainly the inheritor of his ambitious views, which however he enlarged into more comprehensive schemes, and, with superior talents, put them to greater means of realizing. He kept a standing army of 1500 mercenaries, all picked men; and, notwithstanding the opposition of Pharsalus, he compelled most of the principal Thessalian cities to enter into alliance with him: moreover, his sway was acknowledged by several of the neighbouring tribes. The leading states of Greece were wasting their strength in a protracted warfare, and whichever way he turned his eyes he perceived, or imagined that he perceived, facilities for the aggrandizement of his authority. He accordingly made the project of a huge undertaking. He assembled the forces of the East; the same schemes in fact as were subsequently executed by Alexander, king of Macedon. The first objects which he had to gain were the title of Tagus, and the union of Thessaly under his authority. To accom-

To the pursuit of the Persian empire in the East; the same schemes in fact as were subsequently executed by Alexander, king of Macedon. The first objects which he had to gain were the title of Tagus, and the union of Thessaly under his authority. To accom-

plish the latter project it was necessary to gain by per-

suasion, or overpower by force, Polydamas, the governor of Pharsalus. Jason adopted the former method, and, as he had the credit of his success, prevailed upon Poly-

damas to second him. A conference was there-
The first battle, in which however Alexander was defeated. The campaign ended in the tyrant being obliged to resign his conquests, withdraw his troops from Phthiotis and Magnesia, and enter into alliance with Thebes. Still Alexander did not cease to be an object of hatred and dread to his subjects. The latter, in their fear and propagand at last his wife Thebe conspired with her relatives and other Thessalians to murder him. (Mach. 359.) They effected their purpose, and one of them, Tiasponus, under the direction and with the sanction of Thebe, assumed the government. But his return ten years afterwards (Suppl. p. 333), we find Lycochron, another of the brothers, at the head of affairs. The new dynasty however seems to have been as unpopular with the Thessalians as the old one, and according to Lycophron, at their head, they applied to Philip, King of Macedonia, and, finding him at the moment displeased with Lycochron applied to his allies, the Phocians, the antient enemies of the Thessalians, at that time under the command of Onomarchus. Philip invaded Thessaly, and, after gaining some success, was obliged to retire; but he shortly afterwards returned at the head of a large army, and made himself master of the whole country, Lycochron withdrawing into Phocis. Philip wished to be considered as a liberator, and accordingly he restored popular government in Thessaly, and consecrated the son of its port Pagasa, and garrisoned Magnesia with his own troops. The important services which he thus rendered to the Thessalians secured their attachment to his successors, and the Pelidians or Boeotians, for the inferiority of gaining a strong footing in the country, of which he did not fail to avail himself. It would appear however (Thirlwall, Hist. of Greece, vol. vi., p. 12) that about b.c. 344, either the tyrants of Pherae or their party there had regained to their ancient order, of things in Thessaly. This seems to dislodge them. He took effect with ease, and then availed himself of the opportunity to make Thessaly entirely subservient to his interests, and in fact to render it the province of Macedonia. After expelling the dynasty of the tyrants, he garrisoned the citadel of Pherae with his own troops, to prevent, as he gave it out, any chance of their restoration to power. He also strengthened his own authority by effecting what was professedly a return to the ancient freedom of the Thessalians. This was the revival of the tetrarchies as political divisions of the country, for though this antient division into four districts still subsisted, it had long been rather a geographical than a political arrangement. At the head of the four governments he placed his devoted adherents, the chiefs of the Aeolean party, so that they were in reality his viceroys or deputees. The result is described by Demostenes (Olynth., i. 23) as amounting to a total subjection of the Thessalians, for Philip had taken the whole of the numerous troops; besides which, he not only received the harbour duties and customs of the country, but also appropriated to himself the tribute which had always been paid to Larissa by her subject Perioetian cantons. (Strabo, ix. p. 472.) His authority was further strengthened by a decree confirming to his son Alexander the supreme station which Philip had held in their councils, and also signified their intention of supporting his claim to the title of commander-in-chief of the whole Grecian confederacy. Immediately after the death of Alexander (suppl. 323), a confederacy was formed against the Macedonians by the Athenians and other states of Greece, which the Thessalians were induced to join. Antipater, the viceroy of Macedon in Thessaly, took the town of Pherae, which was too large to cope with the confederacy, and after a battle, in which some Thessalians deserted him and caused his defeat, he retired to Lamia, a town of Thessaly, where he was besieged for some time by Leoschines, the Athenian general. The siege was however raised by Leonatus, an eminent Macedonian general, and some additional reinforcement under Craterus enabled him to bring to a successful issue what was called the Lamanian war, in which the Macedonians won the whole of Thessaly, which nearly proved fatal to the Macedonian influence not only in Thessaly, but over the whole continent of Greece. Thessaly was thus preserved to the Macedonian crown till the reign of Philip, son of Demetrius, from whom it was taken by Lysimachus (see supra, p. 317). All Thessaly was then declared free (Liv., xxxii. 32) by a decree of the Roman senate and people, but from that time it may be considered as under the dominion of Rome, though its conquest was disputed by Ariobarzus (Liv., xxxvi. 31), and again by Philip, between whom and the Romans it was the arena of more than one conflict. It was already a Roman province when the fate of the empire of the universe was decided by the battle between Pompey and Caesar on the plains of Pharsalos.

The slave-merchants of Greece were generally Thessalians. (Aristophanes, Plutus, 517.) Their chief slave-market was Pagasa, the port of Pherae.

C. d. i. Clarke, Dodsley's Travels; Leake's Travels in Northern Greece; Thirlwall, History of Greece; Cramer, Ancient Greece, vol. iii., p. 343.; Wachsmuth, Hellenische Alterthumskunde, vol. i., p. 65.)

THETFORD, a small parliamentary borough, parish in the hundred of Oxhey, and Bury St. Edmunds, and 30 miles from Norwich by Attleburgh. It has been confidently asserted that Thetford existed in the time of the Romans, or even antecedent to their arrival; but it cannot be identified with any of their towns that have been mentioned in antient records. Plot and Blomefield attempted to show that the name of the 'Antique Itinerary;' others have proposed to fix here the Icician of the 'Itinerary,' but without any solid ground for their opinion. The Ikenfield or Icknield Street or Way, and a road called the great road or 'designated road' by Plutus, seems to have passed near Thetford, but not very near it. Blomefield describes some traces of fortifications as existing in his time, but it is not clear that they were Roman. Some coins of the earlier emperors, from Claudius to Antoninus Pius, have been found near Thetford. Under the kings of the Saxon race it was a mere market-town; a synod was held here a.d. 669. When the Danes invaded England in the reign of Ethelred I., they fixed their head-quarters, a.d. 870, at Thetford (called in the Saxon Chronicle, Thexford, Thetford, and Thetford). They made the town their headquarters, and by other means, including the capture of Thetford and Thetford), which they sacked: and it is likely that the battle in which they defeated Edmund, king of the East Angles, was fought not far off. There appears to have been an abbey near the town at an early period, for King Alfred, the grandson of Alfred the Great (a.d. 952), 'ordered a great slaughter to be made in the town of Theotforda, in revenge of the abbot, whom they had formerly slain.' (Saxon Chronicle; Florence of Worcester.) In the reign of Ethelred II. the town was burnt by the Danes (a.d. 1044) under Sweyne, but on their return to their ships they were intercepted by the Anglo-Saxons under Ulfyke, and did not make good their retreat without serious loss. They returned to the town (a.d. 1094) with the army of the East Angles was transferred from North Elmham to Thetford, but remained there not twenty years, being transferred (a.d. 1094) to Norwich. At this time Thetford was a town of considerable size and importance; it was the residence of the bishop, and possessed a large borough, in the place of the Confessor; but at the time of the Domesday Survey there were only 720 burgesses, 224 houses being unbahited. It gave name to the hundred in which it stood. After the removal of the bishopric to Norwich, or perhaps before, a Cluniac priory was founded here, the revenues of which at the dissolution were 418l. 6s. 3d. gross, or 3125. 145. 4d. clear. There was also a house of canons, which was afterwards a nunnery, a Dominican friary, and a hospital. The town was situate on the bank of the river Great Ouse, and the seat of one of the suffragan bishoprics established by Henry VIII. There have been as many as twenty churches; thirteen are mentioned in Domesday.

The borough of Thetford, according to the Population Returns for 1831, comprehends three parishes, with an area of 9870 acres, and a population of 3462. The parishes of St. Cuthbert and St. Mary are very much intermingled, and are partly in Suffolk and partly in Norfolk: the third parish of St. Michael's, is built, and is neither paved, watched, nor lighted, and clean apparatuses for the trade of the place is not carried on, but the trade of the place is favoured by the river being navigable up to the town, by means of which an export of agricultural produce and

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an import of coal are carried on. St. Peter's church consists of a nave with two aisles, chancel, and a tower. The church and tower are perpendicularly built chiefly of flint, whence it has obtained the name of 'the black church.' St. Cuthbert's church is of ordinary structure: it has an embattled tower. Both these churches are in Norfolk. St. Mary's church is on the south side of the town, and is merely built. There are meeting-houses for Wesleyans, Independents, and Quakers; and a Roman Catholic church. Considerable remains of the Cluniac priory, especially the ancient gateway, still exist on the north-west side of the town. In the north of the town remains of an old nunnery, comprehending the chapel and the ruins of some other parts, at what is called Thetford-place Farm, on the Suffolk side of the river, south of the town; and some relics of the structures of the middle ages. The grammar-school is an ancient building.

The borough, as we have seen, is as old as the time of Edward the Confessor: under the Municipal Reform Act it has four aldermen and twelve councillors, but is not to have a commission of the peace, except on petition and grant. It first sent members to parliament in the time of Edward VI., and still returns two: the borough limits were not altered by the Boundary Act. There were 156 voters in 1833-4, and 160 in 1839.

The borough consists of St. Mary and St. Peter. St. Peter's comprises, of the clear yearly value of 83l. and 55l. respectively; that of St. Cuthbert is a perpetual curacy, of the clear yearly value of 50l.: all are in the rural deanery of Thetford, and the ancient grammar-school of Norfolk. The borough in 1833, thirteen day-schools, with from 307 to 307 scholars, namely, 123 boys, 69 to 79 girls, and 165 children of sex not stated; and three Sunday-schools, with 393 scholars, namely, 160 boys and 233 girls.

BLOOMFIELD, CUTHBERT, MARTIN, History of Thetford; Parliamentary Papers.

THETIS, Mr. Sowerby's name for a genus of fossil shells, said to resemble Mariva, but not to have the internal alignment. It is described as having several small acuminate teeth, but not lateral teeth; so that it in some degree resembles Tellima without the posterior plication.

THEVENOT, MELCHISEDEC, is said by all his biographers to have died at the age of 71; and as his death happened in 1692, this places his birth in the year 1621. An entry in the printed catalogue of Thévenot's library informs us that he was uncle of the traveller Jean Thévenot, but beyond this we know nothing of his family or circumstances. It is implied however, from the respectable missions to which he was appointed at an early age, from the large library he collected, and from his being able to devote himself to literary pursuits while apparently in the receipt of no pension, that his family was wealthy and distinguished.

It is stated that in his youth he visited several countries of Europe, but the earliest incidents of his life concerning which we have positive and authentic accounts are those mentioned in the brief autobiographical sketch prefixed to the printed catalogue of his library. He tells us that on his return from travelling in 1647, he was nominated resident at Genoa, but that the troubles of the Prone interfering to prevent his taking possession of the post, he continued to follow the court till 1651. He was then sent to Rome, where he continued nearly three years; and being there at the commencement of the concilae which elected Alexander VII., the royal instructions respecting the part France intended to take on that occasion were addressed to him. At Rome, in May 1655, he alludes in mysterious phrase to a delicate and dangerous commission with which he was instructed after the termination of the concilae, which he says discharged to the perfect satisfaction of the king, and the other ministers. He attended Mazarin during the campaign in Flanders, 1655.

On his return to Paris, Thévenot devoted himself entirely to study. Frenicle, a mathematician, and Bienon, a numerous correspondence with him; and in the town he entertained a person to conduct chemical experiments. The meetings of scientific men which had been held in the houses of Père Mersenne and Montmort were transferred to Mazarin's mansion. The expenses thus incurred proved too heavy for his means; and he proposed to Colbert the establishment of a public and permanent association of scientific men under the patronage of the king. The suggestion accorded with the minister's views, and the Academy of Sciences, as it was styled, was formed to embrace every branch of knowledge. The king's library was to be the place of meeting: the historians were to assemble there on the Mondays and Thursdays of every week; the amateurs of the belles-lettres on the Tuesdays; the mathematicians and philosophers on the Wednesdays and Saturdays; and general assemblies of all the three classes were to be held on the first Thursday of every month. The historical class was allowed to drop, it being feared that its questions were too difficult.

The Academy was founded, instituted by Richelieu, remonstrated against the foundation of another literary academy; and the only part of Colbert's plan that was realised was the Academy of Sciences. It was established on June 1666. Thévenot did not become a member of the Academy till 1685.

He had in the mean time however been diligently prosecuting his favourite studies. Each of our company, he says, had his task and occupation: mine was to collect and publish in French whatever useful arts were practised among other nations. About this time I invented an art, of which I caused the description to be printed, and it was not looked on as something new, but as something that had been yet been tried. To render geography more perfect, I collected and published three large volumes of a collection of voyages, upon which I had been working for some time. I had the honour to present them to the king, who examined all the parts, and after various questions, commanded me to continue the work. M. Colbert informed me that he had his majesty's orders to furnish me with everything necessary to carry out the design. A distribution of tasks took place about 1668 before the Academy had recorded any proceedings.

The first volume of Thévenot's Voyages was published at Paris, in 1662. The author's preface announces a translation of the Voyages and Travels published by Hakluyt, and Purchas, with the additions and corrections from the Oriental languages. The second volume appeared in 1664: the preface intimates that for the use of the numerous trading companies that have of late been formed in the kingdom, he has added an account of the present state of the Indies, pointing the principal commercial establishments and places of resort of the Dutch and Portuguese; a report from one of the factors of the Dutch East India Company to the directors; and an extract of a letter from the governor-general of the East India Company of France. The third volume was published in 1666, and the fourth in 1672. In the preface to the fourth volume Thévenot informs the reader that the constant discovery of travels which had escaped his research, and which had not been inserted in his collection, so that all relating to one quarter of the world should appear together. These four volumes were in folio; and during the remainder of his life Thévenot published in the same form a number of separate accounts of voyages, which, logarithmically, left half printed at his death, were bulky enough to form a fifth volume. The edition of his collection printed after his death at Paris, in 1696, professes to contain all those annalas, but a complete edition would never be met with. In 1693 Thévenot published a small book in 12mo, entitled 'Receuil de Voyages de M. Thévenot.' It contains 'A Discourse on the Art of Navigation, with some Problems which may supply in part the deficiencies of this useful Art.' It is called the 'Receuil,' which is the French of the level above alluded to. The same volume contains an account of the museum of Swammerdam, with some memoirs by that naturalist, said on the special title-page to be 'Extracted, together with the travels which precede it, from the separate collections of the famous M. de Jussieu, and the house of M. Thévenot.' It will be advisable to conclude the narrative of Thévenot's life before attempting to pronounce judgment on the merits of his publications.
Thévenot, in addition to most European languages, was able to read Hebrew, Syriac, Arabic, Turkish, and Persian. He commenced a series of observations on the variation of the magnetic needle in 1663, and prosecuted them with great industry. For several years he made measurements of degrees of longitude along the Gulf of Bothnia: he invented his air level about 1660, and recommended its adoption to facilitate observations on the surface of the sea, and he endeavoured to discover a natural unit of linear measurement for all nations. He possessed however rather the taste than the talent for strict scientific observation and reasoning, and this peculiarity was the cause in the first place of his anxiety to have men of science for his habitual visitors, and of his eagerness to collect books of travels, printed or in MS., such works being calculated to gratify a mind which, without a capacity for severe labour, was fond of acquiring knowledge. In books of travels he found information regarding statistics, history, commerce, navigation, topography, languages, and all the branches of knowledge and appreciate their importance, though he could not task himself to master any one of them. He undertook to publish a systematic collection of voyages and travels, as the task best suited to his turn of mind; but even this required more continuous effort than he was capable of: in the fourth volume the systematic arrangement was abandoned, and only some fragments of the fifth part were published at long intervals. Thévenot was one of those who promote science by importing a contagious spirit of activity to others more than by anything they accomplish themselves. His taste for collecting books has been the means of supplying the king's library at Paris with some of its most valuable MSS., some of which have yet to be printed. Thévenot's industry has been the means of preserving some curious and valuable narratives. If he did not make a good practical librarian, he at least pointed out the way in which the library might be rendered more complete; and besides preserving materials for geographers to work upon, he directed attention to the means of rendering the science more perfect. Some of his suggestions mentioned above were not without their influence in promoting the applications of science as tied up with useful research; and he was the first, by directing attention to the line of communication between the Caspian and China, and to the literature of China, to commence that series of investigations which has been so brilliantly carried on by the French in the regions of Remusats and Klaproths of the past and present century.

From which this sketch has been compiled:—

1. Mémories sur la Collection des grands et petits Voyages, et sur la Collection des Voyages de l'Academie Thévenot,' par A. G. Camus, Paris, 1802, 4to. Owing to the incomplete condition of most copies of Thévenot's collection, this work is necessary to enable the reader to know what he has published. 2. 'Bibliotheca Thévenotiana sive Catalogus. I. Manuscriptorum in Bibliothecae viri clarissimi D. Molichesedici Thévenot,' Lutetiae Parisiorum, 1694, 12mo. This volume contains the autobiographical sketch above referred to: the catalogue of Thévenot's library, and light upon his studies. 3. 'Recueil de Voyages de M. Thévenot,' 8vo. Paris, 1688. This volume contains the discourse on navigation, in which there are some incidental notices of Thévenot's pursuits. 4. 'Relations de divers Voyages curieux qui n'ont jamais été publiés,' 8vo. Paris, 1690, 1691. 5. 'Le Long et Fontette: 'Bibliotheca Historique de la France.'

THEVENOT, JEAN, was born at Paris the 7th of June, 1633. In the dedication of the first volume of his travels to his mother, he attributes to her exclusively the great care bestowed upon his education; and from this circumstance it may be inferred that his father died while he was a child. Thévenot distinguished himself as a student at the college of Nivars. The author of the sketch of his life, praised for the volume of his travels, states that his attainments in the liberal sciences, geometry, astronomy, and all the mathematical sciences, were respectable, and that he had studied with particular attention the philosophy of Descartes. But it is doubtful whether all these are to be understood as having been his college studies.

He left the college of Nivars before he had completed his eighteenth year. Possessing an independent fortune, his attention was for some time afterwards engrossed by the many exercises which were then deemed indispensable accomplishments in a gentleman; but having contracted a taste for reading books of travels, he caught the contagious spirit of adventure, and commenced traveller himself in 1652. He visited in succession England, Holland, Germany, and Italy; and, making a prolonged stay at Rome (1654-55), witnessed the solemnities of the installation of Alexander VII. He had taken the pains to prepare an account of his observations during this tour, but the communication of this work to his friend, an account of his youth and partly on account of the want of novelty in the subject. At Rome he became acquainted with the celebrated Orientalist d'Herbelot, who, being a good many years his senior, and already distinguished for his learning, acquired considerable influence over him. D'Herbelot freely communicated to his young friend the information he had collected regarding the East and its inhabitants, and the result of their conversations was that Thévenot determined to devote himself to exploring Asia. D'Herbelot proposed at one time to accompany him, but being prevented by some family matters, Thévenot set out alone.

Thévenot began his first journey from Malta on the 1st of November, 1656. On his return to Malta, he was attacked by fever, which brought him to the brink of death; from 1678 till his death no important acquisitions had been made. Thévenot found the library extremely deficient in English, German, and Dutch works, and he obtained permission to make arrangements for procuring from those countries their historical memoirs. In 1688 he published his account of his travels, which he had written while at Rome, 1688, 4to. Owing to the incomplete condition of most copies of Thévenot's collection, this work is necessary to enable the reader to know what he has published.

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prepared for the press to gratify his friends, and especially his mother; and these were not with him mere words of course, for he was more intent upon travelling and observing than publishing. Before his book had passed through the press, with the previous a warning of his intention, he left Paris to renew his researches in the East, and sailed from Marseille on the 6th of November, 1683.

This time his object was to visit Persia and the Indies. He crossed the Suez in Alexandria on the 4th of February, 1664; from Alexandria he sailed a few days to Sidon; and from Sidon he visited Damascus. After a stay of twenty-four days in that city he went to Aleppo, where he remained three months, and then, having left his Bic, Orfa to Mosul, descended the Tigris to Bagdad. From Bagdad he traveled by way of Hamadan. Having remained five months at Isphan, he left it, in company with Tavernier, for Shiraz and Gomboon, intending to sail for India from that port, but the jealousy of the Dutch agents obliged him to return to Shiraz. After examining the ruins of Tabilminar (Persopolis) he proceeded to Baerah, and embarked at that port for Surat, where he arrived on the 12th of January, 1666. Sural continued his head-quarters till February, 1667, during which time he made excursions to Guzerat, the court of the Mogul, and to the Deccan. On his return to Persia he spent five months at Isphan. He had several attacks of the plague, having been exposed to the accidental discharge of one of his own pistols at Gomboon. His cure was tedious. His constitution was probably undermined, for, attacked by fever on his way from Isphan to Thevas, he landed in Basra, on the 8th of November, 1667. During this journey he had acquired a knowledge of the Persian language.

The narrative of Thévenot’s first journey to the East was prepared for the press by himself, but was not published till after his departure from Persia. The account of his travels in Persia, and that of his travels in India, were published (the former in 1674, the latter in 1664) by an editor who is called, in the ‘Privé du Roi,’ the Sieur Lœuillet. It states that he made some excursions, and employs expressions which would lead us to believe that he had married the traveller’s mother. The editing of these two volumes has been successfully performed.

Thévenot possessed a natural talent for observation, and the power of expressing himself accurately and unaffectedly. Nothing of importance appears to have escaped his notice: his manner of telling his story impresses the reader with a confidence in his good faith, and his statements have been corroborated on many material points. His mastery of the Persian and Arabic languages gave him an advantage that scarcely any other Oriental traveller of his day possessed. His ‘practice of residing for some time in the principal towns of the countries he visited’ (as he himself says) gave him a knowledge of the national character.

His descriptions of external objects are distinct, and his routes accurate. He had collected a Hortus Siccus in India, and had laid aside each specimen an account of the habits and characteristics of the plant, along with its name in the Portuguese, Persian, Malay, and (what his biographer terms) the Indian and Baniyan languages. This collection came into the possession of Melchisedec Thévenot, and is mentioned in the printed catalogue of his library. Jean Thévenot had also collected Persian and Arabic manuscripts, of which Tavernier says the cali of Miana kept the best to himself. The matured judgment, and talent for observation and description, in the press, Thévenot’s works, are astonishing in one who had been a wanderer from his twentieth year, and who died in his thirty-fourth. His travels, originally published in three volumes, in quarto, which appeared respectively in 1668, 1674, and 1684, were reprinted in 1688, and also made a collection, in 1688, and at the same place, in the same form, in 1705, 1725, and 1727. A Dutch translation of them was published in 1681, an English translation in 1687, and a German translation in 1705.

This sketch has been compiled from the account of Thévenot’s life prefixed to the second volume of his travels, from the travels themselves, and from some incidental notices in Tavernier.

THÉW, ROBERT, was the son of an innkeeper in the small town of Pettington, in the East Riding of Yorkshire, where he was born in the year 1756. His education was neglected, and at a suitable age he was bound apprentice to a cooper. After the expiration of his apprenticeship Théw continued for a time to work at the business till he was called on as a cooper in the American war of independence, where he served as a private in the Northumberland militia. According to the Gentleman’s Magazine, his attention was first directed to engraving about the age of twenty-six, when, through the influence of an engraver at Hull, he procured a copper plate, and engraved an old woman’s head, from a picture by Gainsborough, with such extraordinary skill that he was engaged by a subscriber on a large scale to engrave the copper-plate engraving. A more probable account is that about 1783 he settled at Hull, and became an engraver of shop-bills, cards, &c. Chalmers states that he engraved and published a plan of Hull, which was dated May 6, 1784; and that shortly afterwards he solicited subscriptions for two views of the dock at that place. The latter are large aquatint prints, drawn and engraved by Thew, with the assistance of F. Jukes in the aquatint department; and they were illustrated by cuts, after plates by Boydell. Copies of them are preserved in the collection of George III., now in the British Museum. In 1798 Thew was introduced to Alderman Boydell by the marquis of Claremont (afterwards duke of Leeds), whose patronage he had obtained in the construction of a new principle; and Boydell immediately commissioned him to engrave Northcote’s picture of the interview between the young princes, from ‘Richard III.,’ act iv., sc. 1. This plate was published as early as 1791, as well as a copy of the engravings done by Thew during his time the appointment alluded to, of engraver to the Prince of Wales. He subsequently engraved eighteen other plates for the Shakspeare Gallery, and part of a smalldoth of these are among the best in the collection. A number of them were engraved in very high degree as an unusual amount of spirit and expression. That of Cardinal Wolsey entering Leicester Abbey (‘Henry VIII.’, act iv., sc. 2), from a picture by Westall, is particularly and deservedly celebrated as a fine specimen of the style known among artists as stipple engraving; and in consequence of its superior beauty, proof-prints of it were, according to the Gentleman’s Magazine, charged double the price of any other in the whole work. There is in the collection a portrait of the king, at St. James’s, by Thew, after the ‘Gentleman’s Magazine’ in Hertfordshire.

THIA, Dr. Leach’s name for a genus of crustacea, genus of Milne Edwards under the tribe Coryphes in the family Oedonidae.

Generic Character. — Carapace nearly cordiform, a good deep brown narrowly, its upper surface very smooth, and nearly horizontal from before backwards, but much curved transversely, and presenting no distinct ridge. Front wide, lamellar, and rather advanced; the lateral borders of the carapace delicate and arched. Orbita very small. Internal antennae bent transversely under the front; external antennae inserted in the gap which separates the two, on the floor of the orbit, large and similarly faciliated. Disposition of the buccal apparatus nearly the same as in Atelocyclus, a genus which immediately precedes it in the arrangement of M. Milne Edwards. Third joint of the external antennae advancing to the base of the internal antenna, but much less elongated, and giving insertion to the succeeding joint by a large notch at its inner angle. Sternal plastron very narrow. Anterior feet short and compressed, but less than in Atelocyclus; but still short, straight and very sharp point. Abdomen nearly of the same form in both sexes; only that of the male is rather narrower, and the three joints which precede the last are angularly constricted. (M. E.)

Habit of the Genus. — This lives buried in the sand at a small distance from the shore. M. Milne Edwards states that but one species is known with any certainty, namely. —

This polita.—Colour rosy; length ten lines; localizes the British Channel and the Mediterranean.
M. Milne Edwards remarks that the aspect of these small crustacea is very peculiar, and approximates them a little to the Anurous section. In other respects, he observes, they bear a strong analogy to Atelecyclus, and, as well as that genus, establish a passage between the Oxytomes and the Cancorians.

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THIAN SHAN MOUNTAINS. [SONGARIA.]

THIAN SHAN NANLU is the name of a Chinese government formed between the Pass of Nanlu in Trans-Bokhara and the Northern Pass of the Tien Shan, and also Little Bucharistan. The name of Turkistan is applied to it because the bulk of the inhabitants in that part of Asia is composed of Turkish tribes; and as these tribes are frequently designated by the collective name of Bucharistan, from the town of Bokhara, Eastern Turkistan, is also called Little Bucharistan, or rather Bokhara, to distinguish it from Western or Proper Turkistan, which is called Bucharistan without any epithet. Thian Shan Nanlu, in Chinese, signifies the 'southern road of the Thian Shan Mountains,' and has been applied to the countries south of that mountain-system, because they are traversed by the southern of the two great commercial roads which connect China Proper with the countries of eastern Asia, whilst the countries north of the Thian Shan are traversed by the northern commercial road, and on that account are called Thian Shan Nelu, the northern road of the Thian Shan. The last-mentioned countries constitute the government of Khil, or Songaria. They have been described under SONGARIA.

Thian Shan Nanlu lies between 36° and 44° N. lat., and extends from 71° to 96° E. long. From west to east it extends about 1200 miles, and its width from north to south varies between 500 and 300 miles. Its area probably extends 500,000 square miles, so that it is ten times as large as England without Wales, and twice as large as France. It is mostly surrounded by countries belonging to the Chinese empire; on the north is Songaria, or Thian Shan Nelu, the eastern province of Kans, and south Tibet. Only its western side is enclosed by countries independent of China. On the south-west is Ladakh, on the west Kandush, including Bokhara, and on the north-west Khokan. The three last-mentioned countries are within Western Turkistan, or Great Bucharistan.

Thian Shan Nanlu is a country entirely isolated from the rest of the world. On the north, west, and south it is closed by mountain-ranges of such extent and elevation, that the places which are permanently inhabited can only be reached by passing for several days over mountains, which are not inhabited except for two or three months in the year, when they are visited by few families of wandering tribes of mountaineers. On the east of Thian Shan Nanlu is an extensive desert, which appears to be uninhabitable. The country enclosed by the three ranges and the desert receives an abundant supply of water from the mountains, a considerable portion of which is always covered with snow, and the numerous rivers which descend from them form a large river, called the Tarim, which Ritter compares with the Danube, but which does not reach the sea; it terminates in an extensive lake situated on the western edge of the desert. The basin of the river Tarim is the largest closed river-basin on the globe, if that of the Caspian Sea and the rivers falling into it is excepted.

Mountains.—At the south-western angle of Thian Shan Nanlu stands an extensive mountain-knot, called Pushitkhir, which occupies the space between 36° and 37° N. lat., and between 71° and 74° E. long. From its western side issues that elevated chain which is known in Afghanistan by the name of Hindu Kush; from its north extends another range, called the Taratashling, or Bolor Tagh, which extends northward; and in the eastern part there begins a third range, which traverses the whole of Central Asia, and extends through China Proper to the shores of the Pacific. This last-mentioned range is called by the Chinese, Shanlun, but that portion of it which is contiguous to the mountain-knot of Pushitkhir goes by the name of Thasungling.

The Kuenlun range may be considered as that portion of the Kuenlun range which extends from the Pushitkhir on the west (72° E. long.) to the mountain-pass of Karakorum on the east (between 76° and 77° E. long.), and occupies nearly the whole of the space between 38° and 37° N. lat. Very little is known of this mountain-region, which, however, may surprise us, when we learn that, according to an intelligent Mohammedan traveller, an eternal mass of snow occurs in these parts, which occupies 200 cos (equal to more than 500 English miles) in length. An extraordinary phenomenon is stated to occur on the northern declivity of the mountains, where the Thasungling and Pushitkhir are contiguous—the continuance of rain for three successive months. That portion of the Kuenlun range which is bounded on the north by the same name and on the south as the Keriya Pass (84° E. long.) its snow-covered summits lower towards the north with a moderate descent, and a hilly tract of moderate width extends along their base, which is fertilized by the rivers descending from the mountains; but east of this range, there is a low tract found along the base, which leads to the supposition that the declivities of the mountains are extremely steep, and that they are in immediate contact with the sandy desert which extends north of the Keriya Pass. Two roads traversed the range. The most western leads through the Karakorum Pass from Hindustan and Cashmir by the way of Leh in Ladakh, to Khoten in Thian Shan Nanlu. The road runs from Leh north-eastwards over a mountain-chain, and descends to the valley of the river Shuyuk, the course of which it follows upwards between the mountain-masses of the Kuenlun nearly to the source of the river. It passes by a narrow valley over the highest part of the mountains (between 36° and 36° 30'), and descends on the north into the valley of the river Mizar, which is a tributary of the Tarim. In the narrow valley of the Mizar the road runs to Khelasten (north of 37° N. lat.), where the mountains disappear, and cultivation begins to be general. This mountain-road certainly does not rise to such an elevation as those which traverse the Himalayas Mountains, for it is quite free from snow in summer, and, with the exception of the highest portion, it does not rise above the line of vegetation, or even that of trees, as may be inferred from the fact that firewood and fodder for beasts of burden are generally abundant, and permanent habitations are met with in the valleys of the Shuyuk and Mizar up to the immediate vicinity of the mountain-pass. The highest part of the pass probably does not exceed 12,000 feet above sea-level. This road however is much more frequented in winter than in summer, because the melting of the snow on the mountains adjacent to the road renders travelling in summer almost impossible. We have no account of the eastern mountain-road that traverses the Kuenlun range. We only know that it connects the town of Lhasa in Tibet with Khoten in Thian Shan Nanlu, and that it traverses a very mountainous country of great extent, passing near the large lake of Teneri. North of the mountains by the narrow valley in which the town of Keriya is built. From Keriya it runs north-westwards through a hilly country to Khoten.

The western district of the Thian Shan Nanlu are occupied by several ranges, belonging to the Taratashling or Bolor Tagh. This mountain-system extends north of the mountain-knot of Pushitkhir, from 37° to near 41° N. lat., where it descends with long slopes towards the valley of the river Siooon, which descends from the spurs of the mountain Ozir, which almost forms the eastern boundary, and appears to be occupied by widely-spread rocky masses of mountain-ranges, between which only narrow valleys occur, that are visited by the wandering tribes of the Kirghiz only.
during the summer. It does not appear that any of the sovereigns of the contiguous countries have extended their authority over this extensive mountain-region, or over any part of it, which may be considered as a certain proof that no portion of it is cultivated; and this supposition is supported by the fact that it is not traversed by any commercial road, and that the two roads which connect Thian Shan Nanlu with Western Turkistan run along the southern and northern base of the Tartashling in the upper valleys of the two rivers Jihoon and Sihoom. We have some account of the mountain regions beyond the borders of these valleys, its penetration upwards of 200 miles into the mountain-region, but as these portions of the region are within Turkistan, they are noticed under that head. We shall only observe, that in the interior of this mountainous region, a number of Travellers, some 70 miles in the interior of Thian Shan Nanlu, an extensive elevated plain occurs, which is called the Table-land of Pamir. According to Marco Polo it takes ten days to traverse it from west to east; and, according to a Chinese traveller, it is 1000 li (equal to about 350 miles) long, and in some places 100 li (or 35 miles) wide, whilst in others it narrows to 10 li (or between 3 and 4 miles). The elevation of this table-land is so great, that no trees are found on it, and Travellers feel their respiration rendered difficult by the rarefaction of the air. The nomadic Kirghis, who visit this elevated region in summer on account of its excellent pastures, keep herds of camels and sheep, and of kasghow or yaks, which latter are to the Kirghis what the rein-deer are to the Laplander of Northern Europe, serving them as animals of burden, and supplying them with food. Their milk is richer than that of the common cow, but the quantity which the yak yields is less. The soil is the well-known chowry or hard dust of Hindostan. On the table-land of Pamir, which is situated on a high divide in an extensive valley, it is made into ropes, which strength do not yield to those manufactured of hemp. It is also woven into mats, and into a strong fabric which makes excellent riding-browsers. Among the wild animals peculiar to this region are the kutch-kar and the rass. The kutch-kar, or wild sheep, attains the height of a two-year-old colt, and has two fine curling horns; it congregates in herds of several hundreds, and is hunted by the Kirghis for its hide and flesh. The rass is a different animal, having straight spiral horns; it is less numerous than the kutch-kar, but equally prized as food.

The Thian Shan range extends along the northern boundary-line of Thian Shan Nanlu, which is separated by it from the government of Illi. This mountain-range has been noticed under Songaria, vol. xxii., p. 343, where also the range is described which forms the southern border of the Sihoon river-basin, and connects the Thian Shan Mountains with the Tartashling in the northern part, which is the road mentioned which, leading over the Thian Shan Mountains, connects Thian Shan Nanlu with the government of Illi.

**Songaria.** The largest supply of water is derived from the Tartashling, in which three of the great branches of the Tarim river rise. The principal branch originates within the mountain-region in a large lake, called Karakol, which is situated near 30° N. lat., and receives the drainage of a considerable country which surrounds it on all sides. The river issuing from this lake runs eastward, and is called Yasmay-yar. It leaves the mountain-region below Tashballik, near 73° 30' E. long., and is soon afterwards joined from the north by the Kashaar Daria, which brings to it the drainage of the north-eastern part of the mountain-chain. Near the point of confluence the rivers are met by a third river, which flows in a direction from east to west, and brings down the waters collected on the mountain-chain which unites the Tartashling to the Thian Shan. This river, which is called Kseyl Daria, runs about 200 miles. After the union of these three branches the river continues to be called Kashaar Daria, and to flow eastward without receiving any supply of water, until, between 80° and 61° E. long., where it is nearly at the same point joined from the north by the Aksu Daria, from the west by the Yarkihang Daria, and from the south by the Khotan Daria. The Aksu Daria brings down a large volume of water, collected on the eastern declivity of the western portion of the Thian Shan, and runs about 200 miles. The sources of the Yarkihang Daria are near those of the Jihoon, or Oxsu, south of 37° N. lat., and the upper course of the river is within the mountain-region of the Tartashling, where it runs eastward, but it issues from a about 70 miles above the town of Yarkihang by a southern course. Its course in the plain is first north-east, but below the town of Yarkihang nearly due east, and parallels to the Kashaar Daria for nearly 200 miles. After passing 80° E. long., it again turns to the south, and runs to the Kashaar Daria. Its course exceeds 400 miles; and among its numerous tributaries is the Misar river, which brings down water derived from the northern declivity of the Thuanling. The Kashaar Daria runs from the northern declivity of the Kuenlun range, east of 74° and west of 80° E. long., and runs more than 300 miles in a general north direction. In this river, and the mountains which are drained by its upper branches, the yaks are extensively kept, and within a few miles of the town of Li, the northern portion of the mountains, in China, and exported in large quantities: in all, this product is mostly bought by the court of Peking, as the wearing of this stone distinguishes the higher classes of the mandarins from the lower.  

After the confluence of these several branches the river is called Tarim, or Tarum-gol, and continues to flow in a nearly due east direction for 400 miles more, where, near 88° E. long., it is lost in an extensive lake, Lop Nor, which is bounded by a still more extensive lake, Lop Sair, and to the east of this lake, which is 81° E. long., it receives a considerable supply of water from the Thian Shan Mountains, by two rivers, the Uan, or Chagar Daria, and the Barun Yulduz, or Kadin River. The Uan Daria, which rises in that part of the Thian Shan Mountains, between 79° and 81° E. long., runs more than 200 miles in a south-east direction, and joins the Tarim near 94° E. long. The Kadin River is probably the largest of the confluences of the Thian Shan, as it collects the streams of the Thian Shan Mountains between 80° and 87° E. long. Its upper course is about 100 miles in an elevated valley, parallel to the Thian Shan range from east to west; issuing from the valley it turns abruptly to the east, and draining a large area of the Tashkabal valley about 300 miles long by an extensive flat, and then it falls into a large lake, which is called Besun Nor or Leng Lake, the dimensions of which are stated to be barely inferior to those of Lop Nor. This lake is surrounded by the north and south by chains of high hills, and east by a sand-dune. In the middle of the lake a break by which the Besun Nor discharges its waters into the Tarim. The channel by which this is effected is called Kaidu, and reaches the Tarim a distance of 100 miles. The Lop Nor, or east Tarim, is a vast extensive swamp surrounding Lop Nor seems to begin at the confluence of these two rivers. The whole course of the Tarim amounts, according to the estimate of Reutier, to nearly 1200 miles in a straight line, and if its windings are taken into account, and the Yarkihang, as well as its principal branch, it cannot fall short of 1500 miles.

The upper parts of this river and its tributaries are probably too rapid for navigation, and the lower parts of some of the tributaries of the Tarim, and of the river itself, through countries which are probably uninhabited. It is also probable that during the latter part of the summer and in autumn and winter, the quantity of water is very small, the rains being very scanty, and the whole supply of water from the melting of the snows on the mountains on which its branches originate. But the water of all these branches is used for irrigation, though that of the Tarim itself is not.

The Plate is of great extent, measuring on an average more than 300 miles from north to south, and about 400 miles from west to east. Its elevation is not known, but considering the peculiarities of its climate and its productions, it is presumed that it can hardly be less than 3000 feet above the sea, and that it is quite unfit for cultivation, and cannot even be used as pasture-ground. This is especially the case with the eastern districts, which are a complete desert. This desert occupies the whole country east of 88° E. long., and southward to the limit of the Lop Nor Lake. South of the river Tarim it extends westward to the borders of the Khotan Daria (81° E. lat.), so that it covers about one-half of the plain. The worst part is that which lies between...
east of 88°, and is called Han-hai, or the Dry Sea: according to an hypothesis of the Chinese, it is the bed of a lake, which has dried up at some remote period. Its surface is covered with a very fine sand, which is frequently raised into the air by the wind, so that the traces of the cars and animals soon disappear, except where they are marked by the bones of the beasts of burden which have perished in this desert, through which the nearest road leads from China to the Thian Shan Mountains. It is however asserted that there are a few places in the desert where it is possible to find water from one another, in which drinkable water is found by digging. That part of the desert which lies west of 88°, between the Tarim river and the Kueneu river, is called the Desert of Len. There is a principal cause for agriculture or as a pastoral country, the surface is diversified by large tracts of rocky and stony soil, in which a few animals, as wild horses and wild camels, find a scanty subsistence, and which are overgrown with low shrubs. Water however is a rare thing in the spring time. On the north, where it approaches the Thian Shan range, this vast extent of desert is skirted by a narrow tract of hilly ground, which is fit for cultivation or used as pasture-ground. Its width may vary between 20 and 30 miles, and it is in many places abundantly watered by rivers which descend from the mountains on the north, but which as soon as they have traversed the hilly region are lost in the sand of the Han-hai. A small portion of this tract is very productive on the Khera and Yarki-Daria, where it is used for cultivation and as pasture-ground. It produces rice, wheat, millet, and several kinds of vegetables, especially pomegranates, peaches, plums, but above all for its melons and apricots, which are especially delicate and the melons are of a very large size. Many places cotton is grown on a large scale. The greater part of this tract however is used as pasture-ground for horses, camels, cattle, and sheep. The lower valley, and between the Tarim river and the Thian Shan Mountains, contains a much larger portion of cultivable ground, especially in the valleys of the Barun Yulduz, or Kaidu river. The upper valley, where the river runs from east to west, is probably very high, and consisting of sand, except one portion, which is almost dry and desert. It produces rice, wheat, millet, and several kinds of vegetables, especially pomegranates, large quantity of fruits, and melons, which thrive exceedingly well. The pure and rich air of this valley is much colder. The lower valley, where the river flows from west to east, is more extensive, and a large portion of it is under cultivation, producing rice, wheat, millet, and sea-um, and containing large plantations of fruit-trees. The hills enclosing this valley rise probably more than 1000 feet above their base, and are used as pasture-ground. Along the base of such hilly and mountainous grounds, there are cultivated land which are irrigated by the streams that descend from the hills, but at the distance of a few miles seir water is lost in the sandy plain which extends along the banks of the Tarim river.

Farther west (between 80° and 80° E. long.), the hilly country is not so wide, extending only to the distance of 50 to 60 miles from the Thian Shan Mountains. The hills here have less elevation, and yield only a scanty supply of water for irrigation. The country is only well cultivated in the vicinity of the great mountain-chain, and grows more and more barren as it recedes from it, except along the banks of the Kagur Daria, or Kukri river, where cultivation extends so far as 80° east of the Thian Shan. A large portion of it is under cultivation, producing rice, wheat, millet and melons, which are grown in the whole of the country, and are exported to the Chinese market. The grapes grown here are very fine. Some plants are raised, which yield dye-stuffs, which are exported to China. The domestic animals the yak is numerous, and also the horses and sheep; cattle are rather scarce. North of this cultivated tract is a desert, in which many large bodies of water occur, but the surface is so sandy as to be of little use. This desert, which extends westward to the vicinity of Yarki-Daria, and northward to the banks of the Yarki-Daria, is known by the name of Kara-kital or Kiskistan. From this rapid survey of the productive powers of Thian Shan Nani it is evident that probably not more than one hundredth part of its surface is available for agricultural purposes. The deserts, and those tracts which are described as such, cover at least two-thirds of the area, and in the remainder of the country only a small portion which produce a few trees and good pasture. The utter sterility of the Han-hai seems to depend on the soil, but that of the other desert tracts appears to be the effect of climate. The climate of the Thian Shan Nani is distinguished by that dryness which is characteristic of all table-lands which are considerably elevated above the sea. As its elevation perhaps does not differ much from that of the table-lands of Castile in Spain, there produce rice and other grain in abundance, as well as rich crops of cotton. The uplands, which are north of the river, have a stony and rocky soil, covered with a thin layer of earth, sufficient to produce abundance of grass during the rainy season, and the northern parts of the country however, consequently they are used as pasture-grounds by the Kara Kirdis, who go in summer with their herds of horses and camels to the Thian Shan Mountains. The uplands between the Keryl Daria and the Kagur Daria have a sandy soil, which is useful for the growth of rice, but not for vegetable, and can only be used as pasture for a few weeks.

The western districts of the Thian Shan Nani, or those which extend at the base of the Tartashling, are not more favourable to cultivation than the northern districts which we have just described. The country between the Tartashling and the Daria, which is from the mountains, and has an abundant supply of water for irrigation, especially in the countries surrounding the towns of Kagur and Yarki-Daria. Farther down the country is not cultivated, the soil being washed away by the irrigation streams. The Tartashling and the Daria, which is partly exported, and partly used in the manufactures of the country; cotton, hemp, and flax are also cultivated. Fruit-trees are abundant, and their produce, pomegranates, apricots, and apples, constitutes an article of internal commerce. Melons and cucumbers are of excellent quality. The greater part of the country, though unfit for agricultural purposes, is covered with grass, especially those tracts which are mountainous, and accordingly it abounds in domestic animals, among which the horses and sheep are distinguished. The wool collected in these parts is hardly inferior to that of which the shawls of Oud and Tammur are made. There are also numerous herds of cattle and camels. We are less acquainted with the productive powers of the countries which extend along the base of the Thunngling, where our knowledge is limited to the tracts that lie between the Aksu and the Bosten, where part of it is under cultivation, and produces rice, wheat and millet, cotton, hemp and flax; large quantities of silk of the finest quality are collected. The vineyards are extensive, and the grapes grown here are much prized. Some plants are raised, which yield dye-stuffs, which are exported to China. Among the domestic animals the yak is numerous, and also the horses and sheep; cattle are rather scarce. North of this cultivated tract is a desert, in which many large bodies of water occur, but the surface is so sandy as to be of little use. This desert, which extends westward to the vicinity of Yarki-Daria, and northward to the banks of the Yarki-Daria, is known by the name of Kara-kital or Kiskistan. From this rapid survey of the productive powers of Thian Shan Nani it is evident that probably not more than one hundredth part of its surface is available for agricultural purposes. The deserts, and those tracts which are described as such, cover at least three-fourths of the area, and in the remainder of the country only a small portion which produce a few trees and good pasture. The utter sterility of the Han-hai seems to depend on the soil, but that of the other desert tracts appears to be the effect of climate. — The climate of the Thian Shan Nani is distinguished by that dryness which is characteristic of all table-lands which are considerably elevated above the sea. As its elevation perhaps does not differ much from that of the table-land of Castile in Spain, there
would probably be a great similarity between the climates if the table-land of Spain was not surrounded by a sea, which is not far distant from it, whilst the Thian Shan Nanlu is 1500 miles from the Pacific, which is the nearest sea. The climate of Thian Shan Nanlu is consequently much drier than that of Spain. Though abundant rains are experienced in mountainous countries which enclose the plain, and snow falls every winter to the depth of several feet, the quantity of snow and rain which descends on the plain is very small. In the deserts no rain occurs, and so that when the atmosphere is charged with vapour, and distant objects are indistinctly visible, it does not produce any other effect than that of generating extremely heavy gales, which are often so strong as to throw down travellers and their beasts of burden. In the Haritas mountains, the large quantities of rain lead to a considerable height above the surface. Along the Thian Shan Mountains only two or three showers of rain are annually experienced, and generally they do not continue above an hour. The rain is very minute, and it hardly moistens the surface of the ground. A little snow falls in the western districts, but seems never to occur east of the valley of the Kaidu river. The moisture required for the growth of plants is therefore entirely derived from the mountains. This moisture is in excess, abundant, but only for about two or three months of the year, and it would only be sufficient for a very limited agriculture, if the inhabitants had not acquired a peculiar art in its supply. In the districts south of the Thian Shan Nanlu Mountains great reservoirs have been made, which are filled by the watercourses after the melting of the snow, and from these reservoirs the greater part of the supply is taken, by which many tracts are made afraid to produce. In the eastern districts do not materially differ from the northern, except that a larger quantity of snow falls, though it is moderate in the plain. The temperature of these districts however is much colder in winter, so it is a remarkable fact that at Yarkiing the river is for the most part frozen. The Turks with thick ice, and caravans pass over it with their beasts of burden. The heat in summer is very great all over the country, but the cold of the winter seems to decrease as we ascended from west to east, as frost is hardly known in Hami. The Chinese however state that the difference between the temperature of the summer and winter is very considerable. The country is subject to earthquakes, and several districts suffered greatly from them in 1832, when they were felt on both sides of the Tar塔shing Mountains. It is probable that this phenomenon also occurs along the Thian Shan Mountains, as an extinct volcano exists in that range, and traces of volcanic action are frequently noticed by travellers.

**Productions.**—It is remarkable that Thian Shan Nanlu, though without doubt considerably elevated above the sea-level, produces all the grains and fruits which are cultivated in the most southern parts of Europe, which are situated at a greater distance from the equator, and less elevated. The olive-tree however has not been noticed as growing there. Sesamum, which is cultivated in most parts to a great extent, supplies the place of the olive-tree. The plain, as well as the mountains which surround it, are almost entirelyottesville of trees, and even of shrubs. In a few places only some species of trees cover a small extent of surface, but they are short and crooked, and only good for fire-wood. It is not certain, though it is probable, that the travellers, and the true rhubarb-plant grows on the mountains of the Tsungling. All the domestic animals of Europe abound, with the exception of hogs, which are only kept by the few Chinese settled in the country; all the other inhabitants, being Mohammedans, hold this animal in abhorrence. Camels are kept in the plains and on the mountains. The ranges of the Tar塔shing are considered the native place of the double-humped camel. In the same mountains the yak is an established fact; the large domestic animals are found in a wild state in the deserts of Thian Shan Nanlu. This is expressly stated of the horse, the camel, black cattle, and theasses; the last is probably the dabol, a beast, or Dass us biceps of Pallas; of the wild sheep there appear to be several species, but none of them have yet been ascertained. On the Thian Shan Mountains the argali is found, and on the Tar塔shing the kutch-kar and the ras above mentioned. The jackal is found in great numbers, and there are also tigers, wolves, lynxes, as well as foxes. On account of the want of natural forest, bees are not numerous, except water-fowl, which are abundant on the lakes of the desert and the swamps of the Tarza river. The Thian Shan Mountains a black eagle of great use is met with, and on the Tar塔shing a still larger bird can be seen.

Gold is said to be found in the seat of the Khagan Daria, where some quantity is stated to be collected. It occurs also, according to the account of the Chinese, in the eastern districts of the Thian Shan Mountains, where ever it is not collected. Copper and iron are certainly found at several places, and are worked, but the localities are not known. From the volcanic portion of the Thian Shan Mountains sulphur and sal-ammoniac are obtained. The Peking foresters say that silver is found in the mountain range, but they are said to exist in the eastern part of the last-above mentioned. Several other precious stones are abundant, and two of them, the yew and the agate, form considerable articles of commerce to China. This precious stone is only found in the eastern districts of Thian Shan Nanlu.

**Inhabitants.**—The bulk of the population is of Tungar origin, and it seems that this nation must be considered as the aboriginal stock of the country, as Thian Shan Nanlu is the most ancient part of the empire of the Hiougna, which was destroyed by the Chinese in the first century after Christ, and as the history of almost all the different Turkish tribes, however widely spread over Asia and Europe, may be traced to the Thian Shan Mountains. These mountains have a considerable influence on the climate of the adjacent countries. The Turks of Thian Shan Nanlu, Urbecks, as they resembles them exactly in the formation of their body [**Rumin.**, vol. v. p. 71], and speak the same language. It is however certain that the Turkestan tribes are not intermixed, as that of the other Turkish tribes, with terms derived from the Persian and Arabic languages, and it is therefore considered the purest of the Turkish dialects. The Memoirs of Sultan Baber are written in their own language, and it is certain that the Turks are decidedly superior in civilization to the Urbecks of Bokhara. They exhibit no less industry than ingenuity in the cultivation of the land, and the articles which are manufactured are of good quality and much prized. Many of them are also engaged in commerce.

They are at present divided into two tribes, Ash-tak and Kara-tak, which hate one another, and frequently make war on each other, which circumstance is considered the principal reason of their inability to resist successfully the invasions of the Olithas and of the Chinese. Each of these two tribes was governed by hereditary chiefs, who were independent of one another. When the Chinese occupied the country, they left the internal affairs in the hands of the Cossacks, who were in charge of the department and the police, as far as regarded the neighbouring independent states. The army which the Chinese keep in the country, and which amounts to between 20,000 and 30,000, is composed of Manchours officers: one at the places through which the caravans-road passes, and foreign countries the custom-officers are composed half of Chinese and half of Turks. But all the other officers are appointed by the Hakim Bega, as the chiefs of the country are called, but the Hakim Begs themselves are chosen or confirmed by the court of Peking. The tribute which the Chinese government levies upon the inhabitants is small, but is somewhat increased by the duty on the merchandise which is imported and which, according to the latest information, is 30 per cent. The inhabitants however are governed by their native chiefs, as the Chinese government appears to take no notice of the way in which they are governed. For this reason they are ill-disposed against the Chinese and this hatred is still increased by the ever-increasing fortifications which have lately been erected by the general labour of the natives. The Chinese merchants who are settled here are not permitted to go to the neighbouring countries which are independent of China, and the foreigners who buy and sell there are therefore carried on in the trade of the country, mostly by the Tajicks. The Turks are Mohammedans.

The Tajicks, or Tadjacks, are that nation which compose the Persian as its native language, and which is written in the Persian alphabet. The Tajicks of the Alar too are distinct, but instead of only a few mountain valleys exclusively. In settled the Tajicks their industry is mostly directed to the cultivation of the soil, but in Thian Shan Nanlu they chiefly engaged...
in trade, and therefore many of them are met with in all commercial places. They are known to Europeans by the name of Bokhara, or by that of Fergana, who visit the fairs of Nishnevogorod and other places are Tadjiks. They are permitted even to trade in the western provinces of China Proper, in Shenai and Shanai, and some of them, if caught, they conform in their dress and costume to the Turks, but preserve their language. They are Mohammedans.

Though Thian Shan Nanlu was subject to the Khalkas Mongolos for a considerable length of time, no traces exist of their having held any lands across the range from Kuldsha to the east. The Olith Calmucks, when governed by the Galdan and his successors [Songaria, vol. xxii., p. 245.], occupied it for a short time, and as they expelled the Khalkas wherever they met them, the total absence of Mongol colonies may be accounted for. Olith Calmucks are however in the eastern districts, especially in the towns of Hami and its vicinity, a considerable number of Olith Calmucks, who after the defeat of the Galdan quietly submitted to the sway of the Manchoes. The number of Chinese is not large. Besides the officers of government, a small number are established in the large commercial towns as merchants; some of them also exercise other trades; but it does not appear that agricultural settlements have been made by them in this country, as in Songaria.

From Olith another and larger division of the Nanlu Nanlu is a tribe of Kirghis, called the Kara Kirghis, and another tribe of that nation is met with in the ranges of the Turchaling. Both are nomadic tribes, occupying during the summer the highest portion of the mountains, and in the winter the basin, with sheep and, and descending in winter to the lower regions.

**Commerce, Towns, and Manufactures.** — Nearly 1800 years ago a commercial road was established, which traveled across the country in its length from east to west, on which the commerce between China and Western Asia has been carried on nearly without interruption. After the downfall of the empire of the Hsiung-nu under the dynasty of Han, when the dominion of China extended to the shores, it was exported to distant countries. On arriving at the boundary of the Western or Roman empire, this road was first used for purposes of commerce, and silk and other articles were thus brought to Western Asia. This road passes through the countries which lie along the base of the Thian Shan Mountains. Another road, which has probably been used for an equal length of time, connects Thian Shan Nanlu and China with the northern parts of India, especially with Cashmir, and is also much used at the present day. As almost all our knowledge of the towns of this division of their manufactures is derived from the accounts of the merchants who have passed along these roads, we shall follow their track in noticing them.

The caravans of China, bound for the western countries, or the goods of the latter en route for China, pass through the deserts of Shatshelou and the gate of Kia-yu-ko-oan [Tangut, vol. xxiv., p. 32], pass through the desert of Han-hai and arrive after 20 days' journey at Hami (42° 53' N. lat. and 93° 56' E. long.). Hami, or Kasmil, as it is called by the natives, is a fortified place, being surrounded by high walls, which enclose a space about two miles and a half in circuit. The town is surrounded by large suburbs, where the caravans stop before they proceed for the west, and is populous. The streets are straight and regular, but the houses low and built of dried clay. The country which surrounds the town is not distinguished by fertility, but it is cultivated with extraordinary care and industry. Grapes, melons, and other fruits are sent to China in great quantities.

About 240 miles west of Hami is Pishdan, a fortress which is nearly two miles in circuit, and near which the caravan road passes. About 60 miles further is Turfan, a considerable place, which however suffered much in the wars of the last century. Karashar is 290 miles west of Turfan. Its fortress is not large, not exceeding one mile in circuit. The town is rather populous, and built on the banks of the Kaidu river, which is said to be navigable at this place. Its commerce is considerable, but manufactures are not much noted, except that the inhabitants excel in the art of embroidery. Kurli, or Kunungi, is situated on that portion of the Kaidu river which connects the Boeto; Nor with Lop Nor, and contains a population of about 4000 individuals. The country round the town is very fertile. The town is 50 miles distant from Karashar to the south-west. Bukur or Bogur, nearly 200 miles distant from Karashar, contains 2000 and 2500 individuals, and has a considerable commerce in copper, oil, sheep-skins, butter, and furs, especially lynx-skins.

Kutshe, which is 100 miles distant from Bugur, is a large town which is three miles in circumference, and contains a great number of inhabitants. The mountains north of the town contain several mines, from which copper, saltpetre and sulphur, and sal ammoniac, are obtained. At this town begins the road which runs through the Kuldsha Mountains to Kuldash to the mountain-pass called Mussur Dabah. Before it reaches the mountain-pass, it runs through the town of Sairim, which is built in an elevated valley, and near some mines. South-west of Kutshe is the town of Sharyar, in a district producing a number of cottons, and fruit. It contains a population of 4000 individuals.

In the valley of the Aksu Daras are the towns of Aksu and Ushi. Aksu is a large commercial and manufacturing place, which, according to one statement, contains 5000 houses, and, according to another, a population of 20,000 families. It is not fortified. Its commercial importance is not only derived from its being one of the largest places of depot on the great caravan-road from China, but also because it is the port of call for the caravan in its passage to the mountain-pass of Mussur Dabah, by which it communicates with Kuldasha, the capital of Kip, and by which it not only receives the produce of that country, but also several articles brought from Russia. [Songaria, vol. xxii., p. 290.,]; a road to the town of Kutshe sometimes proceed as far as this place, and it is likewise visited by traders from Khokand, Tashkent, and Bokhara. Its manufactures are numerous, especially those of cotton-stuffs, among which one called bahram is in great request in Siberia and Turkistan, and a kind of stuff, half silk and half cotton. Several articles made of leather, especially those of deer-leather, as harness and saddles, which are embossed with great art, are also highly valued, and exported to other countries. The district of Aksu contains many persons are employed in cutting and polishing precious stones. The Chinese garrison, consisting of 3000 men, inhabits a separate quarter of the town. Ushi, which lies higher up in the valley of the Aksu Daras, is built in the centre of an extensive country of great fertility, and is stated to contain 10,000 families. This place has a mint, in which copper coin is made, and it appears to carry on a considerable commerce.

The town of Osh is situated in the north-western angle of Thian Shan Nanlu, and at the commencement of the mountain-road which, traversing the chain that connects the Thian Shan with the Tartashlings, leads to Ferghana and the towns of Khokand and Tashkent on the borders of the Karakorum. At this place also begins the other caravan-road, which, running south-east and passing along the eastern declivity of the Tartashlings, and passing through the towns of Yarkiang and Khotan, leads over the Karakorum Pass to Lih, Gortopu, and Cashmir. Besides these two lines of communication and the great caravan-road to China, a fourth road, commencing at Kashgar, runs north-east over the Thian Shan Mountains by the Rowat Pass, and, skirting the western shores of Lake Isekel, leads to Kaldaha and the banks of the Irish river. This last road appears to be much frequented by Russian merchants. The advantages derived from all these roads concentrating at Kashgar render this town one of the most considerable in the interior of the country, and contain 15,000 houses, and a population of 90,000 individuals. In the Chinese geography the population is said to consist of 16,000 persons paying a capitiation-tax, which would carry it to rather more than in the total number of the Russian inhabitants. The Turkish and Bucharun merchants of Kashgar visit the countries north of Hindustan, Bokhara, and Tobolok; and numbers of merchants who are settled in the neighbouring independent states are always found in the town. All these are not independent of the Russian authority; but the entry of Europeans is prevented by the Chinese authorities. In the middle of the town is a large square, from which four extensive barracks branch off. The Chinese garrison consists of 8000 men, stationed here to repel any attacks from the side of Kho- kand, and are quartered in a strong fortress, which is con
tiguous to the town. The manufactures are numerous and extensive: the largest are those of silk, in which several kinds of damask, damask cloth, and damask of various kinds are interwoven with gold and silver thread. The manufactures of cottons are less important, but their colours are much praised. The jewellers are very expert in cutting the yew and in working gold. Many articles are exported to China by the large caravan-roads that Kashgar and its commercial and manufacturing industry had suffered much by the invasion and rebellion of the Kojdas (1827), and that Yarkiang had become a much more commercial place than Kashgar. It is very probable that the importance of South-west of Kashgar is the town of Thabalgil, which seems to be an important place, built on the banks of the Yaman-yar river, where it issues from the mountain-region of the Tartasking. On the road between Kashgar and Yarkiang is Yengi Hisar, a place of considerable extent.

Yarkiang, or Yarkand, may be considered the capital of Thian Shan Nanlu, as the Chinese military government generally resides here. It consists of the city or fortress, which is surrounded by a high wall of stone, and is more than three miles in circumference, and numerous suburbs which lie round it. In the fortress a garrison of 7000 men is kept. The houses are mostly built of sun-dried bricks; but as rain is very rare in this country, they may be considered as almost as strong as those of Europe. The river Yarkiang, or Dairis, is divided into two arms, and numerous canals have been made from them, by which all the streets are abundantly supplied with water. There are numerous public buildings, especially the mosques, houses of the bazaars, or caravanserais, and the medrasas is stated to exceed ten. There are two large bazaars, one in the city and the other in the suburbs, which are more than three miles long, and contain a great number of shops, well supplied with various articles of merchandise. Most of the shopkeepers are Chinese. There are several large caravansaries. The country surrounding the town supplies it with three important articles of commerce, silk, fine wool, and horses, of which last great part goes to other places. These horses are mostly of the Kirghis breed, rather small, but very strong, and much prized. The commerce with the countries north of Hindustan and with Tibet is very considerable. It is stated that there are several kinds of manufactures, but only cotton-stuffs are specified. The number of inhabitants who pay capitation-tax is stated to be between 30,000 and 40,000, which would give a population of between 180,000 and 240,000. Many foreigners are settled in this place. The number of Chinese merchants is not stated, but there are many Chinese engaged in trade and manufactures. A great number of merchants from Shenzi and Shansi visit Yarkiang. There are also a considerable number of natives of Cashmir settled here; but of the Hindustanis, Persians, or Armenians, the foreign merchants, who are met with in considerable numbers, are from Ferghana, Tibet, and Cashmir. Thian Shan Nanlu has never in any way been connected with the political events of Europe and Western Asia, but frequently with those of Proper China, and it is only from the Chinese and Mongol historians that we learn the political changes to which it has been subject. Thus we are informed that before and at the beginning of the present century there was a portion of the powerful empire of the Hissar, a Turkish race, which for more than two centuries made war on China, and sometimes laid waste the northern provinces; but in the first century after Christ was overthrown by the dy- namics of the Mongol conqueror. From the tenth to the thirteenth century it formed a part of the extensive empire of the Hissar or of Tangut (Tāourg, p. 33), the overthrow of which, in 1227, was the last of the numerous and great exploits of the Mongol conqueror. [Genio Khan, vol. xi, p. 117] Thian Shan nanlu is a Chinese term, and soon after its division it was united to that country, and it remained so as long as the descendants of Genio Khan were masters of China. But when the Yuan dynasty was overthrown by the Ming dynasty, the Mongol empire was split into several states, Thian Shan became independent, and several small sovereignties arose under chief of Turkish origin. The Ming emperor would probably have succeeded in subjecting them, but he died before he entered the country towards the end of the fourteenth century, and brought it under his dominion. After his death the Turkish chiefs gradually resumed their independent station, and preserved it to the middle of the sixteenth.
The ground that Henry, when departing for the East, had ceded all his lands in France to his brother, in the event of his not returning within a year, the seigneur of Brienne was persuaded to abandon his claims upon receiving a compensation.

In the same year Thibaut took upon himself the management of his domains, which rendered him, by their extent, and the extent of their power passed from the Oldis to the Songares (SOGARIA, vol. xxii., p. 245), who soon established their authority among the Turkish princes in Thian Shan Nanlu, and even subjected Tibet. They kept it until their widely extended subduing them by nothing except their authority, except their more numerous for the subjection of Thian Shan Nanlu through the wide desert which separates Poor China from their country, and they refused to submit to the authority of the Manchou emperor. But the emperor sent two armies from Lii over the Thian Shan Nanlu Mountains. The first was only partly successful, and took Kutase; but the other, under the command of Tahahoei, subjected the whole of the country, and in 1759 the Kodjas was confirmed in possession of it.

In 1765 an insurrection broke out in the town of Ushi, but it was soon put down. In 1826 the descendants of the Kodjas, having insinuated themselves into the favour of the Khan of Khokand, and obtained from him the support of a small piece of land, they could not without some difficulty succeeded in taking Khorassan, Aksu, Yarkiang, and Khotan; but a Chinese army of 60,000 men being sent against them, they were defeated in three battles, and again retired to Badakshan, where Wood, in his journey to the source of the River Oxus, found one of these Kodjas living in exile.

(Du Halde's History of China; Mailla's Histoire Générale de la Chine; Klaproth's Magasin Asiatique; Wood's Narrative of a Journey to the Source of the River Oxus; Ritter's Erdkunde von Asien, vol. i., ii., and v.)

THIBAUT V., count of Champagne, and first king of Navarre of that name, occupies a respectable rank among the Troubadours. It has been pretty satisfactorily shown by recent writers on the subject that the scandalous stories told of this king by Matthew of Paris and others rest upon no satisfactory evidence. They have however been repeated and made current in the French annals, and to all deceivers than in substituting anything in their place. They have rendered Thibaut's biography in a great measure negative.

He was born about the beginning of the year 1021, and has been called Theobaldus Poethamus, on account of his father having died before his birth. His mother, Blanche, daughter of Sancho the Wise, king of Navarre, took charge of and governed his extensive territories as regent for twenty years. A taste for literature was hereditary in the family of Thibaut. His grandmother, Marie of France, held, about the middle of the twelfth century, one of the most celebrated 'Courts of Love,' and some of her judgments have been preserved by Andre le Chapelain. His mother Blanche induced by her commands Aubin, seigneur of Sezane, to compose several songs, after he had solemnly renounced the practice of poetry. With such examples before him it was natural enough that the young count of Champagne should contract a taste for rhyming.

The story of the year 1032 must be told. He征 the territories of Champagne from the widow and her son. The father of Thibaut was a younger son: his eldest brother Henry followed Philippe Auguste to the Holy Land; and, marrying there Isabella of Cumberland and Denmark, had by her two daughters, Alice, queen of Cyprus, and Philippa, who married Airard de Brienne. The father of Thibaut V., after his brother's departure for Palestine, took possession of Champagne and Brie, which had been seized by a widow in name of her son, till 1214. Airard de Brienne then claimed them in right of his wife. Philippe Auguste decided in favour of Thibaut, and the sentence was confirmed by the peers of France, in July, 1216, on the ground that Henry, when departing for the East, hd not given the proper,. The king of Jerusalem, the seigneur of Brienne was persuaded to abandon his claims upon receiving a compensation.

But it is easy to see how the rumour mentioned by Matthew of Paris arose. A rhymed chronicle, apparently of the age of Thibaut, represents him as going
about (1230) in disguise to learn how men spoke of him, and discovering he had no friends. About this time there were violent disputes between the university of Paris and the papal legate, and, the queen supporting the legate, the wise student being in rife with the reports of a faith to a guilty passion for his person. In times of civil dissension it is generally found that parties otherwise totally unconnected catch up and spread each other's lies when it suits their purpose. The queen, the legate, and the court of Champagne were all unpopular: the absolute students had circulated imputations against the chastity of the two former; and the interference of the king to prevent the marriage of the last-mentioned with the daughter of the duke of Brittany, who, under such circumstances, might have been easily introduced into a plot of the queen-mother to keep him for herself. It was amongst the students that the first story was invented, and that is the quarter whence Matthew of Paris most probably obtained much of his information regarding French affairs.

In 1232 Thibaut married a daughter of Archchambaud VIII. of Bourbon. In April, 1234, he succeeded to the throne of Navarre, on the death of Sancho the Strong. In 1235 he quarrelled with his rival, Louis. About the territories he had ceded to the king at the time of the arrangement with the queen of Cyprus, representing them as merely transferred to the king in security for the money he advanced, while the latter asserted that they had been sold to him for that sum. It came to blows, and Thibaut was beaten.

In 1239 Thibaut took the cross, and set out at the head of an expedition to the Holy Land. He displayed none of the talents of a general. Unable to procure ships to transport his army to the scene of action, he marched through Hungary and Thrace. Arrived in the neighbourhood of Byzantium, his treasure was so completely expended, that his followers had to support themselves by plunder. While he was engaged in this, the king of the army under his immediate command was beaten, although the other was victorious. He got involved in the deliies of Taurus, and lost two thirds of his men. Lastly, at the final defeat near Ascalon, he fled ingloriously before the battle was ended, leaving his followers to their fate.

He returned to Pampluna, which he had made his capital, in 1242, and died in 1253, having done nothing worthy of notice in the interim, leaving a widow and six children.

The poems attributed to Thibaut are in number sixty-six, and there appears no reason for questioning the authenticity of any of them. Thirty-eight are devoted to the crusaders, and the remainder, which are mostly of a satirical character, amount to little, and are of uncertain date. They are not, however, of great value, being generally composed in French verse, and there is no evidence that Thibaut was acquainted with the rudiments of this branch of literature.

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of the town presents a pleasing appearance, from their being painted in fresco in a manner similar to those of Nice; but on the southern side, the road from Lyon: the town is inhabited by workpeople, and inhabited by workpeople, and independent of large houses, bordered by gloomy houses, disappointment expectation.

There is no public building worthy of notice, and no public square or place except one at the entrance of the road from Lyon: the town is inhabited by workpeople, and inhabited by workpeople, and independent of large houses, bordered by gloomy houses, disappointment expectation.

In the nineteenth century, the iron is brought from Nîmes, Berry, and Franche-Comté. There are in and round the town 600 manufactories or workshops for cutlery, employing, it is said, 8000 persons in the manufacture made for the sites of the mills: this branch of industry has been established in the town from the sixteenth century.

The quality of the paper manufactured here is good, and a large portion of it is sent to Paris. The razors, knives, and scissors, though of ordinary quality, command a good sale, and are exported to Spain, Italy, the Levant, and the East and West Indies: the iron is brought from Nîmes, Berry, and Franche-Comté. There are in and round the town 600 manufactories or workshops for cutlery, employing, it is said, 8000 persons in the manufacture made for the sites of the mills: this branch of industry has been established in the town from the sixteenth century.

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tained in crystals. If sulphurous acid gas be passed through a saturated solution of allorn in water, brilliant white crystals are obtained, which are thiorurate of ammonia; these are to be decomposed by acetate of lead and the thiorurate of lead formed is to be decomposed by hydro-sulphuric acid. By separating the sulphuret of lead, and evaporating the liquor, thioruric acid remains.

It is proposed that it is a white crystalline mass, readily soluble in water, and the solution reddens litmus strongly; it contains the elements of two equivalents of sulphuric acid, one equivalent of ammonia, and one of allorn, or-

Seven equivalents of hydrogen . . . 7
Eight equivalents of carbon . . . 56
Three equivalents of oxygen . . . 112
Equivalent . . . 249

When heated, it is decomposed, much sulphuric acid remains in solution, and a crystalline compound is formed, which is termed uramite.

Thioruric acid combines with bases to form salts, which are termed thiorurates; they are not however of sufficient importance to require description.

THIONVILLE, an important town in France, capital of an arrondissement in the department of Moselle, 238 miles east-north-east of Paris, by Meaux, Château Thierry, Châlons-sur-Marne, Mâcon, Verdun, and Metz: it is in 41° 20' lat. and 6° 11' E. long.

Thionville (Latinized, Theodonis Villa) was a place of consequence in the time of the kings of France of the Carolingian dynasty, who had a palace here: several important battles were held at Thionville in the reigns of Charles-le-Magnifique and his son Louis le Débonnaire. After the extinction of the Carolingian dynasty, the place came successively into the hands of the counts of Luxembourg, the dukes of Bourgogne, and the house of Austria, passing to the French in 1620. The town took it from the Spaniards, A.D. 1556, but it was restored the following year. In A.D. 1639 it was besieged by the French, who were entirely defeated by an army sent to its relief; it was however taken by the prince of Condé, A.D. 1643, after the battle of Rocroy, and has ever since remained in the power of the French. It was bombarded by the Austrians in A.D. 1792, and again by the allies in A.D. 1814. Thionville is surrounded by strong fortifications, and is the third and one of the barriers of France toward the Rhenish provinces of Prussia. The town is on the left or west bank of the Moselle; the citadel on the right bank: the two communicate by a bridge, the piers of which are of stone, and the upper part of wood. The citadel is pleasantly situated on the south-east side by the canal of Yutz, over which are two bridges of stone and one of wood. The entrance into the town is by six gates: the houses have little worthy of notice: there are a good parade, a parish church which deserves examination, a riding-school, a corn-market, a theatre, an arsenal, a college or high school, which occupies the ex-convent of the monks of St. Augustin, an hospital, and a military prison. There are some manufactories of bowiers, woollen cloth, hats, household furniture, and candles: there are breweries, tan-yards, and oil and slack mills. There is one yearly fair.

The population of the commune of Thionville, in 1826, was 5821; in 1861, 5946 (of whom 4142 were in the town); in 1866, 5980. There are a subscription court of justice, several fiscal and administrative government offices, and a society for the encouragement of agriculture and industry.

The arrondissement of Thionville has an area of 406 square miles, and comprehends 177 communes: it had, in 1811, a population of 83,237; and in 1866, of 87,781, of which is divided into five cantons or districts, each under a justice of the peace.

(Malte-Brun, Géographie Universelle; Dictionnaire Geographique Universel.)

THIRD, an interval in music, clasped among the imperfect conords, because liable to alteration; that is, the third may be either major or minor. The ratio of the Major Third is 5:4; of the Minor Third, 6:5. The former comprises one major and one minor tone, as c e.

The latter comprises a major tone and a semitone as a c.

Major Third. Minor Third.

Or, according to the mode of description adopted by music writers on the subject, the Major Third comprises, successively, five semitones; the Minor only four, Example—

Example—

Major.

Minor.

THIRLAGE, a tenure or custom formerly very common in Scotland, by which the owners or occupiers of certain lands were compelled to take their corn to a particular mill, to which the lands were said to be thirled or attached, and to pay a certain proportion of it, varying in different cases, as a remuneration for the grinding, and for the expense of the erection and maintenance of the mill. Thirlage also bound the occupiers of the thirled lands to the performance of certain services for the maintenance of the mill and mill-dam, the carrying of millstones from the place at which they were purchased. The thirled lands were extended upon the thirled lands, with the exception of seed-ears, and such as might be used as food for horses on the farm in the state of grain. In some cases this kind of thirlage was modified by a provision to enable the farms, upon payment of a sum or proportion of corn as compensation, to sell the remainder of his grain without taking it to the mill to be converted into meal. The third kind of thirlage, called thirlage of inertia et illata, required that all corn brought within the thirled district, whether it might have been raised, should be taken to the designated mill, that is to say, the mill to which the district was attached or bound. This kind of servitude, having become in many cases exceedingly oppressive, has fallen into disuse, an annual payment in grain being substituted. Further particulars respecting this tenure may be found under Rea's Cyclopaedia, art. 'Thirlage'; and in the statute 'Law' (clxxx. 12, 18) in the fourth edition of the Encyclopedia Britannica.

THIRLWALL, Cumbria. Saint, Spix's name for a genus of Coleoptera which, according to Cuvier, seems to have many characters in common with Melolonthus; its thumb carries a small concave palate which is peculiar to it, and enables it to hook itself better than it otherwise could.

Example, Thysperia tricolor, Spix, 36, c. 8.

Cuvier remarks that he places this subgenus with doubt, because the description is incomplete.

THIRSK. [Yorkshire.] THIRST is the peculiar sensation which excites the desire to drink. Water is the proper object of the desire. Of all the warm-blooded animals which are subject to thirst, man alone is either disposed, or, by the circumstances of his artificial mode of life, compelled, to satisfy it with any other liquid; and in this the various beverages which man has invented, the water with which other ingredients are combined is the only part which is essential to the satisfaction of thirst.

The times and degrees in which thirst is felt during health depend upon the quantity of water necessary for the repair of its tissues and the maintenance of their proper moisture, and for the replacement of the fluid which is constantly lost by perspiration and other discharges. But the quantity of water necessary for this purpose varies greatly, according to the different circumstances of age, sex, and temperament, and still more according to the nature of the food taken, the state of the atmosphere, the mode of life, and the custom of the individual.
hard or salted food excites great thirst, probably because a large quantity of fluid is abstracted from the blood for its digestion; but fruits and soft vegetables assist, by the quantity of water which they contain, in quenching thirst; and infants, receiving their food and drink at once from the milk which is naturally provided for them, are perhaps not sensible of thirst as a healthy sensation different from that of hunger. Strong drinks, again, excite thirst, but in the same disease of which the true pathology is unknown and which has been named polydipsia, from its chief symptom being an excessive and insatiable thirst. Several examples have been recorded, in some of which the thirst probably depended on a constant discharge of fluids from the alimentary canal, on the peristaltic action of the digestive canal, or by the great quantity of fluid which, by exosmosis, they withdraw from the blood.

As a general rule, the degree of thirst during health is directly proportioned to the rapidity of the exhalation of sweat, which in all healthy persons is not considerable, and which, in the season of the year in which this subject is to be considered, is not excessive. It is not sensible, for the sweat itself is insensible in amount, which is the case when the air is moist and the skin is heated, and the skin is heated, and the air is dry, the irritation is insensible, the evaporation from the skin is increased; and that which is produced by exposure to a dry brisk wind.

The sensations and other circumstances accompanying ordinary and extraordinary circumstances cannot be described. The sensation of dryness of the mouth and throat, which most strongly characterizes it, is not always the result of the heat being really deficient in moisture, nor is it removed by the introduction of anything. It becomes painful to the animal which is excited, which is the case of that class of local sensations which are indicative of peculiar general conditions of the body, or of the state of some other part in which no sensation is perceived. These have been called reflex sensations; and it is by this name that they have been most commonly observed, and which is termed thirst, is that the animal perceiving them is impelled to actions which tend to the health of the body. For example, the irritation which is felt at the upper part of the throat, and which induces one to cough, is often due, not to the heat of the body, but to the introduction of some irritant substance, such as mucus, in a distant and insensible part of the air-passages. From the latter part an impression is conveyed to the nervous centre; hence, without directly giving rise to a sensation, it is sufficiently suggested to the sensitive nerves of the glottis; and the sensation which is perceived through these excites the desire to cough, and thus leads to the expulsion of the irritating substance. In like manner the sensations which have been supposed to excite the desire to drink are not so much to remove merely the sensation, but the more important condition, such as a deficiency of water in the blood, of which it is a sign.

But as cough may be produced by a direct irritation of the mucous membrane of the mouth and throat, so a sensation similar to that of thirst is often due only to a rapid evaporation from the mouth and throat, as in long speaking or singing; but this may be removed by merely washing the mouth and throat, or by exciting a flow of saliva; means which are insufficient for the remedy of real thirst. The introduction of water into the blood is necessary for quenching thirst has often been proved in persons who in attempting suicide have divided the pharynx or oesophagus, so that they could no longer take water. The phenomenon of Lyson of Athens, the mouth has been altogether unavailing to relieve their thirst; but the injection of water through the wound into the stomach has quickly removed the sensation of dryness in the mouth, though none of the water passed through it. Similar facts have been observed in those who, being unable to swallow or to have liquids forced into their stomachs, have been long immersed in baths, and in shipwrecked sailors who have had no fresh water and have relieved their thirst by keeping their clothes soaked with sea-water.

The thirst of many diseases, such as acute fevers and important inflammations, affords another proof of the sensation peculiar to it being chiefly a sign of some general condition; for in these the sensation is not last more, but after large quantities of water have been imbied, being here more dependent on some condition of the blood which dilution does not remedy. In certain cases also the sensation seems to be entirely subjective, and dependent on a peculiar condition of the nervous system. This is remarkably the case in a disease of which the true pathology is unknown and which has been named polydipsia, from its chief symptom being an excessive and insatiable thirst. Several examples have been recorded, in some of which the thirst probably depended on a constant discharge of fluids from the alimentary canal, on the peristaltic action of the digestive canal, or by the great quantity of fluid which, by exosmosis, they withdraw from the blood.

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Thirteen tyrants was the most entertaining. In what manner the rule of the Thirty Tyrants was at last overthrown, and the democratic constitution was restored at Athens is related in the article THRASYBULUS. (N.P. Simpson, Τ. 3, 24.)

Thirteen Tyrants. (Under the Roman Empire.) This name has been given to a set of usurpers who sprang up in various parts of the Roman empire in the reign of Caligula. Their title is derived from their resemblance to the Thirty Tyrants of Athens, a name which, on account of the stirring events connected with it, was not without its significance in Rome. The Thirty Tyrants have been compared to the Thirty Tyrants of Athens, a name which, on account of the stirring events connected with it, was not without its significance in Rome. The Thirty Tyrants have been compared to the Thirty Tyrants of Athens, a name which, on account of the stirring events connected with it, was not without its significance in Rome. The Thirty Tyrants have been compared to the Thirty Tyrants of Athens, a name which, on account of the stirring events connected with it, was not without its significance in Rome. 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their subjects in religious affairs, which right was gradually considered by them as a right of reforming the state of religion in their territories. The Roman Catholic Church employed the Jesuits and the Capuchins; the Jesuits were active in the conversion of men distinguished by birth, by knowledge, or by their social position, and the Capuchins, to which was assigned the task of the people. Their zeal and success occasioned bitter complaints on the part of the Protestant princes, who however gave causes of complaint equally numerous and equally well founded to the Roman Catholics. The dissatisfaction of the people was augmented by the policy of the princes.

The ecclesiastical dignity of a bishop having lost all its significance in the Reformed religion, the Protestant bishops became mere temporal princes. Among their number were the archbishops and bishops of Bremen, of Minden, of Liibeck, of Osnabruck, of Ratzeburg, of Halberstadt, and of Minden. There being, at the same time, some hope that the Protestant bishops might become hereditary princes in their bishoprics, the Roman Catholic bishops of Münster, of Paderborn, of Hildesheim, and the elector archbishop of Cologne, manifested their intention to adopt the Protestant faith. Availing themselves of the privilege granted them by the 'jus reformandi,' they encouraged their subjects to adopt the Protestant faith. The Roman Catholic bishops tried all in their power to prevent such changes, but the Protestant princes favoured them, and each party had its motive for doing so, as the younger sons of the princes and nobles of both parties were usually appointed bishops, abbeys, and canons.

The Roman Catholic party recovered its political influence towards the end of the sixteenth century. The Protestant elector archbishop of Cologne, Gebhard, count of Solms, who was dead and his successor, Ernst, duke of Bavaria, who held together the bishoprics of Cologne, of Liège, of Münster, and of Hildesheim, oppressed the Protestants in all his extensive dominions. The bishops of Würzburg and of Bamberg, assisted by the Jesuits, employed the same methods against the Protestants; and the archbishop of Salzburg treated the Protestants with unheard-of cruelty. In Strassburg there were at the same time a Protestant and a Roman Catholic bishop, who, after a bloody feud, were both sustained by the emperor Rudolph II. in those parts of the bishopric which they had conquered (1583). The Roman Catholic people were equally persecuted by the bishops of Halberstadt and of Osnabruck, and the troubles were increased by the differences which arose in the Protestant party itself between the Lutherans and the Calvinists.

The leader of the Calvinists was the elector palatine Frederick IV., who, with a small number of Calvinist princes, refused to appear at the diet of Regensburg (1602), and by which Rudolph II. was placed in the position of obtaining the assistance of the empire against the Turks. Frederick and his party declared that they would not assist Rudolph in the Turkish war, unless he satisfied the claims of the Protestants, and at the same time they promised a subsidy of 400,000 gulden to Henri IV. of France if he would restore the Protestant bishop of Strassburg to the entire bishopric. The Lutheran princes expressed the utmost indignation at the treacherous conduct of Frederick IV., and they sent their contingent to the Turkish war. But from that moment there was a French party among the princes of the empire, and we shall afterwards see how dexterously France managed her influence over Germany.

This opposition to the Catholic war was dissolved in 1600 without any results with regard to the peace of the empire. The Roman Catholic states claimed the restitution of all the territories, bishoprics, abbeys, and churches, which had been seized by the Protestants since the treaty of Passau (1555); but all these demands were refused, and the Protestants princes from yielding to these claims, that they resolved to resist them by every means in their power. For that purpose they concluded the 'Protestant Union' on the 4th of May, 1606, of which however the Catholics also claimed to be a member. The elector palatine Frederick IV., a Calvinist, was the leader of the Union. The members of the Union immediately levied troops, and sent ambassadors to England, France, and Venice, thus giving the example of a well-organized rebellion, and showing that they would resist the emperor and break the constitution of the empire with the assistance of foreign powers.

The union of political and religious interests increased after the death of John William duke of Jülich, Cleves, and Berg (1609), one of the most powerful princes of the Roman Catholic party. The succession to his rich possessions and territories was disputed between John Sigismund, elector palatine of Pfalz, and John Sobieski, elector palatine of Neuburg, Philip Louis, a Calvinist; and Christian II., elector of Saxony, a Lutheran, but a friend of the emperor. Alarmed by this latter circumstance, the emperor of Brandenburg took upon himself the task to govern those duchies in common, until they could find an opportunity to settle this affair; and they immediately took possession of Jülich, Cleves, Berg, and the dependent counties. This act was declared by the emperor to be a breach of peace; he ordered the van the Lorrainers to be sequestered, and he appointed Leopold of Austria, bishop of Strassburg and Passau, to carry the measure into effect. He was assisted by the whole Roman Catholic party, which, alarmed at the loss of such a powerful member as the duchy of Cleves, concluded a union, to which they gave the name of the 'Liga' (11th July, 1609). This Liga was afterwards the strongest support of the emperor during the Thirty Years' War; Maximilian, duke of Bavaria, was on the head of it. So early as in the year 1610, the Union concluded an alliance with Henry IV. of France, and occupied the bishoprics of Würzburg and Bamberg. French troops entered the duchy of Jülich. But Henry seems to have found an opportunity of carrying into effect his designs of a possession of Brandenburg; he was murdered on the 14th of May, 1610. Frederick IV. died only five months later, and the Union concluded a peace with the Liga at Münich on the 24th of October, 1610. In the mean time a deadly personal animosity had broken out between the elector of Brandenburg and Wolfgang William, the son and successor of the count palatine Philip Louis, owing to their common government in the states of the late duchy of Cleves. Wolfgang William, in order to obtain an assistance of the emperor against Brandenburg, made himself a Calvinist for the purpose of obtaining the assistance of the Union, which was chiefly composed of Calvinist princes. The confusion which arose from sudden changes became still greater by the interference of the king of Spain, Philip III. This king became afraid of new religious troubles in his provinces of the Netherlands, situated on the boundaries of the duchies of Cleves and Jülich, since the death of the Protestant John Sobieski, to occupy them for the count palatine with a body of 30,000 Spaniards. But no sooner had his army entered these territories than the United States of the Netherlands, the barry war, with Spain, sent troops into the same countries under the pretence of opposing the interest of the king of Spain and the king of France, and of breaking the Liga (1614). This was the first example of a war between foreign powers being carried on in Germany.

The empire was now on the eve of a general war. It was generally expected that it would begin on the banks of the Lower Rhine, but, on the contrary, it broke out in Bohemia.

By a solemn declaration of the emperor Rudolph II., liberty of religion had been granted to the Ursulists, a numerous Protestant sect in Bohemia (9th of July, 1610). The document containing this declaration had the name of the 'Majestät's-Brief.' Civil troubles having broken out in Bohemia, and Rudolph II. having taken arbitrary measures to put an end to them, the Bohemians deposed him, and chose his brother Matthias king in his stead, in 1611. Rudolph II. died of grief in the following year, and Matthias likewise succeeded him on the Imperial throne (1612). The number of Luthers and Calvinists having greatly increased in Bohemia, the emperor's orders for the enforcement of the religious liberties with the Ursulists, Matthias refused to yield to these claims, and serious differences arose between him and the Lutherans and Calvinists Bohemians. They were joined by the Ursulists, who, according to the emperor's advice, might adopt the 'Majestät's-Brief.' Matthias sent commissioners to Prague, who assembled the deputies of the Bohemian states in the royal castle of the Hradshin, and declared to them that their king and emperor would not extend the 'Majestät's-Brief.'
Calvinists. Suddenly an armed party of Bohemian nobles, who belonged to the Utraquists, rushed into the room where the commissioners were assembled. They seized two of the commissioners, the counts Martinits and Bialwats, who were detested in Bohemia, and they and their secretary Fabricius were precipitated from the window and instantly killed, but a heap of dung prevented them from being dashed to pieces, and they all escaped and hastened back to Vienna. This happened on the 21st of May, 1618, and this day is justly regarded as the beginning of the Thirty Years War. In Bohemia, the insurrection was met by the firmness which the emperor manifested. He was known to the insurgents by no means an act of rashness or anger. The party of the Utraquists had previously resolved upon it, because they wanted to give the signal for an insurrection which had been secretly prepared among all the Bohemian Protestant princes, especially in Moravia, Silesia, and Lusatia, as well as among those of the archduchy of Austria. The insurgents immediately organized a regular administration of the kingdom. They also levied an army, which was commanded by the count of Thurn, and which was reinforced by a body of the troops of the Union, as ordered by Cardinal Montalto, prince of Anhalt, and the Emperor. They were attacked by the Bohemian, Ferdinand II., as mentioned above, and were defeated. The insurgents were finally completely routed at the battle of Parnawa on the 1st of November, 1619. In the meantime the count of Thurn had made great progress in Austria. In the month of July, 1619, he was already under the walls of Vienna, and, although this city was relieved, he remained in the possession of the adjoining counties. There he was joined by Bethlen Gabor, the sovereign prince of Transylvania, who had overrun Hungary and who took up his winter-quarters in Moravia, together with the count of Thurn. In the same winter (1619-1620) the new king of Bohemia made a defensive and offensive alliance with the Protestant insurgents of Hungary, and he proposed a similar alliance to Sultan Ahmed I. This imprudent and unpatriotic policy made his cause unpopular among all parts of Germany. Ferdinand II. took vigorous though arbitrary measures to recover Bohemia and her dependencies, those extensive and rich countries which are now inhabited by up to ten millions of people. The pope, the Spanish court, Bavaria, and even the Protestant elector of Saxony, promised their assistance to the emperor. In the autumn of 1620 the Lower Palatinate was occupied by the Spaniards under Spinola; the duke of Bavaria overran the Upper Palatinate and entered Bohemia; John George, elector of Saxony (since 1611), conquered Lusatia; and Austria was rescued by the emperor himself, who had made peace with Bethlen Gabor. At last the Bavarians, commanded by their duke and the celebrated Tilly, forced the Bohemians to make a stand on the Weisse Berg under the walls of Prague. There they were completely defeated on the 8th of November, 1620. Frederick fled from his capital, and after a short stay in his second capital, Breisach, he abandoned his kingdom and took refuge in Holland. In 1621 Bohemia, with all her dependencies, was in the hands of the emperor, who rewarded his ally, the elector of Saxony, with the province of Lusatia. He punished the Bohemians severely. A great number of nobles were beheaded, and their estates were confiscated; but an amnesty (quoad vitam et honorem) was given on the 4th of May, 1622, to all those who had not been condemned before. The Austrian and Bavarian ministers were banished, and their churches were shut up; but no harm befell the Utraquists, notwithstanding the Majestas-Brief was abolished. The Roman Catholics were restored to all their rights; and the university of Prague and the whole nation was put under the protection of the Jesuits. The emperor then put King Frederick under the ban of the empire, declared his election void, and proposed the duke of Bavaria to be chosen emperor. This proposition however gave dissatisfaction to the other electors, who considered the banishment of Frederick as illegal because the council of the electors had not formally pronounced it according to the constitution of the empire.

The power of the emperor increased so much by his conquest of Bohemia, and the Roman Catholic states were so much encouraged, that they claimed those bishoprics, abbeys, and churches which had been abolished by the Protestant Emperor and the Second Peace of Augsburg. Before the fate of Bohemia was decided, Christian IV, king of Denmark and duke of Holstein, several princes of northern Germany, and the ambassadors of England, Sweden, France, and the united States of the Netherlands, in agreement at Segeburg in Holstein for the purpose of forming an alliance against any ambitious schemes of the emperor. After the battle on the Weisse Berg, king Frederic also came to Segeburg, and claimed the assistance of the northern princes in order to recover his empire. These princes however had assembled exclusively for their own interests. The bishops of Liibeck, of Verden, of Schwerin, of Halberstadt, and several others had been bestowed on younger sons of the royal house of Holstein, and they delivered to them the promise that if the Roman Catholic party had power enough to take them, Frederic therefore found only one friend. This was Christian, duke of Brunswick and bishop of Hannover, who was a gallant man, and the wife of the unhappy king of the Bohemians, who was so detested that Emperor. With a strong body he entered the Palatinate. He was besieged by Tilly at Hildesheim (9th June, 1622). Christian now joined the count of Mansfeld, a man of great ambition, but not inclined to make himself so powerful as the emperor, as a means to escape from the empire. They plundered and robbed friends as well as enemies, but, pressed by Tilly, they disbanded their troops, and fled to England (December, 1622). Meanwhile the king of England had declared war against Bohemia, and, on the death of the latter king, was appointed protector of his son. Christian IV. of Denmark was to be a man of the House of Brunswick, and, though the greater part of the princes of this circle shortly afterwards made peace with the emperor, the king advanced into Hannover, where Tilly was ready to receive him (1625). The emperor was then in a very embarrassed situation. The war in northern Germany was carried on by the troops of the Liege, and principally by those of Denmark, commanded by Tilly, who was the same time commander-in-chief of the forces of the Union. The emperor of Bavaria had consequently an immense influence in public affairs; the emperor was obliged to cede to him the revenues of a part of his archduchy of Austria as an indemnification for the expenses in the war. On this occasion he raised his high command in the council of the Palatinate. On the other side, Ferdinand II. was threatened by the count of Mansfeld, who was then at the head of a strong army in the Netherlands, and who was ready to join forces with the other. The emperor then took Tilly's advice and joined Bethlen Gabor, prince of Transylvania. This prince had again taken arms against Austria, and there was only a small body of Imperial troops to check him. Albrecht of Walstein (Wallenstein), the hero of the Thirty Years War, as we have seen, had succeeded to the empire. Known as a skilful general, and in possession of very large estates, he was created duke of Friedland in 1626. In 1625 Ferdinand II. appointed him commander-in-chief of an Imperial army which did not exist, but which was created by Walstein in a very short time.
Waldstein advanced towards the Lower Elbe, and took a fortress at Dessau. On the 13th of April, 1628, Mansfeld was beaten; on the 24th of the same month he was put to the route. He reinforced his army in Mecklenburg, and in June invaded Silesia with 30,000 men. Waldstein, marched in a parallel direction, and weakened his enemy by skirmishes. On the 8th of September Mansfeld was on the banks of the Weser in north-western Hanover, with only one-fourth of his army, while Waldstein with fifty thousand was in possession of Darmstadt. The latter made peace with the emperor, and Mansfeld, leaving the remainder of his army to the command of John Ernst, duke of Saxe-Weimar, fled to Venice, but died on his way. In a village in Dalmatia, Christian of Halberstadt, his fellow-adventurer, had died before him, in the 27th year of his age.

While Waldstein was victorious in eastern Germany, Tilly carried on the war in the country west of the Elbe against the king of Denmark. In consequence of a fall from his horse, which had affected King Christian’s mind to an alarming degree, he firmly believed that God had chosen him to be the champion of the Protestant religion. But half of his army was destroyed by the skillful manœuvres of King Christian of Denmark, under the command of his chancellor, the duchy of Mecklenburg, and a part of the army under the command of the late dukes of Mecklenburg, was destroyed on the battlefield of the Weser. The result of these campaigns was the destruction of the Protestant forces in the northern states.

In the following year (1627) besieging and taking the towns on the left side of the Elbe, which were occupied by Danish garrisons. In the month of July he was joined by Waldstein, who, after his victories over the Spanish, saw the possibility of being master of the east of the Elbe. Waldstein, after having put the duke of Mecklenburg to flight, attacked the king of Denmark, who had assembled a new army (1628), and in one campaign his troops conquered all the continental possessions of the Danish king. The civil troubles which had continued before the end of the year. A congress assembled at Lübeck, and on the 22nd of May, 1629, Waldstein granted peace to the king of Denmark, on conditions unexpectedly favorable: Jutland, Slesvig, and Holstein were restored to the king, who promised not to interfere in the German affairs nor to make any further claim on bishoprics on behalf of his kinsmen. Immediately after the peace of Lübeck, Waldstein was invested with the dukedom of Mecklenburg, the other having previously been dispossessed and taken from the hands of the emperor for their adherence to the king of Denmark.

One of the most remarkable events in the Danish war was the siege of Stralsund on the Baltic, a town which belonged to the union of the Hanseatic towns. After the death of the king of Denmark, it was ceded to the duke of Pomerania. Stralsund, being occupied by a Danish garrison, it was besieged by the troops of Waldstein, who conducted the siege during the months of June and July, 1628. On the 14th of July the town capitulated; but before the Imperial troops had taken possession of it, a Swedish fleet appeared off Stralsund, and landed a strong body of troops, who took possession of the fortress. Although the inhabitants of Stralsund had promised obedience to the emperor, the Imperial troops were not allowed to enter the town, which remained under the command of a Swedish general. Of this most unfair and inhumane interference on the part of the Swedes, Waldstein was previously aware; and this was one of the reasons why he allowed such favourable terms to the king of Denmark at the peace of Lübeck; another cause was a daring design of the emperor on the liberty of the Protestant religion. Encouraged by the success of his armies, and misled by impostors, the emperor, under the pretence of protecting the Roman Catholic religion in the Second Peace of Religion, all the bishoprics, abbey, and churches which had been taken from the Roman Catholics, was restored to them; and the Roman Catholic possessors of Protestant territories should not be hindered from the enjoyment of the privileges granted by the Jus Reformandi. The ecclesiastical states which had been ceded to members of the house of the elector of Saxony, who was still an ally of the emperor, were alone excepted from this ordinance. If the Edict of Restitution had been carried out, the entire civil war would have been the immediate consequence; but it met with much opposition. Only a few Protestant bishoprics were conferred upon Roman Catholic princes, and the legal execution of the Edict was made dependent upon the arbitration of the general assembly of the states. This meeting was called the Day of Composition, and was fixed for the month of February, 1631.

The religious troubles seemed now to be nearly at an end. All the states adhered to the Peace of Madrid, and the emperor’s counsellors, who were for peace; and all hoped that this peace would be settled on the Day of Composition. The Protestant party was still powerful enough to obtain favourable conditions for their religion. The emperor’s power had much increased, and the ambition of his counsellors to obtain the dignity of emperor, would have been the consequence of success in either of his ambitious designs. (Extracts of documents contained in Breyer, Beiträge zur Geschichte des Dreißigjährigen Krieges, pp. 210, 219, 221, 252.) France, then weakened by the late Spanish war, and by the attack of Sweden, was obliged by necessity to make peace. The French king, who had been driven from Germany by the Emperor, was now upon the point of again making war on Germany, and his minister, Richelieu, employed every means in his power to persuade the king of Sweden to make the first attack. Gustavus Adolphus, being then at war with the Poles, Richelieu tried to negotiate a truce between the belligerent powers; but the emperor, anxious to prevent any such peace, sent his general, Armheim, to Poland, with those troops who had been employed in the siege of Stralsund. Although the Swedes were the first to violate the truce stipulated at Lübeck, they nevertheless considered the assistance which the emperor gave to the Poles as a declaration of war. But, instead of attacking the hereditary states of the emperor on the Polish frontier, Gustavus Adolphus, by the same treaty, arranged for the Polish king’s cession of the Swedish fleet with the king of Poland for six years, at Altmärk, in the month of September, 1629. He then made great preparations for an attack on the German countries along the Baltic, and ordered his fleet to blockade the towns of Wis- mar and Rostock in Mecklenburg, which were occupied by the troops of Waldstein. The king of Sweden was the more active because he was checked in his designs on the Baltic by Waldstein, who had assumed the title of Imperial admiral of the Baltic, and who, by means of the Hanseatic towns, wished to restore the supremacy of the German navy in the northern seas. But, having been deprived of his military command by the emperor in 1630, Waldstein saw himself compelled to defer the execution of this project. In the meantime the French subsidies enabled Gustavus Adolphus to be ready for the new war as early as the spring of 1630. On the 24th of June he landed 16,000 men on the island of Ue- dom, on the coast of Pomerania. He styled himself himself Protector of the Protestant Faith, and came to Germany at a moment when the princes were assembled at Regensburg for the purpose of settling their religious affairs, and when the Protestant party itself had sufficient power to protect its faith. The first act of Gustavus Adolphus was to compel Bogislaw, the son of the Elector of Pomerania, to appear in his camp, and to surrender to him his capital, Stettin, a town equally important by its fortifications and by its situation near the mouth of the Oder. He then gradually occupied all Pomerania, and on the 13th of January, 1631, concluded a treaty with France, by which
he engaged himself to carry on the war against Austria with 16,000 cavalry and 30,000 foot, on the condition of an annual subsidy of 400,000 thalers. Meantime he summoned the Protestant princes to join him, but when assembled at Leipzig (10th of February to 12th of April, 1631) he was informed that Wallenstein was an intruder in Saxony. But they promised to assist the emperor with all their forces. George, duke of Brunswick Lüneburg, was the only prince who joined the Swedes, in the hope of obtaining some ecclesiastical territory as an addition to his hereditary states. Thus deceived in his hopes, the protector of the Protestant faith attacked George William, elector of Brandenburg, who was his brother-in-law and one of the first Protestant princes of the empire. He compaigned under his father-in-law, Caspar, and he then made an alliance with the city of Magdeburg.

This rich and populous Imperial town joined the Swedish party for the purpose of escaping the danger of being occupied by the Imperialists, who were ordered to march with that fortress against the Swedes. For this conduct Magdeburg was put under the ban of the empire. Tilly having been charged to execute the ban, and to take the town by force, the citizens of Magdeburg hoped to be rescued by the king of Sweden, who had promised his assistance, but Gustavus durst not advance as far as the Elbe, unless his rear was secured by an alliance with the electors of Brandenburg and of Saxony. Magdeburg was taken by storm by Tilly and Pappenheim, whose troops plundered the town for many days and obliged Gustavus to retire (12th of May, 1631). The unhappy fate of this opulent town was made the subject of a charge against the king of Sweden, who however had gained much influence over the princes of Germany in consequence of that his partial credit was not weakened by this event. He forced the elector of Brandenburg to conclude an alliance with him; he drove the Imperial garrisons from Mecklenburg, and restored the dukes; and he ravaged the electorate of Saxony until the elector surrendered his towns, and concluded a defensive and offensive alliance with Gustavus Adolphus (14th of September, 1631). Previously to this, William V., landgrave of Hesse-Cassel, had voluntarily attached himself to the Swedes for the sole purpose of profiting by the confusion into which the empire was thrown by their interferences. Bernhard, duke of Saxe-Weimar, offered his services as general to Gustavus Adolphus, and he was immediately put at the head of a part of the Swedish army.

While the king of Sweden thus had his power increased by the forced or voluntary adherence of the princes, Tilly reinforced his army, and occupied Leipzig. But on the 17th of September, 1631 (N. S.), Tilly lost the battle of Leipsic against the united forces of the Swedes and Saxons; and such was the disproportion of his numbers and military skill, Gustavus Adolphus found no enemy to oppose his march to southern Germany. However, instead of invading the hereditary states of the emperor, the king of Sweden concentrated his victorious army at Würzburg in Franconia, which he intended to keep for himself. He there took the archbishopric of Mainz and the Palatinate, but did not restore it to its legitimate master, the banished king of Bohemia, Frederick V. At last he marched to Bavaria, and forced his way across the Lech after a bloody victory over the Bavarians, who lost their general, Tilly (5th of April, 1632). Augsburg, a free imperial town, was forced to pay homage to Gustavus Adolphus, who on the 21st of August, after his entrance into Munich, the capital of Bavaria. During this time the Saxons made a temporary alliance with the Swedes, had occupied a considerable part of Böhemia and Silesia. The great designs of Gustavus Adolphus now became manifest. He proposed to George William, elector of Brandenburg, that Frederick William, the elector's son, should marry his only daughter Christina. Frederick William was then to become master of Sweden, Finnland, Ingermanland, Estonia, Livonia, Curland, Prussia, Brandenburg, the three bishoprics of Bamburg, Würzburg, Mainz, Magdeburg, Halberstadt, Speier, and Worms, of the Palatinate, and of all the countries which the king hoped to conquer in southern Germany. But this brilliant offer was refused by George William. It is said that this refusal was a sanguine Calvinist, would not allow his son to become a Lutheran. But another condition of this marriage being to assist the king of Sweden in his designs on the Imperial crown, it seems that the elector refused the proposal, because he would not make himself the instrument of Swedish ambition.

The emperor was then in the utmost extremity. He had no army to oppose to the Swedes, and if he had one, the only general who, after Tilly's death, had shown himself capable of opposing the king of Sweden, Wallenstein, had been deprived of his rank as commander-in-chief and had become a deadly enemy of the emperor. Forbath was obliged to humble himself before him and at last, having declared his renunciation of the pursuit of the Imperial army, not as its general, but as its supreme and independent master. This army however did not exist, but was to be created by Waldstein.

When Gustavus Adolphus occupied Münstcr, Waldenstein had assembly there under his fortifications, with which he expelled the Saxons from Bohemia. The defeat of the former obliged the king of Sweden to relinquish the attack on Austria, to leave Bavaria, and to hasten to the assistance of Saxony, then exposed to the victorious Imperial army. He made a stand at Nürnberg, in order to observe the Imperial army (January, 1632). In the month of July Wallenstein arrived at Fürth, near Nürnberg, and took up a strong position, by which he checked the king, and intercepted his supplies. In the battle of Lützen, 30,000 Swedes, who had engaged in a battle with the Swedes, was however defeated by the Swedish army. Gustavus Adolphus assaulted the camp of his adversary on the 24th of August, but his troops were driven back with great slaughter; and the king, seeing his army exposed to hunger and disease, left his camp on the 9th of September to save the remains of his army, and lowered him, and in the month of October both the armies were in Saxony. Waldstein divided his army into two bands, in order to enter into winter-quarters, thinking that the forces of the Swedes would be so dispersed as to be unable to prevent the march of his army. The death of King Gustavus Adolphus, who was killed; and the battle was gained by Bernhard, duke of Saxe-Weimar, who immediately took the command of the Swedish army. Waldstein retired to Bohemia, where he remained, extremely inoffensive, although he soon repaired his losses at the battle of Lützen.

The death of Gustavus Adolphus did not lessen the power of the Swedes, nor change their politics: the chancellor Osterstein directed their affairs with the same success and the same skill and wisdom which characterized his illustrious predecessor, Bernhard of Saxe-Weimar, one of the most distinguished captains of his time. In 1633 Osterstein concluded an alliance with the states of the empire: the Dutch, who held the upper Rhine, and of the Lower Rhine, and duke Bernhard granted the Swedes, of whom Frederick V. was afraid of the dangers to which Germany was exposed by the Swedish protection of the Protestant church. But Waldstein, whose pride became unbearable, and whose policy was crooked, was accused of high treason by his numerous enemies; and he was assassinated in the midst of his army, on the 26th of February, 1634. Ferdinand of Austria, the son and heir of the emperor, succeeded Waldstein as commander-in-chief of the Imperial and Bavarian armies, under command of John von Wurtz, both experienced generals. Reinforced by a large army of Spaniards he attacked the Swedes at Nordlingen, on the 7th of September, 1634. The Swedes were routed, their general, Horn, was made prisoner, and southern Germany was left to the mercy of the victorious enemy. The next year the emperor sent heavy contributions from the Protestant inhabitants, respected the liberties of the Protestant church. The Protestant princes of southern Germany, who hoped to receive additional assistance from the Swedes, were disappointed by the defeat of Gustavus Adolphus, who found another powerful ally, who was always ready to encourage the German princes in their rebellious undertakings against the authority of their emperor. This ally was France, who, with the view of reducing the empire of Baden, negotiated an alliance between them.
The king of France being one of the first Catholic princes, he durst not assume the title of protector of the Protestant church, as the king of Sweden had done, and he therefore styled himself the protector of the liberties of the people against the tyranny of the emperor. His policy was never to yield or give ground; but this book was burnt in Paris by order of the Sorbonne. Duke Bernhard of Saxe-Weimar at the same time had sold himself and his army to Saxony, Saxony and Brandenburg saw at last that any longer adherence to the Swedish alliance would be the ruin of their peace. They might have concluded peace with the emperor on the 30th of May, 1685, at Prague; and Brandenburg gave in its adherence to this peace on the 27th of August following: the favourable con\n
\ntainment, the Swedes were thus left free to proceed with their unbridled course, and to devastate the German states with all the license of an army in a state of war.

The most important event from the year 1635 to 1639 was the conquest of Alsace by duke Bernhard of Saxe-Weimar, who hoped to possess that Austrian province as an hereditary duchy. His plans however were not contrary to the policy of France, who herself aimed at the possession of Alsace in the duchy of Wurtemberg. The emperor however employing him as an instrument. No sooner had the duke's intentions become manifest, than he fell suddenly ill, and died on the 8th of July, 1639. His army, a strong and experienced body, was bought by France, who immediately took advantage of the weakness of the emperor, and, reinforced by the Saxon troops, gained a victory at Haselau\n
under the Swedish general Knyphausen, who was killed (December, 1635); and they forced Magdeburg to surrender (1636). They and the Saxons were beaten in their turn at Wittstock by the Swedish general Baner (24th of September, 1636); and duke Bernhard defeated them at Rheinfelden (21st of February, 1638), and made prisoners generals Savelli and the celebrated John von Werth. Previously to this the emperor had been blindsfolded (28th of February, 1637), and was succeeded by his son Ferdinand III., who had been king of the Romans since 1636. Leopold William, the brother of Ferdinand III., was appointed generalissimo of the Imperial army; and as early as the first of May, the Imperial army was almost at the gates of Baner, from Bohemia, and he pursued them as far as Hesse and Hanover. In the autumn of 1640 the emperor issued a proclamation, granting to the rebellious Protestant princes a general amnesty and the sovereignty over their territories, to the status quo of 1626, and over their ecclesiastical territories on the status quo of 1627. But these princes treated the proclamation with neglect, still hoping that by their alliance with the foreigners they would escape the consequences of their rebellion. They sent new contingencies to the army of Baner, who, in January, 1641, advanced as far as Regensburg. He was reinforced by a French corps, commanded by the Marshal de Guise, but their united forces were defeated by the Imperialists, and on their retreat they lost half of their troops. Baner died in the month of May, 1641, and his successor was Torstenson, who led the Swedes to new triumphs.

The war had now lasted for twenty-three years, Swedes, Danes, Spaniards, Dutchmen, Frenchmen, half-savage warriors from Hungary, Transylvania, and Croatia, had crossed the borders of Germany to foment seditions in all the countries of Europe flocked to Germany to learn warfare, and to enrich themselves by the plunder of the country. The foreigners pretended to protect the churches, but the churches were laid in ruins; they pretended to defend the princes and their possessions; but they deserted them; they promised to maintain the privileges of the princes, and they robbed them of their dominions, and led them to disobedience and anarchy.

Before the war was ended, it was said that they were on the eve of a religious contest, but they hesitated to believe it; no deep religious hatred, no fanaticism disturbed their domestic peace. After the war had lasted some years, their passions were roused, and their warlike spirit excited them to take up arms, some for the defence of their hearts, and others to follow Waldeisen or any other leader of the time. The pretext which the princes made of religion was shown by their attacks on the property of the church, and thus the people lost their respect for the church. This was especially the case with the province of Mansfeld, of Waldeisen, who supported their armies by robbing indifferently Roman Catholics and Protestants, corrupted both peasants and citizens; and commerce and agriculture were in a most miserable condition. The princes of Mannheim, the Swedes, had left in the town a garrison of 1000 men, which to the emperor was a perfect military organization. They were divided into regiments, companies, and sections, each body being commanded by a prostitute, and the women having the same rank among these female adventurers which their lovers had in the army. The provinces which were the principal theatre of war were laid waste, and the inhabitants fled, or were killed, or died of hunger and disease. Of 500,000 individuals, the population of Hesse in 1618, only 45,000 remained at the end of the war in 1648.

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Torstenson, the new generalissimo of the Swedes, conquered, or rather traversed, in the spring of 1612, Saxony, Silesia, and Moravia, and his light horse appeared before Prague. At the same time the Marshal de Guise, while the Generalissimo of the Imperialists, who, in the army of Waldeisen, had a perfect military organization. They were divided into regiments, companies, and sections, each body being commanded by a prostitute, and the women having the same rank among these female adventurers which their lovers had in the army. The provinces which were the principal theatre of war were laid waste, and the inhabitants fled, or were killed, or died of hunger and disease. Of 500,000 individuals, the population of Hesse in 1618, only 45,000 remained at the end of the war in 1648.
France had levied a new army, which was put under the command of Turenne, and which was reinforced by a body under Louis d'Enghien, afterwards prince of Condé. They attacked the Imperialists under Mercy, who, after a gallant resistance and various successes, was at last obliged to retire to the east of the Black Forest, leaving the Palatinate, Alsace, and Baden in the hands of the French (autumn, 1644). The Imperialists were still more unfortunate in eastern Germany. Turenne defeated them and the Saxons at Jankaau in a battle fought on the 10th of March, 1645, and their general, Watzfeld, was made prisoner. In one campaign Turenne made himself master of Silesia and Moravia, and encamped near Vienna; and his lieutenants, Königsmark, conquered the bishoprics of Bremen and Verden. The elector then made the emperor feel the blow of magisterial interference. Frederick William, who had succeeded his father George William in 1640, renounced their alliance with the emperor, and made their separate peace with Sweden; and their expediency for the elector of Bavaria. This hitherto faithful ally abandoned the emperor in 1647, after the victory of Turenne at Allerheim, and after the conquest of Swabia by Turenne, who advanced towards Mülnich. The defection of the elector of Bavaria excited the discontent of his army, and was considered an act of high treason by his generals. John von Werth, the idol of the soldiers, conceived the plan of putting the Bavarian army under the command of the emperor, and of seizing the elector and his ministers for the purpose of confining them in their own strongholds. The plot was betrayed to the moment when it was to have been carried into effect. But John von Werth escaped, and Ferdinand created him a count of the empire. This event was followed by a victory of the imperialists at St. Michael of the Saale at Auersberg (20th May, 1648). Königsmark, their general, now invaded Bohemia, and on the 31st of July conquered that separate part of Prague which is called the Klementice. This conquest was the last important event of the Thirty Years War, which began and ended at Prague.

Peace of Westphalia.—As early as 1640 the Diet at Regensburg was occupied in putting an end to this awful war, and in 1641 preliminaries were prepared at Hamburg under the mediation of Denmark. Mülnster and Osnabrick were afterwards chosen for the purpose of conducting the meeting and to be held in the spring of 1642, but it was not organised before the spring of 1643. The count of Auersberg was the emperor's ambassador at Osnabrick, where he was to negotiate a peace with the Swedish ambassador, John Adler Salvius; and the count of Nassau met at Mülnster the count d'Avour, the ambassador of the king of France. The states of Germany sent likewise ministers or agents to both these towns; ambassadors of France and Bavaria represented the pope and the other Catholic powers; and the English and the United States of the Netherlands sent their plenipotentiaries for the purpose of settling their private differences, and interfering in those of Germany. The negotiations lasted three years; the various chances of the war, and the political state of the parties, naturally led to the adoption of a double principle, and the troublesome intervention of the German States were an obstacle to private interests being made subordinate to the general interest. At last the count of Trautmannsdorff, 'the most honest among all the ambassadors,' arrived from Vienna with full powers, and on the 14-24th of October, 1648, a double peace was concluded at Mülnster and at Osnabrick, which was legally considered as one, under the name of the Peace of Westphalia, and by this Spain ceded to this Spain and the United States of the Netherlands had likewise made peace at Mülnster, on the 20-30th of January, 1648. These are the principal conditions of the peace of Westphalia:

I. Conditions concerning the cession of territories and rights to foreign powers.

1. Sweden, an indemnification for her expense in the war and for ending several of her conquests to the former possessors,' acquired Pomerania, except a part of Pomerania Citerior (duke Bogislaw XIV. had died in 1637); the town of Wismar in Mecklenburg; the archbishopric of Magdeburg, and the bishoprics of Osnabrick as hereditary duchies; a sum of five millions of thalers, which was not to be paid by the emperor, but by those states where Gustavus Adolphus had promised to protect the Protestant church. In respect of these terms Sweden became a member of the empire.

2. France acquired the sovereignty over the bishopric of Metz, Toel, and Verdun, the possession of vital bases, and the power of putting a garrison in the French towns of Pignerol, the town of Breslau, and the skill of keeping a garrison in Philippsburg; the landgraves of Upper and Lower Alaisce, the Sontgau, and the imperial rights over ten free towns in Alaisce, but not over Hanau. These territories were ceded to France in sovereignty, and the king of France consequently did become a member of the empire.

3. The United States of the Netherlands and the secession of the cantons of Switzerland were acknowledged by the emperor as independent states; legally speaking, these countries were parts of Germany until the peace of Westphalia.

II. Conditions concerning the cession of territories and rights to members of the empire.

These indemnifications were effected by renouncing bishoprics and other ecclesiastical territories.

1. Hesse-Cassel acquired the abbey of Herfstadt, seven of the fiefs of Schauenburg, and six hundred thousand thalers which were to be paid by Roman Catholic bishoprics.

2. Suabia acquired the bishoprics of Fulda, Fuldah, of Minden, and of Camin, as hereditary principalities; and the archbishopric of Magdeburg as an hereditary duchy.

3. Mecklenburg acquired the bishoprics of Hamburg and Stralsund, and as hereditary principalities, the commanderies of Minor and Nemを使用, which were taken from the Knights of St. John.

4. Brunswick acquired the convents of Walsern and Groningen, and the privilege of appointing a prince of the reigning house bishop of Osnabrick; on the same condition, however,—that the bishopric was to be granted alternately by a Protestant bishop of the House of Brunswick, and by a Roman Catholic bishop, who was to be chosen by the chapter.

5. The Duke of Bavaria was confirmed as elector, and rewarded with the Upper Palatinate and the county of Cham.

6. Charles Louis, the successor of the deposed elector palatine Frederick V., was restored to his dominions except that part of them which was ceded to Bavaria; and as the electorship of his father was forfeited, an eighth electorship was created and bestowed upon him.

III. Conditions concerning religion and the constitution of the empire.

The principle of these conditions was a general amnesty with regard to those who had rebelled against the emperor, though the word 'rebel' was not employed; and the maintaining of the status quo of 1618, but the beginning of the Bohemian war, with regard to the religious question, was enshrined in an inviolable clause, &c., which was seized by either of the parties.

A. Religion.

1. The treaty of Passau and the Second Peace of Passau were confirmed.

2. The religious quality of a territory or state was to be decided after the status quo of the 1st of January, 1624 (N.B.).

3. Equality of political rights between the Roman Catholics, the Lutherans, and the Calvinists or Reformed.

4. The Jesuits were reduced to the same meaning as a mere protection of religion. This principle was checked by numerous and explicit exceptions, which afterwards led to many complaints.

5. The ecclesiastical jurisdiction of the bishop was conferred upon the Protestant princes as a right of sovereignty; in the Roman Catholic territories it remained in the hands of the bishop.

B. Constitution of the empire.

1. The princes acquired the right of concluding separate defensive and offensive alliances with foreign powers, and they became almost sovereign with regard to the subject of the Empire, which was afterwards given to many complaints.

2. The German empire was changed into a kind of confederacy of almost sovereign states, the emperor becoming a mere director of the public affairs.
IV. Conditions concerning the relations between Germany and foreign powers.

1. The peace of Westphalia was guaranteed by Sweden and France.

The Thirty Years War was the Peloponnesian War of Germany, and the Peace of Westphalia the German Peace. From ancient days, the German princes were the downfall of the empire. The German princes were originally rich landowners appointed by the emperors as high judges (graven, counts) and military commanders (herzog, duke). From the eleventh century they endeavored to obtain powers and privileges which the emperors were compelled to confer upon them in due form. Both legislation and administration became hereditary in the princes. Having succeeded with regard to political rights, they considered the Reformation of Luther an opportunity of usurping ecclesiastical legislation. It was granted to a great number of them by the Peace of Westphalia. Luther's reforms came to the Protestant faith, but this faith required to be supported by a church. Protestant church did not exist before the Peace of Westphalia, nor was it established by this peace, nor is there any general Protestant church in Europe now. The princes considering themselves as legal successors of the emperors, the episcopal rights became a part of political sovereignty, and the ministers of the faith gradually assumed the military and civil whitens of the emperors. They obeyed them; they not only obeyed, but they, who had and established the soldiers of their temporal authority, they conflated the commands of their faith with the laws of their princes, and, not discovering any divine character in these laws, they forgot the divine origin of their religion. Thus they fell into that condition in which the princes kept at arm's length, to supply the place of the emperors, and the state or court prevail in the greater part of the Protestant countries of Germany. This religious state is a consequence of the Thirty Years War. The political consequences of that war is still more evident. Germany was a wilderness—its material strength as ruined—as its political power was broken—its intellectual development was checked—and the fierce and manly spirit of the nation was broken by their thousand arbitrary and automatic, decreed, and decreed the German princes to divide into factions by the private interests of the princes, and the religion, the theatre where the armies of all Europe to see and settle the differences of their kings. This state of kings lasted a hundred and fifty years, and ended with the dissolution of the empire. The German princes, however, have been ruled by the original rulers, and to that extent, they have not been as a produce of different species of thistles. Their receptacles and stamens of the Cotton-Thistle are sometimes eaten, in the same manner as the artichoke and cardoon. 

The name Cardus, Plume-Thistle, is known by the feathered down that crowns the seeds. It is a large genus: nine of the species are inhabitants of Great Britain. The Cotton-Thistle is the Onopordon, which is known by its honeycombed receptacle. The O. Acanthium is a British species. The leaves are ovato-oblong, spinous, and spinous, and resemble the thistles. The artichoke and cardoon are called, however, different species of thistles. The receptacle and stamens of the Cotton-Thistle are sometimes eaten, in the same manner as the artichoke and cardoon. 

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the perennial kinds must be ploughed and the roots picked out. The *Carduus arvensis* has got the name of Cardes Thistle, on account of the difficulty of eradicating it where it has once grown. Although injurious to man, by exhausting the soil of that nutrient which plants supply, and which, not only by nourishing the place of more useful plants. There are many varieties of the thistle, some of which are not destitute of elegance when in full blossom. Considered as a weed in our fields, our parsimony will eradicate it, and in consequence, when the ready dispersion of the seeds by the wind, is not easily done, as a slovenly farmer may seed the whole country round; and where the thistles are not eradicated from the hedges and sides of roads and paths, it is impossible to destroy them entirely: wherever the soil is newly turned up, especially when it is of a nature where wheat will grow well, thistles invariably arise: hence the saying of the blind man in choosing land, 'Tie me to a thistle.'

Those crops which are usually had and can readily be cleared of thistles: but where the seed is sown broadcast, the labour of weeding them out is much greater. If they are not extracted with the root, they will soon grow again with redoubled vigour. In a moist season they may be pulled up as a wood of a country forces, ten to grasp them strongly near the crown of the root, and, as it has a projection which serves as a fulcrum, a pressure on the handles draws the root out when they are brought together. When a field has been long infested with thistles, the best way of clearing it is, to sow, when the thistles are in full blossom and the seed is just forming; if it be then cut off at the root it will die. Thus in two years a field may be entirely cleared of thistles.

It is chiefly in arable and meadow land that thistles are most troublesome. In pastures it is sufficient to eradicate them once, and to permit none to grow along the hedges and ditches. The seed does not readily vegetate, unless it finds a loose soil; and little birds are so fond of it, that they will leave none that is not covered with earth, especially in the beginning of winter. In some countries there are penalties inflicted on those who allow thistles to remain in their hedges or along the high road which borders their land; and a man may complain to a magistrate of a neighbour who will not destroy the thistles on his land, when the delinquent will be admonished or fined, as the case may require. Such a law would be very advantageous in many parts of the country, where no attention is ever paid to the weeds that grow along the hedges or roads.

THISTLE, ORDER OF THE, an ancient Scottish order of knighthood, sometimes called the order of St. Andrew. The early history of this order is involved in some obscurity, and the most absurd attempts have been made to claim it to high antiquity, of which there is sufficient to allure to the legendary account recited in the warrant for the restoration of the order in 1687, and given most minutely by several Scottish antiquaries, attributing its formation to Achacia, king of the Scots, in commemoration of a victory obtained by himself and Hrugus, king of the Picts, over Athelstan, Nicolas observes, as a just illustration of this legend, that Achacia died upwards of a century before the reign of Athelstan; and he observes, that the thistle was the acknowledged badge or symbol of Scotland until the latter part of the fifteenth century. Even after it became a national ornament, and formed a distinguishing feature of a collar resembling that worn by Knights of the Thistle, it is by no means certain that it was considered the badge of an order of knighthood; and the searching investigation of Sir Nicholas Harris Nicolas, which is detailed at great length in the third volume of his recently published 'History of the Thistle' in the acknowledged badge or symbol of Scotland until the latter part of the eleventh century. Even after it became a national ornament, and formed a distinguishing feature of a collar resembling that now worn by Knights of the Thistle, it is by no means certain that it was considered the badge of an order of knighthood; and the searching investigation of Sir Nicholas Harris Nicolas, which is detailed at great length in the third volume of his recently published 'History of the Thistle,' leads him to the conclusion that it is difficult to believe the existence of the Order of the Thistle, as an organized fraternity, until the reign of James VII. of Scotland and II. of England. Whether it had any such prior existence or not, it certainly is established by the assurance of the antiquity of the order themselves, that, after the Reformations, orders of knighthood being considered in Scot-
Penny Cress, have a strong allusive odour. They grow on rocks and barren places, and are frequently found along the coasts of the Mediterranean, inhabited by the small inhabitants of most parts of the world in cold and temperate regions.

Hutchinson was named by Sir J. E. Smith after Miss H. E. D. Hutchison, a celebrated British marine botanist. It is a marine plant of the 'English Botany.' It has an elliptical siliqua with wingless valves, equal petals, entire leaves, bractless pedicels, and variously-coloured flowers, but never yellow. All the species are mountainous plants. They possess the power of propagating by seeds, by the root, and by cutting, and will grow on rock-work or in small pots. They are best grown in a soil composed of sand, loam, and peat. The annual kinds may be propagated by seeds; the perennial, by dividing the roots or by cuttings. The color of its petals being larger than the other two; they are of a white or purplish colour, but never yellow. They are mostly mountainous plants, but grow well in gardens; and, if the seeds are sown at different periods, will blossom all the summer, and even through a mild winter. The shrubbery species are also well adapted for rock-work, and may be propagated by cuttings. [Ibid.]

Biscutella has a flat siliqua with one-seeded cells, a larger siliqua with one seed, a compressed seed, and yellow scentless flowers. They are also alpine plants. In the garden they form a pretty variety with the other plants, on account of their yellow flowers. A dry sunny situation in a cool part of the garden is peculiarly suitable for them propagated by seeds, and may be kept in blossom during the summer by sowing at different periods of the year.

THOA, a genus of Polyiparia; included by Linnaeus in Sertuliaria.

THOMAS, θωμᾶς, ΝΩΝΙ (in Greek, Διδυμός; John, xi. 16; xx. 24), one of the twelve apostles of Christ. [Matt., x. 3.] The Hebrew and Greek names both signify 'a twin;' St. Thomas is presumed to have been a Palestinian, but his exact place of birth is unknown. The apostleship is given, and the first notice of him individually is in John, xi. 40. Christ having expressed an intention of returning to Judah, in order to raise his friend Lazarus from the dead, Thomas encouraged the other apostles to attend him, although he regarded death as the certain consequence of this step. The impulsive character of such instruction was not long after very differently displayed. Thomas happened to be absent when Christ was crucified, and his desire soon after his birth was to return to the apostleship. Thomas did not visit Palestine at this time, but when he made acquaintance with the fact, he expressed an incredulity which could only be satisfied by the manual evidence of inserting his finger in the holes which the spear had made through the body of his crucified master. Eight days after, when Christ again appeared, Thomas was present; and the reaction in his mind was very strongly expressed by him, when he pointedly called upon Jesus to stretch forth his hand and take the desired proof. (John, xxi. 24-29.) Thomas is not again mentioned in the New Testament. Doubtless he laboured, like the other apostles, in the propagation of the Christian doctrines, and ecclesiastical traditions make him one of the apostles of the Gentiles. It is alleged that he travelled eastward, and laboured among the various nations which then composed the Parthian empire. (Euseb., iii. 1; Rufin., x. 9; Recognit., ix. 29.) There is a singular concurrence of Oriental and Western testimony (which may be found in the annals of the Missionaries) to the effect that St. Thomas extended his labours farther eastward, and then southward, until he reached the coast of India and Malabar, where, having exercised his apostolic labours with success, he passed on to the coast of Coromandel; and having made great conversions to the faith in those parts, he proceeded over to some coast on the east, called China (which may possibly have been the country now called Cochin-China), and afterwards returned to Coromandel. From this last point of his labours, he was buried in the mount since called St. Thomas's Mount.

In the quarters indicated there are Christian churches which bear the name of St. Thomas, and claim him for their founder. If they derive their existence as a church uninterred from this age, this claim may be regarded as a corroboration of the above traditions, but if the effects which resulted among them from the labours of Mar Thoma and other Nestorian missionaries, at the commencement of the tenth century, were really acceptable conversion, or at least a re-conversion, and not, as is often supposed, the revival of a fallen but not extinct church—then this claim is to be regarded only as an echo of the tradition which has always prevailed in the Syrian churches, and which must be estimated by its intrinsic probability and value.

(Besides Asemann and Baronius, see Tillemont, i. 397; Cave's Antiq. Apostolica; Winer's Biblieches Real-Worterbuch, and Budge's Contributions to the Study of the History of Egypt; Yeate's Indian Church History; and Principal Mill's Letter to the Society for the Propagation of the Gospel (July 29, 1822), inserted in Christian Remembrances for November, 1823.)

THOMAS A'KEMPIS. [KEMPIS.]

THOMAS AQUINAS. [AQUINAS.]

THOMAS, ANTOINE LE'ONARD, was born at Clermont in Auvergne, on the 1st of October, 1732. His father, it has been generally believed, died while Thomas was an infant, leaving a widow with three sons and a daughter. The eldest son, Joseph Thomas, who embraced the clerical profession, died in 1741; he composed a dramatic piece, entitled 'Le Plaisir,' which was acted with much success. His brother, Antoine, became professor in the college of Beauvais; he published some Latin verses, and introduced into his college an improved method of teaching Latin. It appears therefore that the taste for literature was found in his family. Antoine Le'ondard was educated at home till he had completed his ninth year, and was then sent to prosecute his studies at Paris, where his brothers preceded him. In a letter which he addressed, in 1767, to Madile. Moreau, he mentions that his second brother succumbed to great pains with his education. They were an attached family: Antoine retained all his early devotion for his mother till her death, in 1782; and his sister, the only member of the family who survived him, lived with him till his death.

Antoine Le'ondard was graduated at the university in 1747, he carried off two of the prizes distributed in his class in the college of Duplessis: in 1748 and 1749 he studied rhetoric in the college of Lisieux, and obtained four prizes: from October, 1749, to August, 1751, he studied philosophy with equal distinction, at first in the college of Lisieux, subsequently in that of Beauvais. When he finished his university career, his friends wished him to study for the bar, and he did so far comply with their wishes. Another of his brothers, Joseph, was at the same time a student at the Sorbonne, and afterwards was a professor at the college of Beauvais. He continued to discharge the duties of his appointment till 1761, when, finding them injurious to his health, he resigned, and was appointed private secretary to the Duc de Praslin.

Thomas commenced his career as author in 1756 by publishing 'Reflexions Philosophiques et Littéraires sur le Poème de la Religion Naturelle.' This was throwing down the gauntlet to the whole school of Voltaire; the patriarch himself took no notice of the publication, and Grimm spoke of it as the work of 'a silly lad just escaped from the school of the Jesuits.' In the same year Thomas addressed an ode, full of hyperbolical compliments, to Sechelles, controller-general of finance: the same year, he published another ode addressed by the Academy of Rouen. In 1759 he published 'Journel Composé d'un voyage in a four cantos, on the death of a French officer, killed, as the French alleged, under circumstances of peculiar atrocity, in the war between the French and Spanish Armies; in the translation of this poem, which is also printed in the 'Amné de Littéraire,' a tribute of thanks to the young author who had ventured to attack Voltaire. These early works of Thomas are remarkable only for their tragic style, commonplace ideas, and for the eagerness of the author to avail himself of the popular topic of the day.

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About this time the French Academy, with a view to render the prize-essays of its members more popular, began to propose the éloges of great men as the sub-
jects. Thomas entered the lists three successive years, and was successful every time. His "Éloge de Marmontel," composed in 1765, his "Éloge de Henri François d’Aiguaysseau," in 1766; and his "Éloge de René du Guay-Trouin," in 1767. In 1768 he also
competed for the prize of poetry: his "Épitre au Peuple" was declared next in merit to the poem of Marmontel, to which the medal was assigned. In these composi-
tions a marked improvement can be traced. There is no greater originality of thought than in his first produc-
tions—nothing of genius in them; but more matter, more
of terseness of style, and more comprehensiveness of
thought. The connection with the Duc de Praslin was less advantageous to Thomas than it promised to be at the outset. The duke procured for him the sincere appointment of secretary to represent his Swiss cantons. But a vacancy occurring soon after in the Academy, this minister, who had a personal quarrel with Marmontel, sought to obtain it for his secretary. Thomas had the magnanimity to refuse the appointment, urging the superior claims of Marmontel. This act of honesty lost him the favour of the Duc de Praslin, and closed the career of office which was opening
to him. The admission to the Academy was not however
long deferred. He delivered his inaugural address to
that body on the 22nd of January, 1767. But he already composed—"Éloge de Sully," crowned in 1763; "Éloge de Descartes," crowned in 1765; "Éloge de Louis, Dauphin of France," composed and published at the request of the Comte
d’Artois. His inaugural speech was composed in Octo-
ber, 1766; his opera of "Amphion" was brought out, but t
without success. These works are all characterised by a
progressive improvement in execution. They differ also
from his juvenile productions in an attempt to adopt the
spareness and rhetorical style of the Encyclopédistes
(的脚步) in the complete appropriation of their bold satiric tone in respect to politics, although much of the author’s
juvenile respect for religion remained with him to the last.
A moral consequence of the change, which he had by then
begun to praise Thomas, and Présant had cooled in his
admiration of him: Voltaire had written a complimentary letter on the "Éloge de Descartes," and had on the other hand remarked to his friends that they ought now to substitute the word galthimus for galthibus: Diderot continued implausible. It was rumoured that the court, enraged at the free strain of the "Épitre au Peuple," and the sar-
casm-s launched against itself and the feudal system in the "Éloge du Dauphin," threatened the liberty of Thomas.

The principal publications of Thomas, from the time of his admission into the Academy till his death, are—"Éloge de Marc Aurele," read to the Academy in 1770, and pub-
lished a few years afterwards, as did all his works, at the
inaugural discourse of the archbishop of Toulouse, also
in 1779. "Essai sur le Caractère, les Mœurs, et l’Esprit
des Femmes, dans tous les Siecles," 1772. "Essai sur les
Élégies; ou l’Histoire de la Littérature et de l’Éloquence
applicées à ce genre d’Ouvrage," published in 1774, in an
eDITION of his collected works. He commenced a poem on the
ex-Peter I.; but only four books and part of a fith
were completed at the time of his death. The increased
terminability of his author composed it. He was not
slow itst these works; but the increased boldness of his attempts
also to show the natural meagreness and feebleness of
his genius. He was utterly devoid of impassioned ima-
agination. His "Éloge de Marc Aurele" is an attempt to
personify a Stoic of the age of that emperor: it is like
deficient in interest and dramatic truth. His essay on
the character and manners of women is a collection of pas-
sages which would have swelled his didactic essay on
"Éloges" to too great a bulk. It was said at the time that the
writing was inspired by the suggestions of Rousseau. No
wonder the treatise of Thomas is cold and unimpassioned; it was forced work:
but the ravages of Rousseau are the soleings of a jealous master—inspirations and suggestions of Thomas
"Éloge" is a worthy consumption of the author’s labours in that empty and artificial branch of literature which has all the falsehood of oratory without the interest
which attaches to the eloquence of the bar or senate
from its power of producing great practical effects.

The partially completed poem of "The Czar" is sensible
and the versification smooth, but the four books are four
separate essays in the manner (though not so great
of Thomas’s "Traveller." They never could have been made
parts of an epic.

Thomas died on the 17th of September, 1779. Ra
health, always delicate, had been undermined by tr
cessions in the way of humours, and by the shock he received from an accident which hap-
tened to one friend and the death of another. That he was cap
able of generous feeling and disinterested action he showed
when he forfeited the favour of the Duc de Praslin by
calling him from the Senate, and when he abjured a sinecure
of Marmontel. That he was capable of sincere affection
proved by the footing on which he stood with his family
and friends. The insinuations against his sincerity may
veracity, he was found not by Ducrot set a doubt of his fur
foundation than the change of tone in his later from his
earlier publications. The truth is, that, like many other
ferior literature, Thomas was a mere echo of the society
by which he was surrounded. He took his colouring as
yellow from his preceptors, most of whom were ecclesiastics;
after-life, from the sceptical literary conversation of the
salons of Paris. His eloges are his most characteristic
works, a kind of composition too inaccurate to have any
history, too cold and remote from the real business of
life to interest a critic, and, in return, too disinterested
in the class of writers. The high finish and some of the be
liability of the French school cannot be denied him; there
for this he was indebted quite as much to the company by
as it is from a natural talent, or even his unquestionable

taking.

(Œuvres de M. Thomas, Paris, 1792; Œuvres P.: hu
eres de M. Thomas, Paris, An. x. 1802; Sketch
Thomas," by Saint-Sorin, in the Biographie Universe

THOMAS, Marmontel, of whom the Uganda, extends from 1’s to 25’s N. lat., and from 60’s to 43’s E. long. It is about 140 miles west-north west from Cape Lopez. The island is of an oval shape: it is 17 miles long, 20 miles and, on the contrary, is a number of small mountains, and there are numerous streams of fresh water, with a large, un

ting is abundant. The chief exports are sugar, indigo,
cotton. The island belongs to the Portuguese, and the
habitants, who are chiefly composed of Portuguese
and of negro slaves, amount to about 18,000. A num

of miles. It is of bisallic formation, and mountainous
the Pico de Santa Anna de Chaves is 7000 feet lat The
mountains are mostly covered with wood, and the
other are numerous streams of fresh water, with a large.

THOMAS, ST., Island. [VIRGIN ISLANDS.]

THOMASIN, or TOMBASIN, surmounted Tirke-Sir, the
end of the thirteenth century. He was native of the Italian province Friuli, and died in the year 1186. Being thus an Italian by birth, or, as he
himself says, a Walich, he wrote in his earlier days an
Italian work, probably a didactic poem, "On Cognoe
Manners," which is no longer extant. In the course of a
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poetry, and good conduct consist, and why man should strive after them. It shows that a remarkable progress had taken place in the mind of Thomasian during the interval between the composition of the Italian and that of the German work; and above all, it shows that he had proceeded from the idea that courteous conduct and nobility of birth were always combined with a noble mind, or, in other words, that the changeable rules respecting what are good manners were of greater value than the eternal law of morality which is implanted in every man's heart. This prejudice is altogether given up in his German poem, where he declares that a man is foolish who thinks himself great because he is of noble birth, and that such a notion was regarded as an insult to a man's heart and real character that make him worth anything. Virtue with him is now a fundamental principle, and not a mere expedient. He describes virtues and vices, and their consequences, with a truly Socratic spirit and dignity. Thomasian was well acquainted with the history of antiquity, and it is among the antients that he found his best models of really virtuous men. The whole poem is a sublime and altogether practical system of morality: it is a philosophy in the garb of poetry and occasionally embellished by figurative language. But he does not write in the spirit of any particular school; his object is in general to instruct man on matters concerning his physical and spiritual welfare.

This masterpieces of esteemed, poetry and philosophy has never yet been published entire, but it is said that Frommann is preparing an edition of it. Fragments of it are printed in Eschenburg's Denkmuller Althdeutscher Dichtung, and are gathered together in 'Deutsche der Poetischen National Literatur der Deutschen,' vol. i., p. 456. &c.

THOMASIAN, CHRISTIAN. The real name of this author is Thomas, and in the works which he published in his mother tongue he signed himself Christian, and Thomas. He was born at Leipzig, on the 12th of January, 1655, and was the son of Jacob Thomasius (1622-1684), a distinguished professor of philosophy, and some time rector of the university, interested in a very energetic manner, persuaded the king of Denmark to have all the published parts of Thomasian's works burnt in the market-place of Copenhagen by the hangman, 1689. Such proceedings in a foreign country were treated by Thomasian with contempt; but the storm was gathering over his head. In the same year he became involved in disputes with the Pietists, and also came forward to justify marriages between two persons of different religions, which enraged the divines of Wittenberg to such a degree, that the chief consistency was not satisfied until various proceedings were taken to issue an order for the apprehension of Thomasian. He escaped the danger and fled to Berlin, where he met with a kind reception and the protection of Frederick III., the Elector (afterwards King), who not only permitted him to settle at Halle, but also to lecture in the Ritteracademie (academy for young noblemen) of that place. He began his lectures here in 1690, and met with the same approbation on the part of the students as at Leipzig; and the increase in the number of students induced the elector in 1694 to found the university of Halle, in which he appointed Thomasian professor of jurisprudence, and conferred upon him the title of doctor of laws. In 1695 he was appointed to the faculty of jurisprudence. He died on the 23rd of September, 1728, in the seventy-third year of his age.

If ever a man exercised a beneficial influence upon his age and country, an influence which will extend to the remotest posterity. His virtues and prejudices, his disputes. This enmity was not only provoked by the matter and the manner of his teaching, but also by several publications which tended to destroy established opinions. One of them, on polygamy, especially gave great offence; he asserted that polygamy was at least not contrary to any law of nature.

Up to this time it had been the general custom in all German universities to deliver lectures in Latin, and to preserve the purity of the German language. In the year 1697 Thomasian published his program in German, and announced that he would deliver a course of lectures in German, and on a subject which appeared altogether foreign to a university,—viz. on the foundation in which the German language is based on the example of the French ('Discours, welcher Gestalt man denen Franzosen im gemeinen Leben und Wandel nachahmen soll,' published at Leipzig, 1697, 4to.) This daring innovating was regarded as his colleagues, but although, after the example was once set, it was gradually followed by other professors, until it became the universal practice in all German universities to lecture in German. It was a necessary consequence of this that books of a scientific character now began to be written in German. Notwithstanding both the open and secret attacks to which Thomasian had thus exposed himself, he continued to combat prejudice, pedantry, and error. He was unshaking in his censure, which was usually combined with wit and satire, and even his former teachers did not escape. In the year after, 1698, he established a German Monthly Review, under the title, 'Freimütige, jedoch vernunft.-und gesetzsmässige Gedanken über allerhand, neue und verfehlte Waren, welche zu seiner Zeit in Deutschland getrieben wurden,' which continued to appear till 1708, and which gave him immense influence in all parts of Germany, and the means of chastising his enemies. His enemies in their turn tried every means to keep him in the shadow. Through the school he succeeded in averting the danger that was gathering around him, yet the disputes became daily more vehement and serious, especially with two divines, Pfeifer and Carpzovius, who charged him with atheism. The theological faculty of Leipzig was like a council of war, and H. G. Masius, court preacher to the king of Denmark, who had been rather severely dealt with by Thomasian in his Journal, and who made a reply, to which Thomasian replied with a satire. He also compell'd the king of Denmark to have all the published parts of Thomasian's Journal burnt in the market-place of Copenhagen by the hangman, 1699. Such proceedings in a foreign country were treated by Thomasian with contempt; but the storm was gathering over his head. In the same year he became involved in disputes with the Pietists, and also came forward to justify marriages between two persons of different religions, which enraged the divines of Wittenberg to such a degree, that the chief consistency was not satisfied until various proceedings were taken to issue an order for the apprehension of Thomasian. He escaped the danger and fled to Berlin, where he met with a kind reception and the protection of Frederick III., the Elector (afterwards King), who not only permitted him to settle at Halle, but also to lecture in the Ritteracademie (academy for young noblemen) of that place. He began his lectures here in 1690, and met with the same approbation on the part of the students as at Leipzig; and the increase in the number of students induced the elector in 1694 to found the university of Halle, in which he appointed Thomasian professor of jurisprudence, and conferred upon him the title of doctor of laws. In 1695 he was appointed to the faculty of jurisprudence. He died on the 23rd of September, 1728, in the seventy-third year of his age.
manner that it was evident that the spirit which had been created by the Reformation would soon vanish altogether. All philosophical and scientific works were written in Latin and consequently inaccessible to the reader for the want of a knowledge of that language. No systematic producing new thoughts and ideas, which were frequently crippled and imperfect on that account, or the language itself was barbarous. In the universities also Latin was the ordinary language for communication, which was the exclusive possession of a small number, and without influence upon the nation at large. Thomasius prepared the way for better things, first by communicating knowledge in his native language, and by extending the use of which he spread the knowledge and did diffuse peace. All this would alone be sufficient to immortalize his name, even if he had no claim to it by what he did in philosophy. Here he indeed found things in such a state, that the human energy to wrestle with the weeds with which it was overgrown, before it was fit to receive the seed, and accordingly his philosophy is more of a destructive than of a constructive character. But in this negative way he has done incalculable service to his nation, and Frederick the Great truly says, that among all the philosophers of Germany, none have contributed more to render its name illustrious than Leibnitz and Thomasius.

The number of works of Thomasius is considerable. Besides his own there appeared above 900, and he was noticed: ‘Einleitung zu der Vernunftlehre, worinnen durch eine leichte, und allen vernünftigen Menschen, wasserle Standes oder Geschlechts sie seyn, verständliche Manier, der Weg gezeigt wird, ohne die Sylogistica, das Wahre, Wahrscheinliche und Falsche von einander zu entscheiden und neue Wahrheiten zu erfinden.’ Halle, 1691, 8vo. The fifth and last edition of this work appeared at Halle, 1715, 8vo.; it was the first readable book that had ever been produced in Germany on logic. ‘Von der Kunst vernünftig und tugendhaft zu lieben, als dem einzigem Mittel zu einem glückseligen, galanten, und vergrünten Leben zu gelangen, oder Einleitung der Sittenlehre,’ 4to, Halle, 1692, 8vo.; an eighth edition of it appeared in 1709. His work contains a system of ethics better than any that had appeared before him. ‘Historie der Weisheit und Thoorheit,’ in three parts, Halle, 1693, 8vo. ‘Weitere Erläuterung durch verschiedene Exempel, andern Menschen Gemütigen kennen zu lernen,’ Halle, 1693, 8vo., reprinted in 1711. ‘Der Kern wahrer und nützlicher Weisheit,’ Halle, 1693, 8vo.: this is a translation of Xenophon’s ‘Memorabilia of Socrates,’ which Thomasius strangely enough took from the French translation of Chardin; although he himself was well acquainted with the Greek. ‘Vorsuch vom Wesen des Geistes, oder Grundlehren die einem Studijs Juris zu wissen und auf Universitäten zu lernen nöthig sind,’ Halle, 1698, 8vo., reprinted in 1709. Concerning aber doch muttere und vernünftige Gedanken und Erkenntniss über allher hand ausserordentliche juristische Händel,’ 4 vols., Halle, 1720-21. His miscellaneous and smaller essays appeared in a collection under the title: ‘Kleine Deutsche Schrifften mit Fleiss manegutragen,’ Halle, 1710, 8vo. A complete list of his works is given in Ludens’s Christian Thomasius nach seinen Schicksalen und Schriften dargestellt, with a preface by Johannes von Müller, Berlin, 1859, 8vo.; and in Jüdren’s Lexicon Deutscher Dichter und Schriftsteller, p. 425-26.

THOMAS, S. [THOMASUS, SIB.]

THOMAS, JACOB. [THOMASUS, CHRISTIAN.]

THOMASTON. [MAINE, p. 307.]

THOMAS, THOMAS, an architect who practised at St. Petersburg, and held the rank of a major in the Russian service, a native of France, December 21, 1759. Scarcely had he completed his professional education at Paris, when the Revolution rendered it unsafe for him, and his family being royalists, he was induced to emigrate to Russia, where he at first supported himself by the productions of his pencil, which not only found purchasers, but made him favourably known to the St. Petersburg public. The taste for an enterprise of philosophical and metaphysical knowledge being employed by the government in that branch of art which he had originally intended to follow, and one of the first works of any importance intrusted to him was the Great Theatre (erected by the German architect Tschichold, 1717-21) for the Drama, which is also still in use and partly remodelled, in 1804. Although not altogether free from the peculiarities of the French school, the façade and octagonal Ionic portico which he added to it distinctly mark it as a house of amusement, and dates from the capital of Russia, and, of its kind and date, in Europe. Had he executed nothing else, that alone would have entitled him to rank higher in his profession as an artist than many who owe their celebrity as much to the number as to the merit of their works. But he had also the opportunity of displaying his taste and ability in another very striking public edifice at St. Petersburg, namely, the Imperial Bizona, or Exchange, erected by him between the years 1784 and 1810, which is an insulated structure composed of 300 Ionic columns, reprinted, and decays at each end (although without pediments) and having altogether 44 columns. Situated at the southern point of the Vasiliyevsk Island, immediately facing the Neva, it is, in a sense, a “place, upon a rich architectural terrace, which sweeps out so as to form a semicircular esplanade in front, at each extremity of which is a flight of steps leading down to the river, and a massive rostral column 120 feet high. Taken altogether, the architectural combination thus produced is exceedingly picturesque, and may be said to be unique.

Thomond also erected some private mansions and other buildings at St. Petersburg, the mausoleum of the empress Elizabeth, and at Odessa, a spacious convent, and a monument. In 1808 he published some of his buildings and architectural designs in a quarto volume, very unsatisfactorily executed however; and he also wrote a treatise on painting, an art which he was greatly attached. He died August 22, 1813.

(Kokulnik, in Khudozhestvennya Gazeta, 1837.)

THOMSON, SIR B. [RUMFORD, COUNT.]

THOMSON, JAMES, was born at Ednam in Roxburghshire on the 11th September, 1700. His father was clergyman of the place, and distinguished for his ecclesiastical character. James was first sent to the grammar-school at Jedburgh, and completed his education at the University of Edinburgh, where in 1719 he was admitted to the degree of a B.A.; and in 1721, to that of a B.C.L.; and a few years after, Dr. Murdoch, affected him to an uncommon degree, and his relations still remember some extraordinary instances of his grief and filial duty on that occasion.

Thomson turned from divinity to poetry owing to the following incident:—The Rev. Mr. Hamilton, filled the chair of divinity, gave as a subject for an exercise a psalm in which the majesty and power of God are described. Of this psalm Thomson gave a paraphrase and illustration as the exercise required, but in so poetical and figurative a style as to astonish the audience. Mr. Hamilton complimented the performance and pointed out to the students its most striking points; but, turning to Thomson, he suggested that if he intended to become a minister he must keep a stricter rule. He was a man of great benevolence and learning and he was a man of great benevolence and learning and was a man of great benevolence and learning, and was a man of great benevolence and learning, and was a man of great benevolence and learning, and was a man of great benevolence and learning, and was a man of great benevolence and learning.

Some encouragement held out to him by Lady Gwri. Baillie following this intimacy of the Professor, he determined to give up divinity and try his fortune in London. Slender as this pretext of encouragement was, there had been many poets who have thus sought their fortune from no stronger reason. The truth is, Thomson wanted to try his capacity in London, and seized on this as a pretext. ‘One evening,’ says Dr. Johnson, ‘I was loitering about’ with the gaping curiosity of a new-comer, his attention upon everything rather than upon his pocket, when his handkerchief, containing his letters of recommendation to several persons of consequence, was stolen from him. And now the lonely poet in the vast city fast
felt his inexperience and his poverty. A pair of shoes was his first want; his manuscript of 'Winter' his only property. A purchaser for this poem was found with little difficulty; but Mr. Millar consented to give a trifle for it, and it was paid for in 1726. But even till Mr. Whately and Mr. Speke spoke so favourably of that it was accepted, and it was rapidly popularized, and one edition very speedily followed another.

This success procured him many friends, among whom was Dr. Rundle, who introduced him to the lord chancellor Talbot; and some years after, when the eldest son of that nobleman made a tour on the continent, Thomson was appointed as indent, to be indispensable to the poetical powers were fully employed, and in 1727 appeared his 'Summer;' in 1728, his 'Spring;' and in 1730, his 'Autumn.' Besides these he published, in 1727, 'A Poem to the Memory of Sir Isaac Newton,' and 'Britania,' a poetical invective against the ministry for the indifference they showed to the depredations of the Spaniards in America. By this piece he declared himself a favourer of the court, and therefore could expect nothing from the court.

The tragedy of 'Sophonisba' was acted in 1727, Wilks taking the part of Maasinissa, and Mrs. Oolfheel that of Sophonisba. So high were the expectations raised, that the poetic power was magnified with a splendid audience, and collectors to anticipate the triumph of the poet-publishing for the public. Its success however was very equivocal.

'There is,' says Johnson, 'a feeble line in the play:—

O Sophonisba, Sophonisba, O!'

This gave occasion to a waggish parody,

'O, Jenny Thomson, Jenny Thomson, O!
which for awhile was echoed through the town.'

At this time long opposition to Sir Robert Walpole had fixed the nation with classics and liberty, and Thomson, instinctively seizing the poet's office to utter in verse the wants of the nation, determined on writing a poem on Liberty.' He spent two years on this undertaking, and wrote it as 'if he was ditching. A difficult task, which had left him the most trouble. It was divided into five parts, which were published separately, thus: 'Antient and Modern Italy compared; being the first part of "Liberty," a poem,' 1735. 'Greece; being the second part, &c.,' 1736. 'Rome; being the third part, &c.,' 1736. 'Brittain; being the fourth part, &c.,' 1736. 'The Prophet; being the fifth part, &c.,' 1736. The poem of 'Liberty' does not now appear in its original state, having been shortened by Sir George (afterwards Lord) Lyttelton. Of all Thomson's works this was the most popular, being independent of the feebleness of its execution, it is obvious, as Johnson remarked, that the recurrence of the same images must tire in time; an enumeration of examples to prove a position which nobody denied must quickly grow disgusting.

His friend Talbot appointed him secretary of the privy council, requiring little attendance, suit his retired ironday way of life, and equal to all his wants. When his patron died, Lord Hardwicke succeeded him, and kept the office vacant for some time, probably till Thomson should apply for it; but either his modesty, pride, or depression of spirits prevented his asking, and the new chancellor could not give him what he would not request. This reverse of fortune increased his literary activity. In 1728, besides editing his own works in two volumes and writing a preface to Milton's 'Areopagitica,' he produced the tragedy of 'Agamennon,' with Quin for his hero. For this he got 'no considerable sum,' though it had but poor success. Johnson says that on the first night Thomson seated himself in the upper gallery, and was so interested in its performance, that he accompanied the players by audible recitation, till a friendly hint frightened him to silence.

Thomson's next tragedy was 'Edward and Eleonora,' which was not allowed to be represented on account of certain pretended allusions. He then wrote, conjointly with Dr. Johnson, 'The History of Sir Roderick Random,' before the prince and princess of Wales at Chislen in 1740. This masque contains the national song of 'Rule Britannia,' which Mr. Bolton Conyns ascribes, 'on no slight evidence,' to Mallet.

Thomson's next work was another tragedy, 'Tancred and Sigismunda,' which, being taken from the interesting story in 'Gil Blas,' instead of the Grecian mythology, as were his other pieces, had more success. Garrick and Mrs. Catterall played the to great advantage. Lord Lyttelton now appointed him surveyor-general of the Lee-ward Islands, from which, after paying a deputy, he received about 300l. a year.

The 'Castle of Indolence,' which was many years under his hands, was now finished and published (1748). It was at this time more than a few detached stanzas, in the way of a relief on himself, and on some of his friends who reproached him with indolence, while he thought them at least as indolent as himself. But this subject grew under his hands till it became his masterpiece.

A violent cold, which from inclemency became worse, at last carried him off, on the 27th August, 1748. He left behind him 'The Tragedy of Coriolanus,' which was brought on the stage by Sir George Lyttelton for the benefit of his family. A considerable sum was gained, which paid his debts and relieved his sisters. The remains of the poet are deposited in Richmond churchyard.

Thomson was 'more fat than hard beseams,' of a simple, unaffected, indolent, sensual character; silent in company, but cheerful among friends, of whom he had many and true. This character is discernible in his writings. The simplicity is seen in the purity and warmth of his sentiments, sometimes difficult to the man of fashion for the public. Its success however was very equivocal.

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THORAX. [Respiration.]

THORDON. [Chalais.]

THORACIC DUCT is the principal trunk of the lymphatic or absorbent system, and the canal through which the great chyle and lymph is conveyed into the blood. It commences, below, at what is called the receptaculum chyli, which receives all the principal absorbent vessels from the intestines and from the lower extremities, and lies at the posterior and middle part of the abdomen, on the upper lumbar vertebra and on the right side of the aorta. In man the diameter of the receptaculum is but little greater than that of the thoracic duct, which is continued from it; in most other animals it is considerably greater, and the duct seems in them to commence in a large pouch. From the receptaculum chyli the thoracic duct passes upwards, on the right side of the aorta, and behind it, from the abdomen into the chest, being joined along the course by the subcostal and chylous veins of the adjacent organs. Opposite the sixth dorsal vertebra it begins to bend to the left, and, after passing behind the arch of the aorta, it ascends to the level of the seventh cervical vertebra, curves forwards and downwards, and enters the left jugular vein, usually near its junction with the left jugular vein. At this orifice of the thoracic duct there are two valves, like those of the veins, which open to permit fluid to pass from the duct, but close when any is forced against them from the vein. Other valves in uncertain number are found in different parts of the duct, and have all the same direction as those of veins.

[Accompaniments; Chyle; Digestion.]

THORNSBY, RALPH (born 1658, died 1725), a virtuous
and antiquary, and an early Fellow of the Royal Society, was the son of a merchant at Leeds, and born in the same town. He had his early education in the Leeds grammar-school, but, being intended by his father for commerce, he did not pursue any of the higher studies. He had however what may be called a liberal commercial education, being sent by his father to Holland for the purpose of becoming acquainted with the mode of conducting business in that country, and of acquiring the modern language and manners. He settled in his native town, where his family was connected with some of the principal persons who formed the society of Leeds, and where he had a business prepared for him, but he was afterwards sent by his father to France, where he possessed himself of the French language and manners. The society of the learned at Paris was a means of bringing him acquainted with all the celebrated antiquaries and naturalists of the time, and his eagerness respecting the things and persons among them which presented any features of historical interest, a desire of collecting objects of curiosity, natural or artificial. His father had something of the same taste; he purchased the collection of coins and medals which had been formed by the family of Lord Fairfax, the parliamentary general, and this collection was the nucleus of the museum formed by Thoresby. He was a man of an easy and open disposition, and was very fond of experiment, making many communications, esteemed of value, to private friends or to the Royal Society.

With this turn of mind, it will hardly be supposed he was not very successful in his mercantile affairs. He however the good sense to withdraw from business when his fortune was entirely lost to him, and about the sixth year of his age he seems to have wholly retired from it, and to have formed the determination of living a little more retired and exempted from the cares and toils of business, a portion of his property that remained would afford him.

Besides amassing such manuscript matter as he could, and many means become possessed of, he was himself a judicious classifier, and was also accustomed to consume his growing collection of manuscripts, and little time of it could be collected from his friends or the old people of the town. When released from the cares of business, he had leisure to make use of these notes, and he entered upon the preparation for the press of two works, which it was estimated he should contain all that he had gathered in what he had been from the first his favourite subject, the history of his native town. One of them was to be in the form of a topographical survey of the whole of the large and a few of the smaller parishes which are supposed to have been comprehended under the very ancient local title of 'Elmète,' the other, a history of the various transactions of which that district had been the scene, of its more eminent inhabitants, of the public transactions of government, and of all changes which had taken place in the state or fortune of its inhabitants. The first of these designs only was accomplished. The work appeared in a folio volume, which bore the title of 'History of the topography of the Town and Parish of Leeds.' This work leaves little for the inhabitants of the town to desire of a kind, except that he had prepared the historical part of it as he had; but it has been perpetually referring the reader to a work of more title to fame. The work is more than its title, as the result of a large body of genealogical information, comprehending descents of nearly all the families of consequence who inhabited the central parts of the West Riding. There is
THORN is the principal literary work for which we are indebted to him. As a kind of supplement to it, he published, in 1724, a history of the Church of Leeds, under the title 'Vicaria Leodiensis,' which, like his former work, was more than it was strictly intended for his subject, but in themselves valuable. A new edition of the 'Thorn,' containing also all the matter of the 'Vicaria' which properly belonged to Leeds, was published by Thomas Dunker Whittaker, LL.D., in 1816.

The writings of the Bishop, bishop Gibbon, Obadiah Walker, Calamy, Strype, Hearne, and many other persons, show how willing Thoresby was to give assistance to any of his literary friends in their various publications. Thoresby kept during the greater part of his life an exact delineation of his personal appearances. When his portrait was taken, the portions which remain of it were published in two octavo volumes in 1830, and two more volumes were published at the same time of selections from the letters of his various friends; these were published under the care of Mr. Hunter. They exhibit the peculiar features of a somewhat remarkable character, and the particular incidents of his life. A large account of him may be found in the 'Biographia Britannica,' and another prefixed to Dr. Whittaker's edition of the other site of the 'Vicaria.'

THORITE, a mineral in which thorium was discovered to exist by Berzelius. It occurs massive and compact. Fracture uneven, very brittle, and full of cracks. Hardness 3 to 3.5. Color white, grey, yellow, red, and sometimes black. Spec. gravity 4.63 to 4.80.

Before the blow-pipe, gives off water, and becomes yellow, but does not fuse.

It is found in syenite, in Norway. It contains nearly 58 per cent. of thorium, mixed with metallic and other bodies.

THORIUM, or THORITUM, a metallic body discovered by Berzelius in an earth to which he had given the name of thorium. Thorium, like its associated mineral, after washing the mass a heavy metallic powder was left of a deep leaden-grey colour, which, when pressed in an agate mortar, acquired an iron-grey tint and a metallic lustre. It is not oxidized by water, either hot or cold, but when heated in the air it burns brilliantly, and is converted into oxide of thorium, or thorin, which is perfectly white, and devoid of any trace of fusion. Thorium is scarcely at all acted upon by nitric acid, and slowly by the sulphuric; and it is readily dissolved in cold solutions of hydrochloric acid. Thorium oxidizes readily with the evolution of hydrogen gas.

Oxygen and Thorium combine to form oxide of thorium, or thorin, by heating the metal in the air, or by decomposing it with cold water. The oxide has the same appearance, but its properties are different. When it has been strongly heated, its density is 9.402, and it is insoluble in any acid but the sulphuric, and in that with difficulty. It is precipitated in the state of hydrate from its solutions by the alkalies, and in this state it is readily soluble in acids, and is converted into carbonate by exposure to the air. The alkaline carbonates dissolve the hydrate, carbonate, and subslabs of thorin; thorin is precipitated from solution by the ferrocyanide of potassium.

Thorin probably consists of—

One equivalent of oxygen

8

One equivalent of thorium

60

Equivalent

68

Besides combining readily with oxygen, as already mentioned, thorium unites energetically with chlorine, sulphur, and phosphorus; but the compounds which they form have not been minutely examined.

THORN. [CRATAEGUS.]

THORN-APPLE. [Datura.]

THORIN (in Polish, Toruń) is a celebrated fortress in the government of Pomerania, in the province of Prussia. It is situated in 53° N. lat. and 26° 25' E. long., on the right bank of the Lower Oder, which is the remains of a standing bridge over the Vistula in its whole course. (The others are floating bridges.) It consists of two parts, the German and the Polish bridge, which are separated by an island called the Mazarkampe. The German part, from the town to the island, is 1400 feet long, the Polish part is 927 feet long. The whole distance from Thorn to the opposite bank of the Vistula (including 296 feet for the island) is 2469 feet: the breadth of the whole way is 18 feet; it is 17 feet above the river at its ordinary level.

Thorn is divided into the old and the new town. There are two Lutheran and three Roman Catholic churches, two hospitals, one of Benedictines, and a Lutheran gymnasium, a Roman Catholic school (formerly a Jesuits' college), four elementary schools, one girl's school, four hospitals, an infirmary, and a house of correction. The most considerable buildings are the cathedral, built in the Gothic style, in St. John's church, containing the monument of Copernicus, who was born here in 1473, the town-house, built in 1602, on the model of that at Amsterdam (the doors, inlaid with ebony and ivory, the marble table, and the paintings on the walls are memorials of the rich and learned kingdom, like that at Pisa; and the house in which Copernicus was born.

Thorn is indebted for its foundation to Hermann Balk, master of the Teutonic order, who immediately on his arrival, in 1231, fortified the antient castle of Turno, at Old Thorn, about five miles from the present town. In the following year he founded the town, but, finding the situation inconvenient, pulled it down in 1225, and chose another site eight miles from the Vistula. At the commencement of the fourteenth century Thorn joined the Hanseatic League, and during the dominion of the Order became rich and flourishing through its extensive commerce. It was allied to the towns of the Polish 'New Kingdom,' and with it threw off the authority of the Knights: it took an active part in the sanguinary war arising from this step, which ended with the peace concluded in its walls in 1466, by which West Prussia was annexed to Poland. Commerce continued to flourish under the Polish government, but the city suffered severely, partly from the internal troubles of the kingdom, partly by the wars with Sweden, during which it was twice plundered by the Swedes (1655, 1703). Charles XII entirely destroyed the fortifications. The Reformation was favourably received at an early period, but led to very harassing measures on the part of the Roman Catholics, and to internal troubles. These dissensions continued from the time of Sigismund I. (1506-1548), through the sixteenth and seventeenth centuries; and at the beginning of the eighteenth century occasioned what is called the 'Thorn Tragedy,' a persecution excited by the Jesuits, which ended, on the 7th December, 1724, with the execution of the burgomaster John Rosner and eleven of the principal citizens.

When West Prussia was separated from Poland in 1772, Thorn and Danzig remained under the Polish government; but the declining industry of the country, together with many obstructions to its commerce caused by the regulations of Prussia for the navigation of the Vistula. After its union with Prussia, in the second partition of Poland, in 1793, its commerce and prosperity revived. Since 1810 it has been again converted into a fortress. It is also important as a commercial port for the exportation of the produce of the country, corn, timber, linen, raw hides; especially however hemp. The population, including the garrison, is early 7000 inhabitants.

(A. E. Preuss, Beschreibung von Preussen; Brockhaus, Conversations Lexicon, 7th edit.; Hassel; Cannabich; Hirschelmann.)

THORBURY. [GLOUCESTERSHIRE.]

THORNE. [YORKSHIRE.]

THORNEY. [CAMBRIDGESHIRE.]

THORNILL, SIR JAMES, an eminent painter during the reigns of Queen Anne and George I., and, says Walpole, 'a man of much note in his time.' He was born at Verrio, and was the rival of Laguerre in the decorations of our palaces and public buildings,' was descended of a very antient family in Dorsetshire, and was born at Weymouth in 1676. Through the extravagance of his father, who descended in consequence of this marriage to support himself by his own exertions. He adopted the profession of a painter, and, by the liberality of an uncle, Dr. Sydenham, the eminent physician, he was enabled to pursue his studies in London, where he lived himself, and to whom however he did not remain long. Thornhill appears to
have made rapid progress in the public favour, for in his fortieth year, when he made a tour through Flanders, Holland, and France, he was sufficiently wealthy to purchase many valuable pictures of the old masters and others. Upon his return to England, he purchased the celebrated Queen Anne to paint the interior of the cupola of St. Paul's cathedral, in which he executed eight pictures illustrating the history of St. Paul, painted in chiaroscuro, with the lights and shades, for which he was appointed the first historical painter to the queen, yet was paid only forty shillings the square yard for his production. Thornhill's reputation was now established, and, through the favour of the earl of Halifax, he received the commission to paint the ceiling of the great hall at Hambledon, in Hampshire, where the lord chamberlain, the Duke of Shrewsbury, had intended should be painted by Sebastiano Ricci, then in great favour with the court in England; but the Earl of Halifax, who was then first commissioner of the treasury, declared that if Ricci painted it he would not pay him. Sir James executed many other great works, as the staircase, the gallery, and several ceilings in the palace at Kensington, at a hall at Blenheim, the chapel at Lord Oxford's at Wimpole in Cambridgeshire, a saloon for Mr. Styles at Moor Park in Hertfordshire, and the ceilings of the great hall at Greenwich Hospital. Sir James commenced the last work in 1703, and was occupied upon it for several subsequent years; but it was not entirely painted by his own hands. The paintings are allegorical: on the ceiling of the lower hall, which is 112 feet by 56, are represented the founders of the institution, William III, and Queen Mary, in the centre, surrounded by the attributes of nature, and the seven Liberal Arts; on the other ceilings are figures which represent the zodiac, the four seasons, and the four elements, with naval trophies and emblems of science, among which are introduced the portraits of famous mathematicians who have advanced the science of navigation, as Tycho Brabant, Copernicus, Newton, and others. On the ceiling of the upper hall are represented Queen Anne and her husband Prince George of Denmark; other figures represent the four quarters of the world; on the sides, the heads of the principal persons of the landing of William III. at Torbay, and the arrival of George I. at Greenwich; on the end wall facing the entrance are portrait groups of George I. and two generations of his family, with accessories, and Sir James Thornhill's own portrait. These works, which are executed in oil, have little to recommend them besides their vastness; yet in invention and arrangement they are equal to the majority of such works in the great buildings on the continent: in design and color they are inferior.

Walpole has preserved some interesting details respecting the remuneration Thornhill received for some of his works: he says, 'High as his reputation was, and laborious as his works, he was far from being generously rewarded for them; and for others he was compelled to obtain the stipulated prices. His demands were contested at Greenwich; and though La Fosse received 2000L. for his work at Montague House, and was allowed 500L. for his diet besides, Sir James could obtain but forty shillings the square yard for the cupola of St. Paul's, and I think no more for Greenwich. When the affairs of the South Sea Company were made up, Thornhill, who had painted their staircase and a little hall, by order of Mr. Knight, their cashier, for 500L., but on his showing them that he had been paid but twenty-five shillings the yard for the hall at Blenheim, they would allow no more. He had a longer contest with Mr. Styles, who had agreed to give him 3500L., but, not being satisfied with the execution, a lawsuit was commenced, and Dahi, Richardson, and others were appointed to inspect the work. They appeared in court bearing testimony to the merit of the performance; Mr. Styles was condemned to pay the money, and, by the order of the court, 500L. more, for stipulations about the house, and for Thornhill's acting as surveyor of the building.' Thornhill obtained permission, through the earl of Halifax, to copy the Cartoons of Raphael at Hampton Court, upon which he bestowed three years' labour; he made a set of one-hundred and thirty cartoons, and exhibited them in a vast room, and at the Royal Academy. In 1709, the east window of the不幸的几个人花费巨大的代价建造了这样的大房子。他们被出售给多佛伯爵，然后在多佛伯爵的布卢姆伯里广场被展示出来，由几位女画家购买。接着，它们被送给了皇家学院。”

Thornhill painted also several portraits and some easel pieces; he painted the altar-piece of the chapel of St. Souls at Oxford; and one which he presented to the Duke of St. Albans, now on the Register at Oxford, according to Dallaway, a good portrait of Sir Christopher Wren by Thornhill; and in the hall of Green- wich Hospital there is by him the portrait of John Wesley, in his ninety-eighth year, one of the first admitted into the hospital: it is painted in a bold carto- nesque style, and was presented to the hospital by Thornhill himself. In 1724 he opened an academy for drawing at his house in Covent Garden. He had previously proposed to the earl of Halifax the foundation of a Royal Academy of the Arts, with apartments for professors, but without result. Sir James estimated the cost at 3138L.; for, amongst his other occupations, he occasionally 'dabbled' in architecture. At the beginning of 1724 he returned to England, and, in the spring of 1734 he retired to his paternal seat at Thornhill, near Weymouth, which he had the satisfaction of repurchasing; but his period of repose was extremely short, for, says Walpole, 'four days after his return he was seized with a fever, and died in seven, leaving one son named James, whom he had pre- cured to be appointed serjeant-painter and painter to the navy; and one daughter, married to that original and exquisite genius, Sir James Thornhill amassed considerable property, was a man of agreeable manners, was a Fellow of the Royal Society, and represented his native town, Weymouth, in parliament for several years until his death. He was buried in Westminster Abbey; his widow, Lady Thornhill, got a monument at Cheapside in 1757. (D'Argenville, Abrégé de la Vie des plus fameux Peintres; Walpole, Anecdotes de Painting in England, P. Kingstone, Dictionary of Painters.)

THORNTON, BONNELL, was born in London, in the year 1724. He was educated at Westminster School, and at Christchurch, Oxford. In compliance with the wish of his father, who was a physician, he studied medicine, but he had a genius for the arts, and as he liked the re- spective. George Colman the Elder was his fellow-student at Westminster School and at Christchurch, though about nine years younger than Thornton. Similarity of taste led to friendship, and they commenced in conjunction the series of 'The Shipwreck'; and 'The Shipwreck' was continued from January 31, 1734, till September X. 1756. The papers are chiefly of a humorous character and the wit and shrewd observation of life which they display well entitle them to the place which they retain among the works of British essays. Thornton contributed largely to 'The St. James's Magazine, 'The Public Advertiser,' 'The Covent-Garden Journal' and other periodical works. He published separately an 'Almanac for Boston,' an elogium, a 'Canto to Dr. Garth's Poem of The Dispensar,' and 'Londen, which appears to have incurred his censure by habitual indulgence in drinking, died May 3, 1758, 4to.'
THOROUGH-BASE, the art of playing (on keyed instruments, and according to the rules of harmony) an accompaniment from figures representing chords, such figures being placed either over or under the notes of the instrumental base staff. This is one of the many absurd terms employed in music, and its meaning is altogether arbitrary.

The figures used in THOROUGH-BASE are the nine units. These represent certain intervals or sounds. Thus a 6 placed under a 3 means 6-3, an interval of 3rd.

Some other chords of an extraordinary kind are occasionally formed; but they are always clearly denoted, in THOROUGH-BASE, by a ample number of figures.

The above chords exemplified.

When two figures are placed in succession over one base note, the time of the latter is divided between them. Example:

```
\[ \begin{array}{cccc}
| & | & | & |
\end{array} \]
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A sharp, or flat, or natural, placed alone over a base note, relates solely to the 3rd. Example:

```
\[ \begin{array}{cccc}
| | & | & |
\end{array} \]
```

When other intervals are to be raised or lowered, the proper characters for the purpose are prefixed to them. A dash through a figure is equivalent to a sharp.

The practice of figuring a base staff, another in a score or in the part assigned to a keyed instrument, has fallen into disuse, the harmony being now fully and clearly presented to the eye of the accompanist in notes placed in a treble staff over the base.

The knowledge of what is yet too commonly misnamed THOROUGH-BASE, that is to say, harmony, is absolutely indispensable to the good musician, and very much abbreviates the labour of those who, as amateurs, only aspire to a practical skill either as vocal or instrumental performers. The rules of harmony stand in the same relation to music as those of grammar do to language.

The invention of a Figured Base (Basso Cifrado, as the Italians so well denominate it) was stated to have taken place in 1605, and is commonly attributed to Ludovico Viadana, Maestro di Cappella at the cathedral of Mantua. But this kind of musical abbreviation was earlier practised, and by an English composer, Richard Deering, who, in 1597, published his Cantiones Sacrae, at Antwerp, in which a figured base appears. And we have now before us Jacopo Peri's serious opera Euridice, printed at Florence in 1600, in which the base is figured throughout. Lying by us also is Caccini's Nuove Musiche, likewise printed at Florence, but one year later, and here we find the base regularly figured. The edition of the latter work referred to by Dr. Burney, is dated Venice, 1615; it is to be presumed therefore that the active historian of music was not so fortunate as to have met with the first edition of Caccini's remarkably curious and now very rare work.

THOU, JACQUES-AUGUSTE DE (or, as he called himself in Latin, Jacobus Augustus Thuanus), was born at Paris, on the 9th of October, 1593; he was the third son of Christophe de Thou, first president of the parliament of Paris, and of his wife Jacqueline Tuellen de Celi. Besides their three sons and four daughters, who grew to be men and women, De Thou's parents lost six children in infancy; and he himself was so weak and sickly a child till he reached his fifth year, that he was not expected to live. In the exemption which this state of health procured him in his childhood and early boyhood from severer taskwork, he amused himself in cultivating a turn for drawing, which was hereditary in his family; and in this way, he tells us himself, he learned to write before he had learned to read. Although originally intended for the church, he went in his early studies the whole round of literature and science as was taught; and while yet only in his eighteenth year he had conceived from the perusal of some of his writings so great an admiration of the celebrated jurist Cajetan, that he proceeded to Valencia in Dauphine, and attended his lectures on Papism. Here he met with Joseph Scaliger, with whom he contracted an intimate friendship, which was kept up for the thirty-eight remaining years that Scaliger lived. In 1572, after he had been a year at Valence, he was recalled home by his father; and he arrived in Paris in time to be present at the marriage of Henry, the young king of Navarre, and to witness the horrors of the massacre of St. Bartholomew which

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followed. He relates that he saw the dead body of Coligny hanging from the gibbet on Montmartre. The next year he embraced an opportunity of visiting Italy, in the suite of Paul de Foix, who was sent by Charles IX. on a mission to the Italian States. He remained in that country till the death of Charles, in May, 1574, and the accession of Henry III., the news of which reached them at Rome, called De Foix home. In 1576 he made a journey to Germany and the Netherlands, and returned to France in 1578. He succeeded Jean of la Grange, Sire de Saigne, as one of the ecclesiastical councillors of the parlement of Paris—an entrance into public life which, he says, he made with reluctance, as withdrawing him in part from the society of his books and from the contemplation of literature. But he would have been much better pleased to spend his days. The next year he lost his eldest brother; and from this time it began to be proposed that, for the better chance of continuing the family, his original destination should be changed, that he should quit his ecclesiastical for a civil career. Some years elapsed however before this scheme was finally determined upon. Meanwhile he continued to pursue his usual studies; and he states that he had already conceived the project of his great historical work, and begun industriously to collect materials for it wherever he went.

It was in the year 1582, while on a visit to Bordeaux, that he made the acquaintance of Montaigne, whose character he has retained for the same year his father died; and having also by this time lost his second brother, he, in 1584, resigned his rank as an ecclesiastical counsellor, and on the 10th of April was appointed to the office of reversionary of reversion of reversion, which then was wont to be held indifferently by ecclesiastics or laymen. Two years after he obtained the reversion of the place held by his uncle, of one of the presidents au mortier in the parlement de Paris; and in 1587 he married Marie, daughter of Francois Barillon, Sire de Cani. When, in the next year, in the increasing distractions of the state, Henry III. found himself obliged to leave Paris, De Tho, who, as well as his father and his brothers, adhered closely throughout the troubles of the court to his party, accommodated his majesty to Normandy, and afterwards to Picardy. At Chartrres, in August, 1588, he was admitted a counsellor of state; and from this date he took a leading part in all the principal public transactions which followed. When the estates of the kingdom were assembled at Blois, in October of this year, De Tho, as he tells, was there courted with much blandishment by the duke of Guise, but steadfastly resisted the attempt to seduce him from his loyalty. He had left Blois soon after the death of the noyé, the young king of Navarre and his brother the cardinal (on the 23rd and 24th of December) reached the capital; and he had great difficulty in effecting his escape from the popular fury which, however, in part following him to Blois; and having soon after been dispatched on a mission into Germany and Italy to raise succours of men and money for the royal cause, he was at Venice when he heard of the death of Henry. In August, 1588. He immediately set out by the way of Switzerland for France, and met the king of Navarre, now calling himself Henry IV., at Chateauguillon. He was received very graciously; and for some years from this time he was constantly with him, and employed on missions to different quarters in his service.

In 1581, while Henry was at Nantes, he received accounts of the death of Amyot, bishop of Auxerre (renowned for his translations of Plutarch and other Greek authors); upon which his majesty immediately bestowed his office of keeper of the royal library on De Tho. It was in the year 1593, as he has noted, that he at last actually commenced the composition of his History, which he now states he had conceived in his mind twenty years before. In 1594 the death of his uncle opened to him his reversionary office of one of the presidents of the parlement de Paris.

Among other important transactions in which he had a part after this, was that of the Edict of Nantes, published in 1598, which he was greatly instrumental in arranging. He has left an account of his own life, in ample detail, down to the year 1601, in which the last event he notices is the death of his wife, in August of that year. In 1614 he published the first eighteen books of his History. The work was received with general applause by the public throughout Europe, and, although some things there gave umbrage to the more zealous friends of the Catholic faith, it was not till several years after the Edict of Nantes, in 1610, did not deprive De Tho of his place in the ministry; but he had no longer the same influence as before; and a new appointment, which he received the following year, of one of the three directors charged with the management of such papers as were to be kept in the ministry, was successfully carried on. But the country was at that time suffering from long and unceasing civil war. In 1614, the great Sully, was fell by himself to be not so much an accession of power or honour, as a burdensome and obnoxious office forced upon him, for which he was fitted neither by taste, habits, nor qualifications. In the year 1615, on the death of his brother-in-law, Achille de Harlay, resigned his office of first president of the parlement de Paris, in the hope that De Tho would be nominated his successor; but the place was given to another. These disappointments and disgusts, together with the loss of a second wife, are supposed to have shortened the life of De Tho, who died at Paris on the 7th of May, 1617, in his sixty-fourth year. By his second wife, whose family name was de Bourdelles, he left three sons and three daughters, one of the former of which was born in 1588, the year of the de Tho's birth. In 1584, the eldest son of his fathers virtues and of a considerable share of his talent, felt a sacrifice to the inexorable revenge of Cardinal Richelieu, one of whose last acts was this putting this unfortunate youth in a dungeon. After three years' imprisonment he was called the conspiracy of Cinq-Mars;—he was executed at Lyon, in his thirty-fifth year, on the 12th of September, 1642, not three months before Richelieu's own death.

The president De Tho is the author of a number of Latin poems, among which is the one published 'De Re Accipitraria' (on Hawking), which was published in 1584; but his fame rests upon his History or Temporis, or 'History of his own Time,' written also in Latin, but comprising the events of his lifetime, the remainder not till 1620. The space which it extends is from the year 1544 to 1607, comprehending the closing years of the reign of Francis I., the entire reigns of Henry II., Francis II., Charles IX., and Henry III., and nearly the closing years of that of Henry IV. For about one-half of this period of sixty-three years there has the value belonging to the narrative of one who was himself a principal actor in many of the affairs which he relates, and who with regard to many others was so placed as to have an opportunity of knowing details not concealed from the common eye; but in truth, from the author's family connections, and his extended acquaintance among the eminent and remarkable persons of his time. The style of his history is sometimes very tedious; but, as far as it is earlier as well as to the later part of the work. It is also admitted to have throughout the merit of a rare impartiality: with no deficiency of patriotic feeling, and perfect steadiness to his own political principles. De Tho is always ready frankly to recognise the high qualities of whatever kind, that may have belonged either to the citizen of a rival state or a party opponent. As for religious prejudice, he shows so little of it, that as to have expressed himself as a Protestant would have been a confession of not being really a believer in the form of Christianity, the Roman Catholic, which he professed. But for either of these charges there seems to be no ground. The reputation of his History however stands not so much upon the facts contained in it as the style with which they are written, as so much upon the material as upon the workmanship, and it is very evident that with all the pains he took in the making of information, this was the praise of which he was the most ambitious. It is said to have been the case with the most famous histories of every age and country, from Herodotus and Thucydides among the Greeks, and Livy and Tacitus among the Latins. His style is gallant and flowing, and his manner of writing, though flowing and eloquent, is not very picturesque; and of course he also loves something in richness and natural grace, ease, and expressiveness, by writing in a dead language. De Tho's Latin style, with all its merit, is not admitted to be faultless, though he his
taken great pains to give it as uniformly classical an air as possible, not only by metamorphosing all his modern names, both of places and persons, so as to give them antique forms, often to the no small perplexity and hindrance of the reader, but, what sometimes occasions a little confusion or ambiguity, by generally endeavouring to describe modern proceedings and transactions in the established legal, political, and military phraseology of the old Romans, a deficiencie of his works on African botany deprived him of the merit of introducing to the world new and valuable.

In his physiological works his views are ingenious, but in most cases wanting in sufficient data to establish them. His views on the formation of buds, the motion of the sap, and other things, are generally attended with a little more attention. But each of these is perhaps more indebted to the speciousness of its reasoning than to the correctness of the facts, for the importance that botanists have attached to it. But at the same time his great activity of mind, his extensive erudition and original observation, have had a great influence on the progress of botany in the present century. He was a contributor to the 'Biographie Universelle,' and wrote the lives of many of the botanists in that work. The genius of plants Thouars was named after him, and Bory St. Vincent named Aubertia in honour of him.

(Brog. Unv., Supp.; Bischoff, Lehrbuch der Botanik.)

THOURET, MICHEL-AUGUSTIN, an eminent French physician, was born at Paris, in 1788, at the time of the richest province of Normandy and the modern department of Calvados, where his father was royal notary (notaire royal). His education was commenced at his native town, where he was educated at a military school, and finished at the Collège Louis-le-Grand, but which he had to leave because of his poverty. He went to Paris, and in 1774 was admitted gratuitously by the Faculty of Medicine in that city to the degree of M.D., an honour which was gained by public competition (concours). A few years later, upon the foundation of the Comité des Sciences, Thouret was elected one of its earliest members, and enriched the Mémoires of the Society by several valuable essays. The most important public work in which he took a part was the exhumation of the bodies in the cemetery of the Holy Innocents of which he drew up a most interesting report. This cemetery, together with a church of the same name, stood on the spot now occupied by the Marché des Innocents, and had become in process of time so unhealthy from being the principal burial-ground in Paris, that it was absolutely necessary to destroy it. This great work had been several times attempted, but as often abandoned on account of the dangers and difficulties of the undertaking; but last however, in 1786, a committee was named for directing the works, which have been done without any accident, and by day for more than six months, and which were at length completely successful. Thouret afterwards filled several public situations with equal zeal and integrity; and in the midst of his labours of humanity, he died, after a few days' illness, by a cerebral affection, at Meudon, near Paris, June 19, 1810. Great honours were paid him after his death by the Faculty of Medicine at Paris, of which body he was dean. His works consist almost entirely of essays published in the 'Histoire et Mémoires de la Société Royale,' of which perhaps the most interesting are the 'Rapports sur les Exhumations du Cimetière des SS. Innocens,' mentioned above. These were afterwards published in a separate form at Paris, 1789, 8vo.

THIOROUT is a town in the province of West Flanders, in the kingdom of Belgium, in the district of Bruges, on the high road from that city to Menin and Courtray. It is a well-built town, with a population of 10,000 inhabitants, who have a considerable trade in linen, flax, and linen. They also manufacture hats, starch, and wooden shoes.

[FLANDERS, WEST.] (Stein, Lexicon; Schultz, Allgemeine Erdkunde, vol. xvii.)

THIRACE [Thiraca] was in earlier times the name of the country bounded on the north by the Danube, on the south by the Propontis and the Ægean Sea, on the east by the Black Sea, and on the west by the river Strymon, and the continuation of Mount Rhodope. This country is divided into two parts by Mount Hæmus (now the Balkan), which runs from west to east, separating the plain of the lower Danube from the rivers which flow into the Ægean Sea. This mountain probably derived its name.
from its cold and snow top, since Hamus seems to contain the same root as the Sanscrit Asauh, whence also aqua, one of the Himalaya Mountains. Two extensive ranges branch off from the southern side of Mount Hamus; one at about a hundred miles from the Euxine, which runs in a south-eastern direction towards Cotyra, the other, which is the larger, branches off near the sources of the Hebrus, and likewise runs to the south-east. The latter bore the name of Rhodope, and is now called the Despota Mountains. Between these two ranges there are many plains, which are drained by the river Hebrus, the principal river of Thrace, and its tributaries. For a further account of the physical geography the reader is referred to the articles Balkan Mountains and Maritza.

In the four districts of Thrace there was a great quantity of corn and wine grown in the valley of the Hebrus. In the 'Iliad' the ships of the Achaeans are described as bringing wine every day to Agamemnon from Thrace (ix. 72) and the Maronean wine, which retained its reputation in the time of Pliny (Hist. Nat., xiv. 6), is spoken of in the 'Odyssey' (ix. 179). In the mountainous parts of the country there were also mines of precious metals. (Justin, viii. 3.)

The Thracians were divided into many separate and independent tribes; but they were generally yielded to them collectively in very early times, Thrace, according to Stephanus Byzantinus (s. v. Θρᾴκη), was previously called Perce (Mies.). It signifies any country in the north, according to Ubert (Geographia) the country of the Thraci, i., i. the place where the Thracians dwelt. It is supposed that Thracians, who quotes the remark of Andron of Halicarnassus (Schol. ad Lycophr., 894, 1283), that Oceanus had four daughters, Asia, Libya, Europe, and Thrace, from whom the four parts of the world were named; and hence he concludes that Asia divided the east, Libya the south, Europe the west, and Thrace the north. This conclusion however hardly amounts to a small probability. Josephus and many Biblical scholars suppose that the name is derived from Tiria (Τήρια), the son of Japhet (Genesis, x. 2), but this opinion rests on little more than an apparent similarity of sound.

The Thracian nation, according to Herodotus (v. 3), was, not to the Indians, the most numerous of all, and it united under one head would have been invincible. He observes that the usages of the different tribes were similar, with the exception of the Getae (Γεταί), the Trausi, and those who dwelt above the Crestonei. The account which he gives of the most striking national peculiarities seems to be more a tradition than the Thracians dwelt. Representing them as a barbarous and savage people, which is supported by other ancient writers, though the districts on the southern coast seem to have attained to some degree of civilization, owing to the numerous Greek cities that flourished there in ancient times. The Thracians, says Herodotus (v. 6), sell their children to be carried out of the country as slaves; they do not guard their young women, but permit them to have intercourse with whatever men they please; they purchase their wives with great sums; they puncture or tattoo their bodies, which they regard as a sign of noble birth; agriculture they despise, and consider it most honourable to live by war and robbery. Deep drinking prevailed among them extensively, and they spread their cups beyond almost proverbial. (Hor., Carm., i. 18 and 27.) In earlier times, however, there must have been a greater degree of civilization among some of their tribes at least, that flourished under the influence of Bithynia, Asia Minor, Orphus, Linus, Musaeus, and others, are all represented as coming from Thrace; and Eumolpus too, who, according to tradition, the Eleusinian mysteries at Athens, is also said to have been a Thracian. At an early period likewise the Thracians spread extensively over southern Greece. Thucydides (i. 29) says that they once dwelt in Phoci: Strabo (iv. 401, 410) speaks of their settlement in Boreia; and their invasion of Attica under Eumolpus, who fought against Athens, is mentioned by many writers.

The Thracians are said to have been subdued by Sesostris (Herod., ii. 103), and subsequently by the Myians and Teucrians, who crossed over into Europe before the Trojan War, as related in Book xii. of the Iliad, for the Peneus. (Herod., vii. 20.) But the first real historical event respecting them is their conquest by Megabazus, the general of Darius, who conquered all the separate tribes, with the exception of the Salata, who were the only Thracian people that had retained their independence down to the time of Herodotus. (Herod., v. 2; vii. 11.) After the failure of the expedition of Xerxes, the Thracians appear to have recovered their independence, in the course of the Peloponnesian war, having an empire in Thrace, which was under the dominion of Sitalces, who is called by Thucydides (iv. 29) king of the Thracians. This empire was founded by the father of Sitalces, Teres, the king of the Odryae, and his son. It was extended along the coast from Abderus to the mouth of the Danube, a distance of four days' and four nights' sail with a favourable wind, and was by land a journey of eleven days by the shortest road for an active man: it included the districts of Leuvi and the Strymon, a journey of thirteen days. The tribute paid to Seuthes, the successor of Sitalces, was 400 talents, besides a great number of presents to himself and the Odryane nobles. Thucydides says that of all the kingdoms between the Ionian Gulf and the Euxine, this was the greatest in revenue and opulence, but that it was inferior to the Scythians in military strength and numbers. In the third year of the Peloponnesian war, n.c. 429, Sitalces, who had been driven out of Thrace by Persicus, king of Macedon, with an army of 150,000 men; but being disregarded in the co-operation of a Athenian fleet, he was persuaded by his nephew Seuthes to accept the overtures of Persicus, and in return home, he was returned from Persia, when a Macedonian thirty days. In the year n.c. 424, Seuthes fell in battle against the Triballi, the most powerful Thracian people between Mount Hamus and the Danube, and was succeeded by his nephew Seuthes. The power of the Scythians in this district of the Black sea. The period of more than twenty years from the death of Sitalces it had lost its former greatness; and when Xenophon crossed over into Thrace, in n.c. 400, he found Medorus, the ruling king of the Odryae, in the midst of a state of rebellion. (Compare Arri., i. 2, s. 32, &c.) In the reign of Philip, the father of Alexander, Cotys was the most powerful of the Thracian chiefs, and is usually called king of Thrace; but he was deprived of Philip of almost all his dominions by the Sardis, and the Nestus, and became little else than a vassal of the Macedonian kingdom. He was a savage and incontinent barbarian, and was assassinated in n.c. 306. On his coronation of Seuthes succeeded to the throne; but he was assassinated in B.c. 343, the whole of Southern Thrace at last, when the Persians placed the Thracian subjects. (Diodor., xvi. 71.) On the death of Philip there was a general movement among the Thracians, which swept over the whole of Thrace, and in which the Triballi placed themselves. But Alexander, by his activity, suppressed this rising: he crossed the Haunus, marched into the country of the Triballi and, after defeating them, advanced as far as the Danube, which he crossed, and offered up a sacrifice on the banks of the. (Livy, xliii. 10.) On the death of Alexander, Thrase fell to the share of Lydia, which erected it into an independent monarchy: but it subsequently came under the dominion of the Macedonian kings. They seem however to have left the country under the government of its native rulers, and were probably conformed to what the Greeks called a hegemony. In the Roman war against Persicus, Cotys, king of the Thracians, contributed three thousand horse, and five thousand foot, but just before the war broke out, had sought the alliance of the Romans. (Livy, xliii. 28, 51; compare xliii. 19.) On the conclusion of the war, however, Cotys was allowed to continue in possession of his kingdom, notwithstanding the assistance he had rendered to the Romans. (Livy, xliii. 42.) At what time Thrace was reduced to the form of a Roman province is uncertain, but it seems not to have constituted a distinct province till a late period. Under Augustus, the part of Thrace north of the Haunus was cut off, and formed a separate province under the name of Moesia. (Moesia) The name of the Thrace was then confined to the country south of the Haunus, and between the Euxine, the Propontis, and the Bosporus. The Thracians are said to have been divided into various times: in the time of Ptolomey (iii. 11) it is said that they had been the Nestus; but as the Strymon was named, the boundary between Macedonia and Thrace, it will be
convenient, in the following description of the principal places in Thrace, to consider the district between the Styron and the Nestus as belonging to the latter country.

Beginning then on the left bank of the Styron, the first town we come to is Amphipolis, which was founded by the Athenians, and was one of the most important towns and the middle of the old time of Demosthenes. It was situated on an isthmus, which formed the narrow neck of the country of the Edones, who dwelt between the Styron and the Nestus, but originally inhabited the Macedonian district of Mygdonia. (Thucyd., ii. 99.) The next town of the south from the Styron was the city of Dicemade, which was a Greek city on the shores of the lake Biston (Herod., vii. 109); and then Maroneia and Trasianus, which were both in the country of the Cicones, who had been removed thither by the Athenians after they had taken their city. (Odys., xi. 39, &c.) The Maronean wine has been already mentioned, and the city was in consequence sacred to Dionysus, as may be seen from its coins. It was originally called Orthagoria. Its ruins are still inhabited, and are of interest in the history of its later history. In its early days it was inhabited by Xerxes, whose army, we are told, was destroyed there. (Herod., v. 56.) Crossing the head we come to Axios, which, according to Virgil (Aen., iii. 17, &c.), was founded by Aeolus, but it is mentioned under this name by Homer, as the place from which Perus came across the isthmus to the Trojan war (H., ii. 520). It was a place of considerable importance in later times, and under the Romans was a free town. (Pliny, Nat. Hist., iv. 18.) It is still called Enos.

After arriving round the head of the Gulf of Melas, now the Gulf of Saros, we come to the Thracian Chersonese (Χίλμυχηνος, or Χῖλμυχηνος ἣ ἐν Ορύδα), now Gallipoli, which was very early colonized by Greek settlers, and though but of small extent in ancient history, in early times it was inhabited by the Dolonci, a Thracian tribe, which being hard pressed in war by the Apisonithi, were led to invite Miltiades, the son of Cypselus, an Athenian, to be their king, in consequence of an offer given them by the oracle at Delphi. This was about the year B.C. 500. Miltiades complied with their request, and took with him to the Chersonese a colony of Athenians. On his death he was succeeded by his nephew Stesagoras, and by his brother Miltiades, the son of Cimon, who fled to Athens to escape the vengeance of Darius, on account of the advice he had given to the Ionian chiefs in the Scythian expedition of Darius. (Herod., vi. 34, &c.) [MILTIADES].

When the Persians were driven out of Greece, this part of Thrace was freed by the inhabitants of the Thracians, who retained it till the end of the Peloponnesian war. Shortly afterwards the Lacedaemonians, at the request of the inhabitants, built a strong wall across the isthmus to protect the country from the incursions of the Thracians. (Xenoph., Hell., iii. 2, v. 8.10.) It subsequently came under the power of Athens, who wrested it from Cersoboleptes, the son of Cotys, when he was deprived of his other dominions by Philip. Afterwards it formed part of the kingdom of Lysimachus, who enriched the city of Aristarchus, which he made his capital. It was on the western side of the isthmus, not far from the ancient Cardia, the inhabitants of which he removed to his new city. (Diodorus, xx. 29; Pausan., i. 8, s. 10.) South of Lystra there are some remains of the town of Nestus, the last of which was only of any importance. It was an Arian colony, and was one of the chief towns of the Chersonese in the time of Demosthenes. On the eastern side of the Chersonese, upon the Hellespont, the most southerly town was Cymecona, near which the Lacedaemonian fleet was defeated by the Athenians under the command of Thrasybulus and Thrasyllus, in B.C. 411. (Thucyd., viii. 104, &c.) Above Cymecona was Madytus, which was also one of the chief towns of the Chersonese in the time of Demosthenes; and was the capital of a district, which was assigned to Thrasyllus, who was in consequence in obtained possession of Athens and put an end to the Peloponnesian war. Above Madytus were Callipolis, now Gallipoli, which has given its name to the peninsula, and Paetia, opposite Lymania.

As the other towns are not of so much importance as the preceding, a brief notice of them will be sufficient. For the Propontis the chief seaport was Perinthus, afterwards called Heraclea, and sometimes also Hercules Perinthus. (Zosimus, i. 62; Diodorus, xvi. 76.) On the Bosphorus (not Bosphorus, as it is frequently, but incorrectly, written in modern maps and works), which connected the Propontis and the Euxine, the antient Greek city of Byzantium was situated, on the isthmus of the site of the modern Constantinople. (BYZANTIUM).

On the European coast of the Euxine the chief towns were Salmycussus, Apollonia, and Mesembria. The two former were colonized by the Milesians, and the last by the Megarians. (Strabo, vii. 319.) In the interior of the country the towns most worthy of mention are Trajanopolis, on the Egdonian road to the west of the Hebrus; Plotinopolis, so called in honour of Plotinus, the wife of the Emperor; Hadrianopolis, on the Hebrus, originally called Orestias, and now Adrianopole (ADRIANOPOLIS); and, lastly, Philippi, also on the Hebrus, now called Filibi. The names of these towns sufficiently show by whom they were built or enlarged.

The Via Egnatia, which was the great road of communication between the Ionian Sea and Byzantium, and which is spoken of under Macedon (p. 245), entered Thrace at Amphipolis, and passed by the towns of Philippi, Neapolis, Abdera, Maximianopolis, Trajanopolis, Cyzecna, Apier, Heraclea, till it reached Byzantium. Xenophon, in his 'Anabasis' (vi. 4), speaks of Thrace in Asia, which he describes as extending from the junction of the Bosphorus and the Ponto, and as far as Heraclea: the country within these limits was inhabited by Thraci Bithyni. The harbour of Calpe was about the middle of this coast-line. (BITHYNIA.)

THRACIA. A district of Thrace, of which testaceous mollusks described as intermediate between Anatina and Mya, and as having some resemblance to Corcula. THRASTPASSON. [NORTHAMPTONSHIRE.]


THRASEA PAETUS. His praenomen is uncertain; some writers call him Lucius, and others Publius, but he is generally called simply Thrasea Paetus or Thrasea. He was a native of Patavium, Padus (Tartitus, Anton., xvi. 21: Dion Cass., lxxii. 26), and, like most men of talent at the time, he went to Rome, where he afterwards became a senator and a member of the priestly college of the quindicemvir. The first time that Thrasea appeared in the list of the twenty-four was in B.C. 59, when a senatorial consul was passed by which the city of Syracuse obtained permission to employ a larger number of gladiators in the public games than had been fixed by a law passed in the years of 75, 65, and 49; (Dion Cass., liv. 2; Sueton., CA ACCESSO.) Although the matter was of no importance, Thrasea took an active part in the deliberation, merely to impress upon his colleagues the necessity of paying attention even to matters belonging to the administration of the senate. In the same year Nero determined to carry into effect his design of getting rid of his mother Agrippina. (NERO; AGrippina.) When the crime was committed, and when Nero, fearing his advancement, which he endeavoured to extinguish himself, the degraded senators congratulated him upon having got rid of so dangerous a woman. The only man who on that occasion had the
courage to show his detestation of the crime was Thrasea. (Dion Cass. xii. 15; Tacit., Annal., xiv. 12.)

In the year A.D. 62, when the praetor Antius was charged by Cosutianus Capito with high treason for his commission, and who was accused at his trial of some libellous verses upon the emperor, and when the emperor showed an inclination to interfere in the trial, Thrasea boldly claimed for the senate the right to try the case according to the ancient law, and it was the firmness of the senator to follow his example and to vote with him. Cosutianus was thwarted in his hope of getting Antius sentenced to death, and the emperor, though highly annoyed, endeavoured to disguise his disapprobation. In this way Nero, who enjoyed no approbation, was made to feel his own importance.

A short time afterwards Thrasea again attracted general attention in the senate by a speech against the assumption and insolence of wealthy provincials. It had at that time become customary with the provincials to request the Roman senate, by embassies, to offer public thanks to the provincials who returned from their province, and who had conducted the administration to their satisfaction. The ambition to gain this distinction often deprived the provincials of their independence, and degraded them into flatterers of influential provincials, who thus obtained an improper power.

Thrasea proposed to the senate a measure to remedy the evil, but although it met with general approbation, he did not succeed in making the senate proceed to its execution. He did, however, after the proposal of Nero himself, (Tacit., Annal., xv. 20-22.) Nero already hated Thrasea, and envy now began to increase the hatred. When therefore, in A.D. 63, Plutarchi, the historian, was convoked by Nero, was subjected to a very severe interrogatory; being her companion in the service of Antius, and all the senators flocked thither to wait for the event, Thrasea was forbidden to go there.

The Stoic philosopher bore this insult with his usual calmness. Nero afterwards declared to Seneca that he was reconciled to Thrasea, but this was probably no more than an expression of his fear. The inflexible character of Thrasea, his refusal to take any part in the degrading proceedings of the senate, and the esteem which he enjoyed among his contemporaries, increased the hatred of Nero. But on one occasion Nero gave him an opportunity to rid of him. It appears that from the year A.D. 63 Thrasea never attended the meetings of the senate. Three years thus passed away, when at length, in A.D. 66, his old enemy Cosutianus brought forward a number of charges against Thrasea, the substance of which, was that he took little or no part in public affairs, and that when he did so, it was only to oppose the measures of the government; that he was a secret enemy of the emperor, and fulfilled neither his public nor his private duties. Thrasea was tried and condemned as a priest. Thrasea first requested a personal interview with the emperor, which was refused. He then wrote to him, asking for a statement of the charges against him, and desired he should refute them. When Nero had read this letter, instead of which he had expected a confession of guilt and an humble petition for pardon, he convoked the senate, to decide upon the charges against Thrasea and others. Some of Thrasea's friends advised him to attend the meeting, but most dissuaded him from it. One young and spirited friend, Rusticus Arulenus, who was tribune of the people, offered to put his veto upon the senatus-consulium, which however Thrasea prevented. The philosopher now withdrew to his country-house. He was prevented from being seized by armed bands, the quaestor of the emperor read his oration, whereupon Cosutianus and others began their attacks upon Thrasea. The wishes of Nero, and the presence of armed soldiers ready to enforce them, left the senators no choice, and it was decreed that Thrasea, Soranus, and Servilia should choose their mode of death, and that Helvidius, the son-in-law of Thrasea, and Paccioni, should be banished from Italy. The accusers were minutely rewarded.

The tribune of the people, however, a friend of the philosopher, a friend of the philosophers, a friend of the soldier, and a friend of the people, was sent to Thrasea, who had assembled around him a numerous party of friends and philosophers; but before he arrived, a friend, Domitius Cassius, came to inform him of the event; the senate, which spread consternation among all who were present, was attended by the wife of a woman who was a relative of Persius the poet (Vita A. Persii Marci), was on the point of making away with herself, but her husband entreated her not to deprive her daughter of the last support which now remained to her. When at length the quaestor arrived and officially announced the decree, Thrasea took Helvidius and his friend Domitius Cassus to his bed-room, and had the veins of both his arm opened; after he had performed these acts, he said, 'Dear deliverer, accept this libation.' (Tacit., Annal. xvi. 21-31; Dion Cass., xiii. 25.)

Thus died Thrasea, according to the unanimous consent of the ancients a man who professed the genuine and stern philosophy of the Stoics. He was a true friend of Thrasea; Tacitus calls him virtue itself, and even Nero is reported to have said, 'I would that Thrasea liked me so much as he is a just judge.' (Plutarch, Rei Publicae, c. 77, p. 451, ed. Pisc. n. 36; Polyb. Epit. viii. 25.) The principles which guided him through life he had imbibed from the Stoic philosophy. Cato the younger was his favourite character in the history of the Roman republic; he wrote a Life of Cato, which Plutarch made use of in the first place, and thus we probably still possess the substance of it. (Plutarch, Cato Min., 25 and 37; compare Heerem, De Pontibus Plutarchi, p. 168.) Rusticus Arulenus wrote a work on Thrasea and Helvidius, in which he characterised them as men of the purest integrity—an expression which became fatal to the author. (Suétion, Domit. 10, Tacit., Agric., 2. and 45.)

THRASING. The separation of the grain from the ear in corn has always been a laborious and disagreeable farm. Where the quantity grown is very sufficient to supply food for the cultivators of the soil, the simplest methods answer the purpose sufficiently. The corn taken by handf s may be beaten on a piece of wood, and the straw, with its point uppermost, may be readily beaten out. This mode of thrashing is still adopted in order to obtain the finest and ripest grains for seed; but then the straw is afterwards thrashed over again with the foot, which is the same operation most generally performed by the women. It is needless to describe this instrument, which is so generally known. It requires some practice to use it effectively, and to avoid accidents to the thrasher himself or the by-standers. It is the custom still being abroad that a part of it is made to fall horizontally on the straw, which is spread on the threshing-floor; and, by inserting the part occasionally under the straw, it is turned over and a larger portion is brought up to be beaten. This is done without losing the stroke or time when several men are threshing together. If we were not that thrashing is mostly done in winter, when no out-door work could well be done, few labourers would submit to its toil; and it is very difficult to ensure the entire separation of the grain without great vigilance. The corn is often left to the attention of religious persons, as the publicans, or overseers. If the labour is paid by the day, much time is usually lost; and if it be by the quantity of grain thrashed or by the number of sheaves, there is a great temptation for the men to save the thrashing as more grain is thrashed out at first when the ears are full of straw.

Where the corn is thrashed immediately after harvest, to be put into a granary, as is the case in those countries where extensive tracts of rich land are sown with corn two or three times without much tillage or manuring, and there left to be recruited by several years' rest and pasture, the most common practice is to level a portion of a field, and laying the corn in the straw in a large circle, to drive oxen and horses over it till it is all trodden out. This is a system of manuring, and is applicable to some, but not all, places where the climate is serene and dry. Tillenuity had produced machines to supersede the flail, the was the only instrument in use. The first idea of a machine for thrashing was that of imitating the motion of the flail, but so much depends on the eye of the operator, that no mechanism could well imitate the motion of the flail. This was consequently given up, and an imitation of the rubbing of the grains from the ears between the two sides of a large and heavy grinding wheel, or a pair of grind-machines, gradually produced the present improved threshing-machine.

Without a figure it would be difficult to describe the different parts and motions of a threshing-machine. They are explained more clearly in the description of a machine raised from the general principle of action, and to mention some of the latest improvements in it. A rapid motion is given to a hollow cylinder round a horizontal axis; on the outer surface there are projecting ribs parallel to the axis at
equal distances from each other; the width of these is from two to six inches. Around half the cylinder is a case or beehive, which is grooved in the direction of the axis. The ribs or beaters come quite close to these grooves, so that an ear of wheat or other corn cannot well pass between them. Should a corn kernel be sent with a fluted cutter they are torn out; but a non-fluted, or smooth, is carried between the beaters and the fluted case, and when it has made half a revolution all the grain from the ear is cut from it. The straw, having been thrashed through, but being too coarse to pass the screen, is allowed to pass out by hand or by circular rakes moved by the machinery. Some of the best implement-makers in England have found the two rollers superfluous, and have accordingly dispensed with them. The straw is at once subjected to the beaters, and the machine may be fed more or less rapidly according to circumstances. It requires a little more attention in the person who feeds the machine, but much less than mowing.

The construction of a thrashing-machine is to cut out every grain and to break the straw as little as possible; the larger the scale of the machine the better it does this. Hand-machines have been made on the same principle with this object in view; and many men would require many men to produce the effect of one horse. The great advantage of hand-machines is that men and women can be employed to thrash who could not use the bail skilfully. Machines or revolving-machines are now extensively used in England where the farms are small. They are often the property of an industrious labourer or mechanic, who undertakes to superintend the work, the farmer finding horses and men. Thus he goes from farm to farm and earns his livelihood from a small capital laid out in the purchase of a machine. The price of thrashing in this way is about half of what is usually paid for threshing with the flail; it is more rapidly done, there is less chance of pilfering, and fewer grains remain in the straw.

On very large farms it has been found economical to erect a steam-engine to work the thrashing-machine, shaf-tcutter, and other domestic implements. Where coals are cheap there is a great saving. A steam-engine costs little to keep it in order. When not working, the interest on the original price is the only loss, whereas horses must be fed whether they work or not. The price of steam-engines is so much reduced and their construction so simplified, that they will probably soon form an essential part of the equipment on every farm.

There are some thrashing-machines on a new principle which are said to work well. The drum is furnished with rows of spires, and similar spires are fixed into the cover, which work in the intervals between the first. The cover is drawn in by the crank on the drum, which revolves rapidly, and the ears being beaten in all directions by the fixed and the revolving spires, the grain falls out of the ear and is collected below. Such a machine was exhibited at the Agricultural Hall in Cambridge in the summer of 1886, but it seemed to break the straw more, and to be more apt to clog, than the machines in general use. These will no doubt be made gradually simpler and cheaper, till they entirely supersede the flail, even in very small farms.

The first council of the oligarchal party at Athens gained the ascendancy, and formed a new senate of 400 members. The oligarchs in the fleet stationed at Phyle and in the fleet stationed at Elateia took advantage of the situation, and by a similarity of action, but their efforts failed; and among the men who exerted themselves to maintain the democratic constitution, Thrasybulus, who then had the command of a trireme, was foremost. He and his friend Thrasyllus consecrated themselves to that cause, and attempted to secure the rest of the people of Athens, and in an assembly of the camp Thrasybulus got a decree passed, by which Alcibiades, who had lately been the chief support of the democratic party, and who was living in exile with Tissaphernes, should be recalled. Thrasybulus set out to fetch him, but was overtaken on his way to the camp (399 b.c.) by the Athenians who had greatly contributed to the victory which the Athenians gained in the battle of Cyzicus. In b.c. 408, when Alcibiades returned to Athens from Byzantium, Thrasybulus was in command in her eighty galleys to the coast of Thrace, where he restored the Athenian fleet to its old activity and spread ruin and terror in most of the revolted towns; and while he was engaged here he was elected at Athens one of the generals, together with Alcibiades and Conon. In b.c. 406 Thrasybulus was made the interior officer of the galleys, and was the first to break the fleet during the battle of Arginusae; and after the battle he and Themistocles were commissioned by the generals to save the men on the wrecks: but a storm prevented their executing this important service. In order to respect the fates of the generals and the conduct of Themistocles on this occasion, he re- namened Thrasybulus. Thrasybulus is not charged with any improper act during the proceedings against the generals, and for two years after his name does not occur in the history of Attica.

During the government of the Thirty Tyrants at Athens, he was sent into exile, and took refuge at Thebes. The calamities under which his country was suffering roused him to exertion. The spirit which prevailed at Thebes against the Thirty, and against its partisans at Athens, emboldened him to undertake to make the Thirty suffer. With a band of about seventy, or, according to others, of only thirty fellow-exiles, he took possession of the fortress of Phyle, in the north of Attica. The Thirty, sure of victory, made a garrison of the houses of the Athenians whom they had left in the enjoyment of a kind of franchise, and the knights, the only part of the population of Athens who were allowed to bear arms. On their approach to Phyle some of the younger men, eager to distinguish themselves, made an assault upon the place, but were repelled with considerable loss. The oligarchs then determined to reduce the fortress by blockade; but a heavy fall of snow compelled them to return to Athens. During their retreat the oligarchic party, which had not been immediately increased to 700, as the Athenian exiles flocked to him from all parts. With this increased force he one morning descended from Phyle, surprised the enemy, and slew upwards of 120 hoplites and a few horsemen, and put the rest to flight. Thrasybulus erected a trophy, took all the arms and military implements which he found in the enemy's camp, and returned to Phyle.

This thirty now began to be alarmed at the success of the exiles, and thought it necessary to secure a place of refuge in case the exiles should succeed in getting possession of Athens. For this purpose they, or rather Critias, Thrasybulus, and Alcibiades, proposed a most anachronistic measure, which was never carried into effect: they proposed to secure 300 citizens of Eleusis and Salaminis capable of bearing arms; and after they were conveyed to Athens, he compelled the 3000 and the knights to condemn them to death. All were accordingly executed, and the city was deprived of a part of its population to which it might have looked for protection. In the meantime the number of exiles at Phyle had continued to increase, and now amounted to one thousand. With these Thrasybulus marched by night to Piraeus, and by the aid of numbers of other exiles immediately increased his army. The Thirty no sooner heard of this movement than they marched against Piraeus with all their forces. Thrasybulus by a skilful maneuvre obliged the enemy, who was superior in numbers, to occupy an unfavourable position at the foot of the hill of Munychia. In the ensuing battle the army of the tyrants was put to flight and driven back to the city. Critias fell in the contest.

The consequences of this success showed that there had been little unity among the oligarchs, and that an open breach had only been prevented by fear of Critias. Some of the Thirty and a great many of the 3000 were in the meantime sent back by the side of the tholos, and permitted, and had avoided, as much as they could, taking part in the rapine and bloodshed. They also were aware that the hatred and contempt under which they were
labouring were owing mainly to the violence of their superiors; and for the most part of obtaining their own power they were inclined to sacrifice their colleagues. An assembly was held in which the Thirty were deposed, and a college of ten men, one from each tribe, was appointed to conduct the government. Two of these ten had formerly belonged to the Thirty, and the rest of the Thirty went to Eleusis. As regards the army of exiles under Thrasybulus, the new government of Athens was no less determined to put them down than the Thirty had been. Thrasybulus therefore continued to strengthen himself, and he now offered to the army, which had gradually become more numerous than that of Athens, for he engaged aliens in his service, and promised them, in case of their success, the same immunities at Athens as those enjoyed by the Lemnians (foes—shared); of which he was still in want, were generally supplied by the wealthy citizens of Piraeeus and other places, and by the ingenuity of his own men. As the danger from the exiles became at last very imminent, the Ten of Athens applied to Sparta for assistance. At the same time the faction at Eleusis also sent envoys to Sparta; but the government of Sparta refused to send an army for an undertaking from which it could reap no advantages. However Lysander, who desired leave to convey an army, of which his brother Libys was appointed admiral to blockade Piraeeus, Lysander went to Eleusis, and got together a numerous army. Being thus encamped by land and by sea, Thrasybulus and his army had no prospect except to surrender.

But the Thirty, who considered that their hour had come found it more prudent to act when they could least have been expected. The power and influence which Lysander had gradually acquired, had excited the envy of the leading men at Sparta, even of the ephors and kings, and they were bent upon bringing him to book. King Pausanias was accordingly sent out with an army to Attica, avowedly to assist Lysander in his operations, but in reality for the purpose of preventing the accomplishment of his designs. He encamped near Piraeeus, as if he desired to become the place in conjunction with the other forces. After several sham manoeuvres against the exiles, Pausanias gained a victory over them without following it up. He now sent secretly an embassy to them, requesting them to send a deputation to him and the ephors; and he also suggested the language which the deputies should use. At the same time he invited the pacific party at Athens to come to meet and make a public declaration of their sentiments. Hereupon a truce was concluded with the exiles, and a deputation of them, as well as of the pacific party at Athens, was sent to Sparta to negotiate a general settlement of affairs. As soon as the Ten of Athens heard of this, they also sent envoys to Sparta to oppose the other attempt, which failed, and the ephors appointed fifteen commissioners in conjunction with king Pausanias, to settle all the differences between the parties in Attica. In accordance with the wishes of the exiles and the peaceable party of the city, the commissioners appointed a general assembly, from which none were to be excluded except the Thirty, the Eleven, and the Ten who had formed the government of Piraeeus. Any one who might not think it safe to return to Athens was permitted to take up his residence at Eleusis. This clause is unintelligible, unless we suppose that the Spartans still wished to see Eleusis in the hands of a party which might check the reviving spirit of independence among the Athenians. Sparta guaranteed the execution of the proposals of Pausanias; followed by his forces, Thrasybulus at the head of the exiles entered Athens in triumph, and marched up the Acropolis to offer thanks to Athens. An assembly was then held, in which Thrasybulus invited all parties the necessity of strictly observing the condition of the peace.

Eleusis was now the seat of the most violent of the oligarchical party, and they still indulged some hope of recovering what was lost. They assembled a body of men to march against the civil war, and its result, strong force against them. Xenophon says that the leaders of the Eleusinian party were drawn to a conference and then put to death. This isolated statement is rather surprising, as in an assembly of the popular party the greatest moderation, and immediately after the diet settling the conditions of the oligarchian rebellion Thrasybulus induced the Athenians to proclaim a second amnesty, from which no one was to be excluded. This amnesty was faithfully observed. The first step after the abolition of the oligarchy was the passage of a decree which restored the democratic form of government.

Thrasybulus acquired the esteem of his fellow-citizens by the courage and perseverance which he showed in the deliverance of his country, and although for many years he does not come forth very prominently in Xenophon's works, he was an able leader, and to his former greatness, than he had been in trespassing from the hands of his enemies. His last military undertaking belongs to the year B.C. 393, when the government of Athens was placed in a feeble condition, and he was sent to crushing Alcibiades, who, with which he was to support the democratic party in the island of Rhodes. On his arrival there he found that his protection was needed, and he sailed to the north part of the island. In Thrace he settled a dispute between the cities of Eleusis and Chalcodon, and the Athenian influence restored, and with it new sources of revenue to the republic were opened. After this he sailed to Mitylene, the chief town in the island of Lesbos, in which Sparta had not gained the ascendency. Thrasybulus here fought a battle with Theramachus, the Spartan haemorhous, who was defeated and slain. Several towns were now reduced and after he had plundered the lands of those who remained, he returned to Athens, he prepared to sail to Rhodes, but before he landed there, he sailed along the southern coast of Asia Minor to levy some contributions there. His fleet was anchored in the mouth of the river Eurymen in Pamphylia near Aspendus. In consequence of some outrage committed, he set sail for his residence in Pamphylia. At Eleusis he was again called out to the Peloponnesian War, and during the night they surprised and landed Thrasybulus in his tent, in B.C. 393.

(Thucydides, viii.; Xenophon, Hellen., i. 12, 15, 13; ii. 3, 48, 12; iv. 2, 4, 2.; ThraSybuLus, in Cosmograph. Hellen., viii.; Xenophon, Hellen., v. 1, 26, &c.; compare Nicias ed Clisophon, p. 73, ed. Steph.)

THRASYBULUS (Θρασύβουλος), of Collytus in Attica, was a contemporary of Thrasybulus, the deliverer of Athens, from whom he is usually distinguished by the epithet of the Collytian. He was one of the Athenian exiles who joined his namesake Thrasybulus to Phyle and afterwards Piraeeus. (Demonœthnœ, in Timotheus, p. 742.) He was in war against Anticleas he commanded eight Athenian galleys, with which he was taken prisoner by the Spartans.

Xenophon, Hellen., v. 1, 26, &c.; compare Nicias, ed. Clisophon, p. 73, ed. Steph.)

THRASYBULUS (Θρασύβουλος), a tyrant of Syracuse. He was a son of Gelo, and brother of Hiero the Elektrion, who ruled over Syracuse till the year B.C. 468. His father Gelo was the founder of a tyrannical dynasty which maintained itself for nearly a century, and his son Hiero, his successor, was a bloodthirsty tyrant, and oppressed the people more than Hiero: great numbers of citizens were put to death and others sent into exile, and their property filled the public treasury. Gelo's brother, from whom he derived his name, was at all events against the exasperated citizens, he got together a force of mercenaries, and relying on this new support he carried his reckless cruelties so far, that at last the Syracusans determined to rid themselves of their tyrant. These leaders give them a military organization that they might be enabled to resist the incursions of Thrasybulus. The tyrant at first endeavoured to stop the insurrections by persuasion, but this attempt failed, and he sent envoys from Naxos and other places, and also engaged new mercenaries. With these forces consisting of about 15,000 men, he occupied that part of the city which was called Achradina, and the fortified area of the town which was occupied by the citizens, so as to harass frequent sallies of the citizens, who for the most part retired to the country. The Syracusans delayed to take the city, and they waited until the Syracusans had sent envoys to several Greek towns on the interior of Sicily, soliciting their aid. The request was readily complied with, and they soon had an army and fleet which they sent against Thrasybulus. Thrasybulus attacked them both by sea and land, and his fleet was driven to the island after the loss of several triremes, and the army was obliged to retreat to Achradina. Seeing no possibility of maintaining himself, he sent envoys to his pirates to solicit their aid, he was granted on condition of his quitting Syracuse. Thrasybulus submitted to these terms, after having scarcely reigned one year, and went to Locri in Southern Italy, in B.C. 406.
improvements effected by Arkwright and his successors in spinning-machinery, and forms a considerable branch of business both in Manchester and in Scotland, for exportation as well as for home consumption.

The operation of combining yarns of cotton or linen into thread is performed by a machine called a doubling and twisting frame, somewhat resembling the throttle of the cotton-spinner. Engravings of this machine, with a minute description, are given in Dr. Ure's 'Cotton Manufacture of Great Britain,' vol. ii., pp. 220-234, and 'Dictionary of Arts,' pp. 1230-1241, from which authorities the following account is derived. Along the centre of the machine is an elevated creel or frame-work, which supports two parallel rows of cops orobbins of yarn, one row towards each side of the machine. The cops or bobbins are placed vertically, or nearly so, and the lower ends of their axes rest in oiled steps or hollows, while the upper ends are supported by wire eyes, so that they may revolve with facility. The number of cops or bobbins of yarn is twice as great as that of the doubling spindles when the thread is to consist of two yarns, three times as great for thread formed of three yarns, &c.; and the yarn with which they are charged is frequently 'gaussed,' or passed quickly through a series of coal-gas flames, to singe off any loose downy fibres, before it is taken to the doubling and twisting frame. From the cops the yarns are conducted over horizontal glass rods, which are fixed parallel with the creel, and thence downwards into troughs filled with water or very thin starch-paste, which by moistening the yarns facilitates the subsequent process of twisting. To ensure the equal moistening of the yarns they are, while being drawn through the troughs, made to pass either under a glass rod, or through the eyes which may, if necessary, be lifted out of the trough without wetting the fingers, by means of upright stems provided for that purpose. The wetting-troughs and other apparatus are alike on each side of the machine; but in order to further tracing the progress of the thread, we shall confine our attention to one side, and to the apparatus necessary for producing one thread, although a great number of such trains of apparatus are combined in one frame, and set in motion by one train of impelling machinery. After being wetted the yarns pass over the rounded edge of the trough, which is covered with flannel for the purpose of absorbing the superfluous moisture; and then under and partly around an iron roller, which is made to revolve with any required velocity by a train of wheel-work. Upon this roller rests another, of box-wood, which revolves solely by contact with the iron roller, its axis playing in vertical slots. In passing under the iron roller, then between it and the wooden roller, and finally over the latter, the yarn required to form the thread are brought together and slightly compressed; but although thus prepared for a more intimate union, they are not yet twisted together. The action of the winding and twisting apparatus may be illustrated by a diagram, in which none but the essential parts are shown. In this figure a a represents the untwisted thread, or rather the united yarns which are to form the thread, and b is a fixed eyelet through which they are conducted to the flyer c, which is mounted upon and revolves with a long vertical spindle set in motion by a whirl or pulley and strap at d. e is the bobbin upon which the finished thread is wound by the revolution of the flyer, which also gives to it any predetermined degree of twist. The spindle passes freely through a hole in the

centre of this bobbin, which rests upon a bar called the cooping-rail, the transverse section of which is indicated

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by a tint in the cut; and the coppering, which extends the whole width of the machine, is supported at intervals by vertical rods, one of which is shown at \( f \). To these rods, and consequently to the coppering-raid and bobbins, support is given. The reciprocating motion is imparted through the connecting pieces \( g \) and \( h \), from the bent lever \( i \), which is pivoted at \( k \), and receives its motion through the adjustable friction-roller \( f \), from an eccentric \( m \). Thus the combined rotating motion of the spindle and flyer, and rising and falling motion of the bobbin, the thread is at once twisted and wound regularly upon the bobbins, which may be easily removed when full. It is unnecessary to detail the contrivance for regulating the rate of twisting, and the thread is wound upon the bobbins, as the required quantity is necessary, so that the rollers may be made to do so to any required degree, so as to impart a greater or less degree of twist to the thread.

Silk thread is, according to Dr. Ure, commonly twisted in lengths of from fifty to a hundred feet, with hand-reels somewhat similar to those employed in rope-making.


**THREATS AND THREATENING LETTERS.**

By the criminal law of England, threats of personal violence, or any other threats by which a man of ordinary firmness and prudence may be put in fear, and by means of which murder or manslaughter is exteriorly suggested to him, amount to the crime of robbery. (Roskam.) And by the statute 7 Will. IV. & 1 Vict., c. 87, sect. 7, a person demanding by menaces any property of another with intent to steal the same, is declared to be guilty of felony, and is liable to imprisonment for any term not exceeding three years. Besides these offences, it is a misdemeanor at common law to threaten another in order to deter him from doing some lawful act, or to compel him to do an unlawful one, or to extort money or goods from him, or to obtain any other benefit to the person who makes the threat.

The offence of sending or delivering letters or writings, threatening to kill or injure the person to whom they are sent or delivered, or to burn his house, or to accuse him of some heinous crime for the purpose of extorting money, was formerly considered to be high treason (stat. 8 Hen. V., c. 6); and under the stat. 9 Geo. I., c. 22, continued for more than a century to be punishable as a capital felony. (Ibid., c. 54, s. 3, it was declared to be desirable that a less punishment should be substituted for that of death; and it was enacted that, 'if any person shall knowingly and wilfully send or deliver any writing, with the name or signature thereof, or with a fictitious name or signature, threatening to kill or murder any person, or to burn or destroy his house, out-house, barn, or stacks of corn or grain, hay or straw, the offender shall be guilty of felony, punishable with transportation for life, or not less than seven years, or imprisonment for any term not exceeding seven years.' By a more recent statute, 7 & 8 Geo. IV., c. 22, sect. 8, it is enacted that, 'if any person shall knowingly send or deliver any letter or writing threatening or endangering to accuse, any person of any crime punishable by law with death, transportation, or pillory, or of any assault with intent to commit any rape, or of any attempt or pandering to commit any rape, or of any infamous crime (the meaning of which is defined by section 140, 2, 31 Geo. III., first and second of one kind, a fourth is found such that the four are in proportion, or that the first is the same multiple, part, or parts, of the second, which the third is of the fourth.

In the earliest modern treatises are found the formula

\[
\frac{a}{b} = \frac{c}{d}
\]

The importance of the rule of three induced mathematicians to attach two other rules to it; the inverse rule of three, which is defined by section 140, 2, 31 Geo. III., and the double rule of three. Some of the writers of Greek school, apparently by an abbreviation of his words, so that the rule of three inverse is used 'when less requires more and more requires less,' meaning that the product of the given numbers is transferred to the reverse side and vice versa. Thus, suppose that 10l has been lent me for 3 months, and I want to know how long I ought to lend a given sum (other than 10l.) in return; evidently the more I lend, the less the time for which I ought to lend it. If the sum be 10l., then 3 months is to the time a
A short time before the king's death, Sir Nicholas married the daughter of Sir Nicholas Carew, and on taking the king's advice to wife visit him at Coughton Court in 1580, he was received with coldness by the old knight; partly perhaps on account of his Protestant principles, but chiefly because he had been knighted before his eldest brother. To remove this cause of offence, he took his brother back with him to court, and at the request of Nicholas, the king raised him to the dignity of a knight.

Sir Nicholas Throcmorton was present when Edward VI died at Greenwich in 1553. He was aware of the designs of the partisans of Jane Grey, but cautious, he was too much attached to law and legitimacy to give the least sanction to them. He therefore came immediately to London, and despatched Mary's goldsmith to announce to her the king's death.

On the 2nd of February 1554, Sir Nicholas Throcmorton was arrested and committed to the Tower on a charge being concerned in the rebellion of Sir Thomas Wyatt. On the 17th of April he was brought to trial at Guildhall, London. This trial is the most important and interesting event in his life. A report of it, taken from Holinshed, is given in the "Library of Entertaining Knowledge—Criminal Trials." It is certain that he was acquainted with Wyatt's intentions, and there is little doubt that he was to some extent implicated in the rebellion. Before commissioners, some of whom were bitterly inimical to him, and who seemed to regard his trial as merely a form necessary to be gone through previous to his execution, Sir Nicholas held up his own defence; and this he did with such admirable skill, such promptness of reply and coolness of argument, intermixed with retorts, spirited, fearless, and reiterated, in answer to the partial remarks of the lord chief justice and other commissioners, and followed up by an impassioned address of appeal to the jury, that, in defiance of the threats of the chief justice and the attorney-general, he obtained a verdict of acquittal. Sir Nicholas was directed to be discharged, but was remanded, and kept in prison till the 15th June.

The jury were unhesitating in their verdict. Two were fined 2000l. each, six were fined 1000 marks each, and four, who expressed contrition, were not fined. All were remanded to prison, where they remained till the 12th of December, when five were discharged on payment of the reduced fine of 220l. each, three on payment of 60l. each, and four without fine.

Sir Nicholas Throcmorton, after his release, avoided the approaching storm of persecution by going to France, where he remained till 1556. Though he had served in Queen Mary's army under the Earl of Pembroke, he devoted himself chiefly to the princess Elizabeth, whom he visited privately at Hatfield. When Queen Mary died, he was admitted to her corpse, and, as Elizabeth had requested, took leave of her by refusing to take the oath of supremacy, and about 1558 was imprisoned in the Tower of London, where he remained several years.

Nicholas, who was Sir George's fourth son, was born about the year 1513. Having been appointed page to the Duke of Suffolk, the king's natural son, he accompanied his master to France, and remained in his service till the duke's death in 1538.

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Serv'd up in bail with sewer and sedanchair.

In 1544 he headed the English forces in the campaign against France which Henry VIII commanded in person; he attacked at the siege of Boulogne, and after his return received a pension from the king as a reward for his services.

After the king's death he attached himself to the queen's chamber, and in the Princess Elizabeth's minority, 1547 he distinguished himself in the campaign in Scotland under the Protector Somerset; he was present at the battle of Flodden (or Musselburgh), and Somerset sent him to London with the news of the victory. He was an afterwords created a knight, appointed to a place in the privy-chamber, and admitted to great intimacy with Edward VI. The king bestowed upon him some valuable manors, and made him under-treasurer of the Mint. He sat in parliament during Edward's reign as member for Northampton.
mind occasioned by the loss of her favour has been thought to have hastened his death, which took place at the house of the Earl of Leicester, Feb. 12, 1571, in his 59th year.

THROMBUS is a tumour formed by blood effused from a vein after bleeding, and coagulated in the adjacent cellular tissue. It is a kind of intense ecchymosis or bruise, and usually, if the vein not having been made exactly opposite that in the skin, so that some of the blood, instead of flowing out, is infiltrated between the vein and the surface. It is rarely of sufficient importance to require treatment, and is usually removed like the effused blood of an ordinary bruise. Sometimes however, inflammation ensues around the tumour, which should be treated by leeches and cold; or, if it proceed to suppuration, should be managed like a common abscess.

THROSTLE. 

THRUSH, or Aphthe, is a disease which commonly appears in the form of minute opaque-white vesicles scattered over the interior of the mouth and fauces. Vesicles or blisters of this kind often appear in a succession of crops, which were formerly called burstings, leaving tender and raw surfaces, while others are breaking out; and thus continuing through the whole course of some general disorder of the system.

The only variety of thrush in which the eruption is the most obvious sign of disease is that which is called milk-thrush, or aphtha infantum, or sometimes, in the supposition that it is the primary disease, idiopathic thrush. This however is almost always connected with disturbance of the digestive functions, and unusually frequent to some error of diet. It is most frequently observed in children that are brought up 'by hand;' and, in ordinary cases, requires only the means adapted to correct the disturbed digestion, such as small doses of magnesium and gentle purgatives. In very weakly children however, and in those that are ill fed and clothed, the surface of the mouth and fauces, exposed by the bursting of the vesicles, may slough or ulcerate; and this condition is always a sign of a deficiency of admixtures, tonics, nutritious food, and even powerful stimulants, such as wine or brandy. It is this form of thrush which is usually described as aphtha maligna.

In adults, thrush is a very common occurrence in the advent of many diseases, such as typhoid and other acute fevers, the hectic fever accompanying phthisis, diabetes, &c.; in short, in nearly all cases in which there is great prostration of strength, thrush may occur. In these cases, the only treatment that can be applied peculiarly to it is local. Great relief is often afforded by lightly sponging the affected surfaces with a solution of nitrate of silver, in the proportion of eight or ten grains to an ounce of water. Gargles, consisting of a draught of alum to a pint of water, or acidulated infusions of roses, or of one or two draffs of sub-borate of soda to half a pint of water, are often beneficial; and so is the milk borax of the Pharmacopoeia, when a small quantity of it is held for a few minutes in contact with the affected part.

THRUSHES. Under this name many ornithologists treat of the whole of the MERULIDAE, in which article the views of Mr. Vigors, Mr. Swainson, and the Prince of Mus—signifies the Prince of Canino, with regard to this family, are given.

Since the article Merulidae was written, Mr. G. R. Gray has published his List of the Genera of Birds, and we proceed to notice it before our readers his arrangement.

Mr. G. R. Gray makes the Turdus (Turdus, Linn.) the second family of his third tribe (Dentirostris) of his second order (Passeres). The Dentirostris are placed by him between the Tenuirostris and the Corinuris, and the Turdidae between the buccirostris and the Muscirostris.

The following are the subclasses and genera into which Mr. G. R. Gray divides the Turdidae—:

Sub. fam. 1. Formicarinae.


Sub. fam. 2. Turdinae.


Sub. fam. 3. Timaliinae.


Sub. 4. Oriolinae.


Sub. fam. 5. Pycnonithinae.


Mr. G. R. Gray, with his usual diligence and accuracy, gives the synonyms of all these genera; and observes, with regard to some of them, that Drosophila, Sw., has been used in botany; that Leptorhynchos, Menard., was previously employed; Petropolis, Sw., used in botany, or Euphlygia, Vied., used in entomology, only the termination a there in us; Cichla, Wagl., previously used in theological; Panurus, Hodgs., employed in hematology; and Micropsis, and Brachypus, Sw., previously used in other branches of natural history.

Some of these forms have already been noticed in this work, and we shall here confine ourselves to the true thrushes, or those so nearly allied to them, that, in common parlance, they are so termed.

EUROPEAN THRUSHES.

The following thrushes are European:—

Black Ouzel, or Blackbird, Merula vulgaris, Ray.; the Ring Ouzel, Merula torquata, Bris.; the Migratory Ouzel, Merula migratoria, Sw.; the Black-throated Thrush, Turdus atrogularis, Temm.; the Fieldfare, Turdus pilaris, Temm.; the Redwing, Turdus ilia, Temm.; the Missel Thrush, Turdus viscivorus, Linn.; the Song-Thrush, or Thrush, Turdus muscicola, Linn.; Cannabina, Thrush, Turdus unicolor, Temm.; the Polled Thrush, Turdus palidus, Pall.; White-throated Thrush, Turdus ilia, Temm.; the Siberian Thrush, Turdus Sibiricus, Pall.; the Water Ouzel, or Common Dipper, Cincia aquaticus, Bechst.; the Black-bellied Water-Ouzel, Cincia melanogaster, Breih.; Pallis’s Water Ouzel, Cincia Pallisii, Temm.; the Rock-Thrush, Petroliaea saxatilis, Vied.; and the Blue-Thrush, Petroliaea cyanus, Sw.

Of these, the Water Ouzel, or Common Dipper, is the Missel Thrush; White-throated Thrush (occasional only); the Ring Ouzel; the Fieldfare; the Redwing; the Blackbird; and the Ring Ouzel, or Ring Blackbird, in Britain.

We select as an example the sweetest songster among this tribe, in our opinion at least, and write it without reserve to the rich melodic quality of the blackbird, at the loud stirring notes of the missel thrush.

The Thrush or Song Thrush.

This well-known bird needs no description. It is the Greve and Petite Grise of the French; Torde, Turdu commune of the Spaniards; Ouezel, Torde in France; or Weiss-drossel, of the Germans; Mars, with the other names given, of the modern British; * and Advoe bronfbart of the ancient British.

Geographical Distribution.—Inhabits every country in Europe, haunting gardens and woods near streams or me-
The common garden-snail, *Helix hortensis*, is killed and eaten in great numbers by this species. The bird beats and breaks the shells against a stone to get at the animals. The nest is made of green moss generally, and fine root-fibres on the outside, and is lined within with cow-dung and decayed wood, the lining forming a cement, so perfectly spread that it will hold water. Eggs four or five, of a light blue, the larger end having a few small black specks or spots. Time of incubation thirteen days.

A first hatch generally comes forth in April, but the young have been known to be out at the end of March. There are generally two broods in the year. Both the cock and the hen sit, but the former less than the latter, often feeds her on the nest. A holly, a thick bush—a tall one is mostly preferred—a dense and somewhat high shrub or a fir, is usually selected; but the bird has been known to breed in an open shed or tool-house, and does not seem to shun the neighbourhood of man. In 1833 a pair built their nest in a low tree at the bottom of Gray Inn Gardens, near the gates where passengers are going by all day long. The hen laid her complement of eggs, and was sitting on them, when a cat climbed up and killed her on the nest. The cock immediately deserted the place.

Bechstein states that in captivity the Throstle is easily taught to perform airs. For taking it he recommends a perch with a limed twig as the best mode of capturing a fine-toned male: but in September or October he says that they may be caught in the water-fraps, where they repair by sunrise and sunset, so late that they sometimes cannot be seen, and the bird-catcher is only guided by his ear. He observes that, when the birds enter the water, there must be no haste on the part of the fowler, because they like to bathe in company, and assemble sometimes to the number of a dozen or more at once, by means of a peculiar call. Bechstein tells us that the first which finds a convenient stream, and wishes to go to it, cries in a tune of surprise or joy, 'sit, sir, then all the others in the neighbourhood immediately reply in concert and repair to the place.

The bath is entered however with a good deal of circumspection on their parts, and they seldom venture till they have seen a Red-breast bathe without danger. But the first that bathes is soon followed by others, and they begin to quarrel among themselves if the bath is not large enough to accommodate all satisfactorily. Bechstein further remarks that it is a good plan to have a tame bird running and fluttering on the banks of the stream, as a decoy to attract them.

### ASIATIC THRUSHES

#### Example, *Turdus erythrogaster*, male and female.

**Description.**—Male. — Front and top of head brownish-grey; occiput, upper aspect of neck, intercapillaries, scapulars, and shoulders deep yellowish-grey, faintly shaded with brown; back, rump, and upper tail-coverts dirty ash-grey. Under parts white, tinted in places ochre-yellow; sides of the neck, whole of the breast, flanks, and belly variegated with blackish-brown pyriform spots, one on each feather, the large end reaching nearly to its point. Sides of the head white, slightly tinted with ochre-yellow, variegated below the eyes with three blackish-brown bands; the foremost proceeds from the base of the lower mandible, the second from the middle of the under eyelid, and the third from the outer angle of the eye; the first extends nearly horizontally, and the two others obliquely downwards and backwards till they unite with the horizontal one. Primary wing-coverts and primary quill-feathers deep brownish-red, the latter tipped and edged externally with yellowish-white; the first two-thirds at least of the inner vanes of these feathers are of a clear buff-colour, darkest towards the shafts; secondary wing-coverts and secondary and tertiary quill-feathers dark greyish-brown, the outer vanes lightest, all margined externally and tipped with dirty white. Eyes reddish brown; upper mandible and tip of lower inferiorly as well as the claws liver-brown; lower mandible elsewhere, and the cutting edge of upper, pale saffron-yellow. Feet and sides of the bill deep straw-yellow.

**Figure.**—Robust and rather short. Bill long, and moderately strong; upper mandible broad and slightly depressed towards the base, narrow and distinctly notched near the tip; culmen between nostrils elevated and rounded, towards the point of the bill strongly curved; nasal fossae large and membranous, the nostrils narrow, longitudinal slits near to the edges of the mandible; wings short and rounded, and when folded they reach over the first half of the tail; the first quill-feather rudimentary, the third rather the longest; the second and fourth of equal length, and scarcely shorter than the third; the fifth a little shorter than the fourth, and the remaining primaries diminish in length successively. Tail short and slightly forked. Legs long, tarsi robust, anteriorly indistinctly scutellated, posteriorly entire; toes strong, the inner and outer toes of the same length; claws strong, much curved and pointed. Length from point of bill to tip of tail eight inches six lines.
Female differing but little in colour, if at all, from the male. (Smith.)

Locality, Habits, Food, &c.—Dr. Smith states that immediately upon reaching Kurichane, this thrush began to appear in the thickets, and he continued to acquire occasion-ally a specimen even in the vicinity of the tropic. It seeks, he says, its food upon the ground, and, when so occupied, its resort is readily discovered by the natives from the noise it makes in scratching the ground, or in displacing rubbish and decayed leaves which conceal the insects it is seeking. The name by which it is known in the country it inhabits is, he informs us, characteristic of the vigour with which it employs its feet, and the nearest translation he can give is 'Ground-Scraper.'

Dr. Smith further remarks that the form of its bill, particularly towards the base, the length of its legs, and the shortness of its tail, are all characters which remove it from the more typical species of the genus Turdus; but yet there is in its structure and habits what necessarily constitutes it a true thrush. (Illustrations of the Zoology of South Africa.)

Turdus strepilins, male. (Smith.)

AMERICAN THRUSHES.

Example, Turdus mystalinus, Gm.

Description.—Above, bright cinnamon brown, brightening into rufous on the head, and inclining to olive on the rump and tail. Beneath, whisth, thickly marked with pencil-shaped dusky spots. Vent pure white. Orb. bits of the eye white. Bill dusky brown, slightly notched, lower mandible flesh-coloured towards the base. Legs and claws very pale flesh-colour. Iris dark chocolate. Length 8 inches; alar extent 13 inches. (Nuttall.)

This appears to be the Turdus melodus of Wilson and Tuemy Thrush of Pennant, and is generally known as the Wood Thrush.

Locality, Habits, Food, &c.—Nuttall states that this solitary and retiring songster inhabits, during summer, the whole continent from Hudson's Bay to Florida, and, according to his friend Mr. Ware, breeds as far south as the vicinity of Natchez, in the State of Mississippi. He remarks that it is not satisfactorily ascertained whether the species quits the boundaries of the United States in winter, because the bird is then silent, and always difficult of access. He thinks it probable that this Thrush may winter in the Southern States, as a young bird, glean- ing insects and berries, had been caught in a garden in Boston on the 26th October.

But, wherever the Wood Thrush may winter, it arrives in the Middle States from the 1st to the 15th of April. Nuttall thus describes its song and habits:

'At the dawn of morning he announces his presence in the woods, and from the top of some tall tree, rising through the dark and shady forest, he pours out his few clear and harmonious notes in a pleasing reverie, as if inspired by the enthusiasm of renoveted nature. The prelude to this song resembles almost the double tam- ping of the flute, blended with a tinkling, shrill, and attrac- tive warble, which re-echoes from his solitary retreat, like the dirge of some woe and recluse who shuns the busy hum of life. The whole air consists usually of four parts or bars, which succeed, in deliberate time, and finally together in impressive and soothing harmony, becoming more mellow and sweet at every repetition. Rival per- formers seem to challenge each other from various parts of the wood, vying for the favour of their mates, with sympathetic responses and softer tones; and, some working a jealous strife, terminate the warm dispute by an appeal to combat and violence. Like the Robin and the Thrush, in dark and gloomy weather, when other birds are sheltered and silent, the clear notes of the Wood Thrush are heard through the dropping woods, from dawn to dark; so that, the saddler the day, the sweeter and more consist- ent is his song. His clear and interrupted whistle is likewise often nearly the only voice of melody heard by the traveller at mid-day, in the heat of summer, as he traverses the silent, dark, and wooded wilderness, remote from the haunts of men. It is nearly impossible by words to convey any idea of the peculiar warble of this vocal bird, but amongst his phrases the sound of 'a'riee,' peculiarly formed, and followed by a trill, repeated in two interrupted bars, is readily recognisable. At times their notes bear a consider- able resemblance to those of Wilson's Thrush, such as er rakes, er rakes, then varied to er rakes, er rakes, er rakes, then, er rakes, high and shrill. The Wood Thrush is always of a shy and retiring disposition, appearing alone, or only in single pairs, and, while he willingly charms us with his song, he is constant and even solicitous to remain concealed. His favourite haunts are low shady glens by watercourses, often rendered dark with alder-bushes, mantled with the trailing grape-vine. In quest of his insect prey he delights to follow the meanders of the rivulet, through whose leafy shad- ows the sunbeams glide quietly in a few inches over the sparkling surface of the running brook. So partial is his heart to solitude, that I have known one to sing almost uniformly in the same place, though nearly half a mile from his mate and nest. At times, indeed, he would venture a few faltering low notes in an oak near his nest, but his mellowest morning and evening warbles were always delivered from a tall lark's or from a thicket of hemlock, or in the new thick laurel or blooming alder, whose berries afford him an ample supply of food. Outwardly it presents a warm bed of withered branch or oak leaves, above these a layer of coarse old grass and leaf-stalks is laid, tempered with a mixture of mould and decayed wood smoothly plastered, so as to form a crust like the nest of the Robin. The whole is then surrounded by a thin lining of the black fibrous radicles of the fern.'
five in number, are scarcely distinguishable from those of the Robin, and of an uniform bright greenish blue destitute of spots. Beetles, caterpillars, and other insects, and in autumn berries, constitute the principal food of the species. Vuttall further states that the young remain for weeks around gardens in quest of berries, and that they are particularly fond of those of the various species of cornel and viburnum. At a season, he says, they occasionally leave their favourite glen and proceed to the adjacent woods, previous to their departure, sometimes venture to visit the rural suburbs of the city: The young, it appears, are easily reared, and, like our Thistle, sing nearly as well in captivity as in the wild. (Manual of the Botany of the United States and of Canada.)

THUANUS. [Thau., De.]

THUCYDIDES (θουκυδίδης), the son of Olorus, or Oro-
us, and Hegesiou, was a native of the demus of Alimus in Attica. He was connected by his mother's side with the family of the great Miltiades, and the name of his ather was a common one among the Thracian princes. He was forty years old at the commencement of the Pelo-
onnesian war, according to the statement of Paphia Messa, x. 29), he was born in n.c. 471. In his own reek he nowhere mentions his age or the time of his arth, but he says that he lived through the whole of the peloponnesian war, and that he was of the proper age for serving on the subject of his work. Thucydid mentions incidentally a few acts concerning himself, which is almost all that we know with certainty about his life.

There is a well-known story that when a boy he heard his father read his History at Olympia, and was so much moved that he burst into tears. But there is good reason or believing that this recitation of the History of Herodo-
was never took place at the Olympic games (Hesiodorus); but at a later date, for the story of Thucydius having heard him read it, we find rather the mention of a later recitation at Athens, which is mentioned by Phutarch and Eusebius. Suidae is the only writer who says that Thucydius heard Herodotus at Olympia; Marcellinus and Thoitus relate the same tale without mentioning where the recitation took place.

There seems nothing improbable in the accounts of the attent biographers that Thucydius was taught philosophy by Anaxagoras and rhetoric by Antiphon; but their statement that he accompanied Themistocles and Thurius is probably a mistake arising from their confound-
ing him with Herodotus, who, we know, was of the colo-
ists. But whether he went to Thuri or not, it is certain that he had charge of the History of the Pelopon-
nesian war, n.c. 459, whereas he was one of those who had the plague. (Thucyd., ii. 48.) In the eighth year of the war, n.c. 434, he was in command of an Athenian fleet of seven ships, which lay off Thasos. Brasidas, the Lacedemonian commander, made an attempt to possess of Amphi-
opolis on the Strymon, which then belonged to Athens; Thucydius, as soon as he heard of it, sailed to protect Amphipolis, but was only in sufficient time to save Eron, a report at the mouth of the Strymon. Amphipolis had been given to the Athenians by the Mohonian law, 450. Thucydius, in his treatise, n.c. 432, for this he was either condemned to death or banished by the Athenians in the year following, n.c. 433; and in con-
sequence of the sentence passed upon him he spent twenty years in exile, namely, till n.c. 403. (Thucyd., v. 26.) This period coincides exactly with the restoration of the democracy by Thrasylus, when a general amnesty was granted, of which Thucydius seems to have availed himself. Where is passed the time of his exile is not mentioned by him-
self, nor can any one pretend to now. Afterwards to Scapte-Hyle in Thrace, opposite the island of Thasos, where he had some valuable gold-mines. (Compare Plutarch, De Exilio, p. 605.) It appears however not im-
probable that he visited several places during his exile, for which he shows some knowledge of the history of the Italiotes and Sicelotes almost inclines one to suppose that he may have visited Italy and Sicily after he failure of the Athenian expedition in the latter island. His property in Thrace would however naturally lead him to pass the greater part of his time in that country. This property, which was very considerable (Thucyd., iv. 165), was probably derived from his family, which came from Thrace, though Marcellinus says that he obtained it by marrying a Thracian heiress.

How long he lived after his return from exile, and whether he continued at Athens till the time of his death, is quite uncertain. According to some accounts he was examined at Athens, n.c. 415, by Pericles, and Thasos, and his bones were carried to Athens. He is said to have been buried in the sepulchre of the family of Mil-
tides.

The Peloponnesian war forms the subject of the History of Thucydius. He tells us that he foresaw it would be the most important war that Greece had ever known, and that he therefore began collecting materials for its history from its very commencement; that, where he had to rely upon the testimony of others, he carefully weighed and examined the statements that were made him; and that he spared neither time nor trouble to arrive at the truth, and that in consequence of his exile he was enabled to obtain information from the Peloponnesians as well as from his own countrymen (i. 22; v. 26). Though he was engaged in collecting materials during the whole of the war, he does not appear to have reduced them into the form of a regular history till after his return from exile, since he alludes in many parts of it to the conclusion of the war (v. 18; v. 25, &c.). He did not however live to complete the eighth book ends abruptly in the middle of the year n.c. 411, seven years before the termination of the war. Even the eighth book itself does not seem to have received the final touches before its publication, although it may have been published in his lifetime; and there is therefore great prob-
ability that the statement is correct which attributes the publication of it to Xenophon. Niebuhr has brought for-
ward reasons to render it probable that Xenophons 'Hellessen' consists of two distinct works, and that the last five books were not published till long after the first two. The first two, which seem to have borne the title of the 'Paralipomena' of Thucydius, complete the history of the Peloponnesian war, and were not impro-
ably published by Xenophon, together with the eight books of Thucydius. (Niebuhr, in Phihloigical Museum, i. 486, &c.)

The first book of Thucydius is a kind of introduction to the history. He commences by observing that the Pelo-
onnesian war was more important than any that had been known before; and to prove this, he reviews the state of Greece from the earliest times down to the commencement of the war (c. 1-2). He then proceeds at the same time to the causes which led to it, of which the real one was the jealousy which the Peloponnesians entertained of the power of Athens; and interrupts his narrative to give an account of the rise and progress of the Athenian empire down to the commencement of the war (c. 89-118). He had an additional reason for making this digression, since this history had either been passed over by previous writers altogether, or had been treated briefly, without attention to chronology (c. 97). He resumes the thread of his nar-
ration, and indicates the several confederacies previous to the declaration of the war; but the demand of the Lacedemonians, that the Athenians should drive out the accused, which was answered by the Athenians requiring the Lacedemonians to do the same, leads to another digression respecting the treason and death of Pausanias (c. 128-134); and as proofs were found implicating Themistocles in the designs of the Spartan king, he continues the digression in order to give an ac-
count of the exile of Themistocles (Thucyd., c. 135-138). He then resumes the narrative, and concludes the book with the speech of Pericles which induced the Athenians to refuse compliance with the demands of the Peloponnesians. His history of the Peloponnesian war, does not terminate with the second book; but it would be out of place to give here an abstract of the remainder of the work.

Thucydius had formed a high opinion of the value and importance of the work he had undertaken. It was not his object to afford amusement, like former writers, but to
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give such a faithful representation of the past as would serve as a guide for the future (l. 22). His observation of facts was profound; his presentation of arguments was extraordinary clear-sightedness into the motives and policy of the leading actors of the war; and he draws from the events he relates those lessons of political wisdom which have always made his work a favourite study with thoughtful men. His style is free from all affectation; he has no ideological bias, and can trace it back to the K.a.k. or Purdah, where we find them described with the utmost accuracy. But before we proceed to investigate their secret history, of which we have only a slight and unsatisfactory knowledge, it is necessary that we should give them the time of their discovery. Their gangs, consisting of tradi
ten to two or three hundred men of all races, castes, sects, and religions, yet all joining in the worship of K.a.k., moved about all parts of India, sacrificing to their tutelary gods, and carrying on a trade of banditti and pirates among themselves. Still they shed no blood, except where
duced by circumstances; murder being their religion.
their performance of its duties required secrecy, and the instan-
tance of death was a rule or a moderation where there was
no premeditated crime. They were stranglers. Every gang
had its leader, the Jemadar or Sirdar; its teacher, the
Guru, whose duty it was to initiate the novice into the
secret of using the roomal, or handkerchief. Thus came
to pass that the Hindoos had adopted their custom from
the Persians, and had transmitted it to the Mohammedans, which border the roads afforded the Lughanes every facility
for effectually concealing the bodies; and the prevailing
custom of travelling in parties prevented the discovery of
the Sotha from being suspected, whenever he succeeded
in offering the protection of his Jemadar to travellers whose
wealth induced him to entrap. The Thugs generally
assume the appearance of merchants, which increases the
certainty of their victims' confidence in them. They
are of the greatest social and political influence in certain
regions of the country, and the relation of the Thugs to
the villages and other public authorities is not well known.
While the Thug expresses himself in a manner calculated
to impress the minds of the average Indian, the Thug
employs various devices to dissimulate his true character.

THU (from Hindustans <hāguna, to deceive) means a
deceiver, and is the special appellation of secret murderers
employed by the Thugs to carry out their bloody
ventures. Their object was to deceive the public
shame the government to root out. Of their origin nothing
can be said with any degree of certainty. The Thugs thre-
selves refer it to the remotest antiquity, and there is no
doubt that the ceremonies with which they carry on their
business can be traced back to the ancient castes of the
K.a.k. or Purdah, where we find them described with the utmost
accuracy. But before we proceed to investigate their secret
history, of which we have only a slight and unsatisfactory
knowledge, it is necessary that we should give them the time of

..
The origin of this atrocious worship is undoubtedly Hindu. The Thugs maintain that their occupation is represented in the caves of Ellora, as well as all other trades. But the facts and traditions they use are chiefly of Sanscrit origin; and the worship of Kālī corresponds so well to the religious ceremonies of the Thugs, that there can be no doubt as to their identity. To satisfy the reader on this head we refer to the 6th volume of the Asiatic Researches. One of the most curious accounts of these caitkis are those written by the Kālī Purāna which has been translated and communicated by Mr. Blaquière. All the ceremonies of the Thugs are fixed by this Purāna, the date of which is difficult to ascertain, but, from the fact that it is the basis of the Tānta drama of Bhāshabhūti, who lived at the court of king Bhoja in the beginning of the eighth century of our era, we have sufficient reason to refer to it at least to his time, if not to a previous period.

The Thugs then are a degenerate sect of Kālī worshippers. They are very numerous in Bengal; but they offer only buffaloes and kids (Colebrook, 'Essays,' i. 111), and shed their blood, which they present to the idol in cups that are kept for that purpose. In like manner as the Saktas left the pure worship of Sīva in order to indulge their gross sensuality, the Thugs abandoned the original worship of Kālī to get a livelihood by plunder. Both nevertheless adhere strictly to the injunctions of their religion, and are in the same manner devoted to the service of Kālī, which is their goddess, in the tradition of the Thugs, and thereby convert crime into a sacred duty. As well may be expected, secrecy was dictated by prudence, and hence it is that we find the Thugs seldom mentioned by travellers.

The first of which we shall mention (p. 22), is the first to notice them; he describes them as infesting the road from Agra to Delhi, and using a long rope furnished with a noose, which they throw with great dexterity round the traveller's neck, and he relates that their Sothas were frequently women. About 20 years after Grégoire Dr. F. Frer found them at Surat, where a gang of them were executed. He describes them as Thénets do, and it appears from the description that they belonged to the Mooltanais, or Thugs, who lived in the neighbourhood of Kālī Purāna. Thugs are a sect which has been at the same time so much talked of and derided. Although the whole of the ceremonial is Hindu, the Thugs themselves, whether Hindu or Mohammedan, maintain that they descend from seven Mohammedan clans, Thugs, Bhys, Bursrote, Kachunee, Huttar, Ganoo, and Thundee (Ramaseena, p. 11); the seven clans are admitted to be the most antient and the original stock on which all the others have been engraven. This circumstance may lead us to suspect that Mohammedans were indeed the first to give a sort of political system to the Thugs; but with the approach of the age of chivalry they were murdered as dreadful as that of the Thugs, may, when persecuted in the last days of their political existence, have joined themselves to the Hindu Pāñgārs, and, adopting their ritual, have become Thugs. This point is investigated with much ingenuity in an article on the 'Secret Societies of Asia,' in the 49th vol. of 'Blackwood's Magazine' (part civ.). Shah Jehan and Aurengzebe instituted criminal proceedings against them. After this we again lose sight of them until the time of Hyder Ali, who proceeded against them in a summary way. Mysore however seems to have been their favourite residence; for in order to suppress them, in the reign of Tippero Sultan, many of them were apprehended and sentenced to have their ears cut off. Mysore also that the English government first discovered them soon after 1799; but it was not before 1810 that any measures were taken for their extermination: and a plan for the suppression, which promises success, was adopted in 1830 by the then governor-general, Lord William Bentinck. Since that time their numbers have rapidly diminished, and it is to be hoped that they will soon be totally extinct.

The name of a genus of plants belonging to the natural order Coniferae. This name is derived from āravī, as, on account of the pleasant odour given out by the wood in burning, it was used in ancient sacrifices. The species of the genus are more commonly known by the name of Arbor Vitae, but why this name has been given to it is a matter of uncertainty. Clusius, who wrote in the sixteenth century, gives it this name, and Dr. Royle says that the Cypress, an allied genus, is called the linden in the East. It belongs to the section of Coniferae called Cupressine by Richard, in which Cupressus, Callitris, Taxodium, and Juniperus are also included. The pistils and stamens are in separate flowers on the same tree. The female catkins are round and solitary; the pollen of each flower is included in four cases that are attached to the inner face of the scale towards its base. The female catkin is terminal; the ovary is united to the bracteal, form a tube, and from the receptacle of these two ovules; the receptacles are sericeolate, imbricated, and smooth; or, in some cases, have a recurved beak near the tip; the seeds in some are slightly winged. The leaves are scale-like, closely imbricated or compressed. The species are evergreen, either trees or shrubs, and are inhabitants of Asia, Africa, and North America.

_T. occidentalis_, the Western or American Arbor Vitae, has the branchlets 2-edged; the leaves imbricated in four rows, ovato-robiboeld, adpressed, and tuberculated; the cones are obovate with the interior scales truncate and gibbose beneath the apex. This plant is a large shrub or small tree, and is a native of North America, from Canada to the mountains of Virginia and the Carolinas. It is not so commonly遇见 as _T. orientalis_, which forms steep banks of mountain-torrents. In the Northern states of America it is sometimes called the white cedar, but more commonly arbor vitae. It grows best in cool moist places, on the borders of rivers and lakes, and in swamps, and is at home also to the extreme climes of Europe. The stem of this tree seldom rises straight from the ground, but makes a short bend before it becomes straight. On this account it is difficult to obtain trunks of any length, and, although the timber is very durable, it is not much used in building. It makes good spars of considerable size, having three or four times as long as any other species. Its branchlets are used for making brooms, a recommendation of which is, that they exhale an agreeable odour. In Great Britain the American arboretum is planted and cultivated for which purpose it flourishes best in low moist and sheltered situations. It will bear cutting well, and hence is employed for making hedges. It grows slowly, making 6 or 8 inches of stem in a year; the largest specimens in this country have attained a height of from 30 to 45 feet.

_T. orientalis_, the Oriental or Chinese Arbor Vitae, has 2-edged branchlets; imbricated, ovato-robiboeld, adpressed leaves, furrowed in the middle and in 4 rows; the cones are elliptic with the interior scales blunt, and mucronate at the base. It is a native of China and Japan, and is distributed through Siberia and China, and on the mountains of Japan. It is a low tree and easily distinguishable from the American species by its denser foliage and lighter green colour. It is a native of Tartary, and is an elegant shrub, but only a few specimens exist at present in this country.

_T. articulata_, a genus of plants, is a species commonly called Callitris quadrivalvis, four-valved Callitris. The genus Callitris differs from Thuja in having the scales of the female catkins from 4 to 6 in number, opening like the valves of a regular pericarp, and the seeds at the base of these scales winged on the margin. The four-valved Callitris has flattened articulated leaves; the female catkin with four oval pointed valves, two of which have seeds. It is a native of Barbary, and attains a height of from 15 to 20 feet. It was first discovered by Desfontaines in 1796. The gum-sandarac of commerce (Santarac), according to Brousseent, Bromniart, and others, is the produce of this tree, although it is often ascribed to the Cupressus communis. This substance is much in demand, and is found on market in tears, which are clear, shining, and diaphanous, and of whitish-yellow colour. When reduced to a fine powder, it makes an excellent pounce. Dissolved in spirits of wine, it forms a delicate varnish. Under the name of alerce, the wood of this tree is in great request in
the East for building religious edifices. Captain S. E. Cook ascertained that the roof of the celebrated mosque, now the cathedral of Cordova, which was built in the ninth century, is constructed of the wood of the alerce. It appeared to be a slow-growing tree, and would probably grow well in this climate in the open air.

(Loudon, Arboretum et Fruticetum Britannicum; Lindley, Natural System; Burnett's Outlines of Botany.)

The VÄN of the Bois-le-Duc, in 1607, was one of the most distinguished scholars and assistants of Rubens, with whom he was also a favourite. He was with Rubens in Paris, and is said to have executed the greater part of the celebrated series of the so-called "Grandes Cartouches" in the room of the Medici. Van Thulden is distinguished both as a painter and as an etcher. As a painter he excelled in various styles. There are several large pictures, both historical and allegorical, by him, dispersed over Germany and the Netherlands; he painted also small pictures of country life in the manner of Teniers, such as markets, fairs, and the like; and he was frequently employed by architectural and landscape painters to embellish their pictures with small appropriate figures, which he was used to paint, in the pictures of Neefs and Steenwyck.

Van Thulden's style in his greater works is altogether that of Rubens, and, although inferior in boldness of design and colouring, his works may easily be mistaken for those of the Martyrdom of St. Andrew, in St. Michael's church at Ghent, which long was thought to be a work of Rubens. In chiaroscuro, Van Thulden was quite equal to his master. A St. Sebastian, in the church of the Bernardines at Mechlin, and an Assumption of the Virgin, in the Church of St. Lambert at Bruges, are generally considered as his best altar-pieces. While at Paris he painted twenty-four pictures of the Life of St. John of Matha in the church of the Mathurins, which he himself etched on copper in 1633; the pictures have since been painted over. Van Thulden's etchings are of a masterly style; he published a set of 58 plates from the paintings of Nicolas Abati at Fontainebleau, after the designs of Primaticcio, which are greatly valued, for as the paintings were destroyed they are all that remain of the original designs. They have been copied several times. The original set appeared under the following title: Le Travaux d'Ulysse, d'esegnezier par le Sieur de Saint-Martin, de la façon qu'ils se voient dans la Maison Royale de Fontainebleau, peint par le Sieur Nicolas, et gravés au cuivre, par Theodore Van Thulden, avec le sujet l'explication morale de chaque figure. He etched also 42 plates after Rubens, of the entrance of Ferdinand the Cardinal-Infant into Antwerp: "Pompa introitus Ferdinandi," &c. The etchings of the History of the Princes of Orange, to which Van Rubens' name, are now said to be from his own designs; they are entitled, De verlooren Soen, door P. F. Rubens. Th. Van Thulden fecit. Van Thulden died in his native place, 1676.

(Descriptive, La Vie des Peintres Flamands, &c.; Fussia, Allgemeines Kunstler Lexicon.)

THULITE, a mineral, the texture of which is usually granular. Lustre vitreous. Translucent on the edges. Hardness between 5 and 6; but the grains separate easily that it is rather difficult to determine its Colour [illegible]; streak greyish-white. Specific gravity 3.1055. Below the blowpipe fuses with carbonate of soda into a greenish-white bead; with borax forms a colourless transparent bead; the addition of water melts the latter. It has been found in Norway; and, according to Gmelin, consists of silica, 42-808; alumina, 31-144; lime, 18-726; soda and a trace of potash, 1-891; oxide of iron, 2-898; oxide of manganese, 1-633; water, 0-640; total, 99-732.

THÜMMLER, AUGUST, a German writer who was greatly admired by his contemporaries, and who still continues to hold a high literary rank with his own countrymen. He was born at Schönfeld, near Leipzig, May 27th, 1738, where his father possessed considerable property, but lost much of it by the plunder of the Prussian troops in Saxony, 1745. Moritz, who was the second son of a family of nineteen, was sent to the university of Leipzig in 1756. There he found in Gellert not only an instructor, but a friend; and he also formed an acquaintance with Weise, Rabener, von Kleist, &c., and, among others, with an old advocate named Balz, who at his death, in 1776, left him the whole of his fortune, twenty-four thousand dollars. This accension of wealth enabled Moritz to give up the places he held under Der Ernst of Saxo-Coburg, first as kammer-junker, and, from 1783, as the duke's private secretary. He died at Sonneborn, an estate of his wife, at which place and at Gotha he continued chiefly to reside until his death, which he saw while on a visit to Coburg, October 26th, 1817. Thümmel's literary reputation was established by his "Travels in the Southern Provinces of France," first published in 1764. This short production, for it is in only five cantos or chapters, was received as something altogether new in German literature, and as a masterpiece of polished humour and playful satire. It was translated into English, French, and Italian, in the year of its publication, and has been reprinted entirely in Wolff's "Encyclopädie," 1842. His poetical tale, Die Inkorporation der Liebe, 1771, and other pieces in verse, did not add much to his fame; but his last and longest work, Reise in den Mittelatlantischen Inseln von Frankreich, travels in the Southern Provinces of France, in 9 vols., 1799-1800, is also his literary chef-d'oeuvre. Instead of being, as its title would import, the mere record of his tours in that country, it is, like his "Sentimental Journey," to a great extent, a work of fiction, interspersed with episodes which breathe more of poetry than his other productions of that kind. It abounds with satiric humour and pleasantry, with witty and shrewd observations, and shows the author to have been a shrewd observer, and is so intimately acquainted with human nature, that it a work of no ordinary merit and pretension may be supposed from the notice it has obtained from Schiller, in his essay "Ueber Naive und Sentimentalische Dichtung," who, if he had not been a writer, might be considered as that, as a work of amusement, it is one of a superior kind, and will as such continue to enjoy the character it has obtained. A portrait of Thümmel, after Oecser, is prefixed to the 6th volume of the "Neue Bibliothek der Gelehrten Kunst," a complete edition of his works in six volumes.

(Jünder's Lexicon; Schiller's Kleinere Prosaische Schriften; Wachler's Vorlesungen.)

THUN, a town in the canton of Bern in Switzerland, situated about a mile below the banks of the river Aare, at the foot of a hill, on which is built the castle, the keep of which was, in the middle ages, the residence of the counts of Thun. On the opposite or southeastern side are seen the Alps of the Oberland, covered with perpetual snow. The parish church, with its lofty tower, is a remarkable building. There are also a handsome town-house and two parochial schools, besides a military library of 7000 volumes, and a military school for the artillery and engineer corps of the federal service. [Switzerland.] The population of Thun amounted, by the last census, to 4833 inhabitants. (Leresche, Dictionnaire Geographique de la Suisse, 1836.)

The lake of Thun, Thuneree in German, is 14 miles long from south-east to north-west, about three miles in its greatest width, and about 700 feet deep. Its surface is 6000 feet above the sea. The Aar, coming from the lake of Brienz, enters it at its south-west end, and issues from it at the opposite extremity. The Kander, swelled by the Simmen, also enters the lake from the south. The lake abounds with fish; and its banks, planted with vineyards, where the wine becomes abruptly to steep mountains, afford a variety of scenery. A stone arch spans the lake.

THUNBERG, CARL PETER, an eminent Swedish traveller and botanist, and professor of natural history at Upsal, was born at Upsal, November 1743, at Jönköping in Sweden, where his father was a clergyman. He was early sent to the university of Upsal for the purpose of studying medicine, and became a pupil of the great Linnaeus. Under his instruction he was enabled to attain for natural history which has distinguished the school of Linnaeus, and which has given to the world so many famous naturalists. Having completed his course of study, he graduated in 1760, and, having bestowed upon him the Karlsberg pension for the space of three years. Although it was small, about fifteen pounds per annum, he determined to use it for the purposes of improvement, and accordingly,
left Upsal for the purpose of visiting Paris and the universities of Holland. Whilst in Amsterdam, he became acquainted with the botanists and florists of that city, and, they suggested to him the desirability of some person visiting Japan for the purpose of exploring its vegetable treasures. This suggestion, which he ventured to a situation as surgeon to one of the Dutch East India Company's vessels having been obtained for him, left Amsterdam for Japan in the year 1771. He landed at the Cape of Good Hope for the purpose of learning among the Dutch settlers there. This was the only European language spoken extensively in Japan, and also in the hope of adding to his knowledge of natural objects by researches in Africa. Here he made several excursions. Although he gradually recovered his health, and after having resided at the Cape three winters, where he collected much valuable information, he set sail in 1773 for Java and the Japan Isles. He remained in these islands five years, making large collections of the plants of these countries, as well as observations on the habits, manners, and language of their inhabitants. His ability to labour, however, during his residence both in Africa and Asia, was very much diminished by a frightful accident which he met with on first leaving Holland. The keeper of the Linnean Society, having given out white lead instead of flour, it was mixed with flour and used for making pancakes, of which the whole crew partook. All were ill, and many suffered very severely at the time, but not Mr. Thunberg. He gradually recovered his health, and through his long life always laboured under the debility and derangement his system had thus received. He returned to his native country in 1779, making first a short stay in England.

During his absence he had been elected a member of the Linnean Society, 1774-1790; being, an election in 1777, and in 1784 was installed in the chair of the great Linnaeus as professor of botany. In 1785 he was made a knight of the order of Wasa, and in 1815 commander of the same order.

At his home, Thunberg immediately commenced arranging the vast mass of materials he had collected in his travels for the purpose of publication. His first important work was a description of the Japanese plants, which was published at Leipzig in 1784, with the title Flora Japonica, Plantarum Insulae Japonicae, secundum Systema Sexuale emendatum,8vo., and illustrated with thirty-nine engravings. In this work a great number of new plants were described and arranged according to the three classes of Monocotyledon, Dicotyledon, and Polygrama. He subsequently published some botanical observations on this Flora, in the second volume of the Transactions of the Linnean Society.

It has been translated into German by Groskund, and published at Berlin in 1792. It appeared in English at London in 1793, and in French at Paris in 1796. His next work was a Promotus Plantarum Capenacian, Anni 1772-1774, collected Upsal, 1784-1800, being an account of the plants he had collected at the Cape. From 1794 to 1805 he published in folio, under the title Icones Plantarum Japonicae, Upsalia, a series of plates illustrative of the botany of the Japan Isles. These were followed by the Flora Capensis, Upsalia, 1807-13, 8vo. In this work is the most complete view of the botany of the Cape of Good Hope is given that has hitherto been published. In 1807, in conjunction with Billberg, he published the Plantarum Brasiliensium Deca Prima, Upsalia, 4to. In this work the plants collected by Freire and Sauerlander, in the province of Minas Geraes in Brazil, are described, but the subsequent parts were published by other hands.

Besides the above works, on which the reputation of Thunberg as a traveller and a botanist mainly rests, he was the author of a large number of dissertations. The subjects of these were chiefly those which his long residence in Africa and Asia afforded. The majority of them are upon botanical topics, but a few are devoted to a consideration of zoological subjects. Although he was, on his travels, he yet lost no opportunity of obtaining a knowledge of the new animals he met with, and several of his papers are descriptions of these. He published several memoirs in the London Philosophical Transactions, and the Transactions of the Linnean Society, also in the Transactions of Russian, German, French, and Dutch scientific Societies and Journals, and a much greater number in those of Sweden. The academical dissertations bearing his name, and presented at the university of Upsal, are numbered only one hundred, and were published between the years 1789 and 1813.

Thunberg was elected an honorary member of sixty-six learned societies. He died at the advanced age of eighty-six, on the 9th of March, 1828.

Retzius named a genus of plants in the natural order Acanthaceae, in honour of him, Thunbergia. The following genera of plants have species named after him:—Ixia, Isolena, Cupera, Imperata, Spatula, Convolvulus, Batrachium, Isolepis, Isolepis, Carex, Calamus, Carya, Serbica, Erica, Passerina, Thalictrum, Coccus, Equisetum, Hypnum, Fissidens, Cystoseira, Gyalecta, and Endocarpon. Of insects, the genera Harpaphe, Lygaeus, Fyllus, and Trinca have specific names after Thunberg.

His work as a rural physiologist, nor did he attempt anything more in systematic botany than a slight emendation of the system of Linneas. In this he was followed by very few; and those who at the present day have recourse to that system for arranging plants, generally adopt the primitive plan of Linneas. As a traveller, Thunberg is remarkable for the accuracy of his observations on the manners, habits, and domestic economy of the people that he visited.


THUNDER is an explosion accompanied by a loud noise, which is heard after a discharge of lightning from the clouds. The character of the noise is various, but it sometimes resembles that which is produced when a single piece of ordnance is fired; at other times it is a rolling sound like the successive discharges of several guns; and occasionally it may be compared to a series of sharp reports from a fire engine.

The identity of lightning with the electric fluid is now well known [Lightning], but the physical cause of the detonation which accompanies the flash is still the subject of conjecture; in general it is considered that lightning, by its heat, creates a partial vacuum in the air, and that the sudden rushing of air into the void space produces the sound; but various reasons have been assigned for its prolongation. It was formerly supposed that the rolling noise is merely the result of several echos produced by the reflection of the noise from trees, woods, buildings, or clouds, or from the latter alone when a thunder-storm takes place over the ocean: this opinion seems to have been founded upon the fact that the report of a fire-arm discharged in a mountain may be heard by the echoes during at least half a minute, which is about the time that the rolling of thunder continues. But though the reflections of sound are, very probably, in part, or at times, the causes of the prolongation of the report arising from the explosion, yet it must be admitted that these will not always afford a satisfactory explanation of the phænomena. It may happen, for example, that, when the sky is
uniformly covered with clouds, a flash of lightning will dart from the zenith, and, after a few seconds, the crash of thunder will take place accompanied by a rolling sound:

soon, a second flash may pierce the clouds in the zenith and thunder may follow, and now the claps, though loud, may not be heard. It is justly observed by M. Arago that this is very different from the phenomena of echoes; and the explanation which was first proposed by Dr. Hooke ('Posthumous Works, 1705) is perhaps that phenomenon of propagation of a flash of lightning, Dr. Hooke observes, are either simple or multiple:

the first occupies but one small portion of space, and gives rise to an instantaneous report; the multiple flash takes place at different parts of one long line: if these parts should be of equal length (or circular arc), and if there be in its centre, all the reports would arrive at his ear at the same time, and still one loud crash only would be heard; but if the parts were nearly in a straight line, and the observer were at one of its extremities, the reports, whether they take place at the same instant or in succession, would arrive at his ear at different times, depending wholly or partly on the distances. It may be considered therefore that the rolling arises from the circumstance that these lines of vision are at different distances from the observer; and it will follow that the duration of the noise is equal to the time in which sound travels through an interval equal to the difference between the lengths of two lines drawn from the observer to the two extremities of the line of light. The duration of this thing seems to be very short, compared with the time of the report of the thunder take place in reality at the same moment; but since sound travels at the rate of 1100 feet per second, while the passage of light from the cloud to the observer may be considered as instantaneous, it follows that the number of flashes which may pass between the time of seeing the flash and hearing the report, the distance of the thunder-cloud from the observer may be ascertained if 1100 feet be multiplied by that number.

The experiments of Lavoisier and La Place have shown that the molecules of water, in evaporating, convey away from the earth a portion of the electricity which it contains, and which the water has acquired in being converted into vapour. This electricity becomes diffused in the upper regions of the atmosphere, and, when the vapours again become condensed so as to form globules of water, the electricity disperses itself on the surface of the globules in different quantities according to their magnitudes. When these quantities are equal, it will happen, that the quantity of electricity passing between the time of seeing the flash and the report, the distance of the thunder-cloud from the observer may be ascertained if 1100 feet be multiplied by that number.

An opinion prevails that thunder has been heard when the sky was without a cloud, but the fact can scarcely be said to be satisfactorily established; for the sounds which, in countries subject to earthquakes, have been supposed to be heard from under the sea, and may have been produced from different cause. Volney however relates that, being one day at Pontchartrain near Versailles, when no cloud was visible, he heard distinctly four or five claps of thunder: he adds that about an hour afterwards the sky became overcast, and a violent hail-storm followed. On this relation M. Arago observes that the sounds could not have been heard if they had come from clouds at a greater distance than six leagues; and if the clouds had been at, or a little within, that distance, they must have been visible, unless it be supposed that the sound were not made to pass to the ground: but the hail which followed the thunder must have proceeded from clouds having great elevation, though at the time the claps were heard they were too remote to do so; and therefore he concludes that the sounds must have been produced in the air itself. For an account of death caused by electricity in the air when the thunder-cloud was very distant, and for the theory of the returning stroke, see the Philosophical Transactions, vol. lxxvii.; and Stanhope, Charles, E.A.

From the meteorological observations made by Dr. Servy, and Captains Phripps, Parry, and Ross, it appears the thunder nor lightning is known to take place beyond the 75th degree of latitude: even so low as the 70th degree those phenomena are very rare; and in the tables of Captain Parry's the occurrence of thunder and lightning is mentioned but once since June, 1825, an instance which may be considered as an exception. If heard thunder on one day only between September, 1825 and August, 1826.

THUNDER-ROD, a bar of metal attached generally to a side of a building, and extending a flash of lightning from above the highest part of the roof, or of the steeple, if the building have one. In order to secure the edifice from the effects of thunder lighting: the upper extremity of the rod or bar terminates in a point.

When a thunder-cloud passes above an elevated object it produces in the nearest part of the object the kind of electricity which is opposite to that of the cloud itself, so that a rapid and abundant communication takes place between them, and thus their electric property is diminished. The lightning is a compulsion of the fluid in the earth, or that of the earth rushes towards the cloud: and the materials of the building are not good conductors of electricity, the fluid, in its passage exerts an explosive action by which the building is destroyed or greatly injured. The tendency of the fluid to seek a low sub stance, serves to convey the fluid harmlessly to the earth or air. When it has happened that there is an interruption of the communication, by the rod being broken or even by being much diminished in magnitude by condensation, a part of the fluid has been compelled to pass between the parts of the rod above and below its place of fracture.

Buffon, and Dalibard, at his suggestion 1752, appr. have been the first persons to reduce the atmosphere by means of pointed rods of metal; and in the following year M. de Romas elevated a paper kite to the height of 550 feet for the like purpose: this was above twelve months before Dr. Franklin, without any knowledge of what had been done in Europe, performed an like experiment in America. The object of the French philosophers was merely to obtain by those means, electrical sparks or flashes of fire; but it is to Dr. Franklin that the world is indebted for the idea of making parallel rods of iron or iron coated with copper, and for the employment of the spherical electricity; and the recommendation was immediately adopted both for edifices on land and ships on the water.

Soon after the first employment of thunder-rods in Europe, an opinion prevailed that when their extremities were pointed they created a danger which did not exist before, and that they attracted lightnings which would, without the rods, have discharged themselves at a distance; at Turin, a metallic rod bent near the top and terminated by knobs of metal, the notion was entertained by the Abbé Nollet, in France but in the Royal Society of London the question concerning the relative efficacies of pointed and knobbed conductors was agitated with great vehemence, chiefly through the obstinacy of Mr. Wilson, one of the Fellows, who, in 1778, made himself the head of a party in support of the latter kind of conductors, in opposition to the president [Parnell, John]. It is remarkable that both George L. Abbe Nollet, in December of the year 1733, gave the preference to balls over points, and the other while he consented to have conductors raised on his towers and powder-magnets, proposed the erection of them on his palace of Sans Souci. It is now understood that the prejudice against pointed thunder-rods was entirely without foundation: those conductors have been found not only to protect buildings when struck, but also to chasm thunder-nod, from the few yards which are sometimes experienced. An experiment which was made by Becquet in 1753, might have shown the superiority of pointed conductors over those with balls; for that distinguished electrician set up on the roof of the church of San Giovanni, at Turin, a metallic rod bent near the top and terminated by a point: the upper part was capable of being turned round by means of a silk line, so that the point could be
directed upwards or downwards at pleasure, and the lower part of the rod terminated upon substances which were imperfect conductors of electricity. On directing the point towards the sky when a thunder-cloud passed over the church, electrical sparks issued in abundance from the foot of the rod; but when the point of the rod was reversed, there were few or none obtained. The conducting-rod set up by Prof. Priestley, at St. Petersburg, may be said to have been the cause of his death (1753); but the house would most probably have been struck if there had been no conductor. The iron point on the top of the rod led into the apartment, and the unfortunate Professor was standing too near its lower extremity. (Phil. Trans., vol. xlviii.)

Some doubt however still exists concerning the distance from which the protecting influence of the rod extends, but it is generally supposed that this influence is limited by the circumference of a circle described about the rod with a radius equal to double its height above the top of the building.

When the magazine at Purfleet was struck by lightning in 1777, the shock took place on an iron cramp which united two stones of the cornice, at the distance of 24 feet from the thunder-rod, measured horizontally; and the upper part of the rod was raised a foot above the top of the roof on which it was erected. Again, in 1781, the workhouse at Heckingham in Norfolk, though provided with eight rods, was struck by lightning at a spot which was distant 55 feet measured horizontally from the nearest rod. The conductive matter was blown upwards, and the height of the point terminated at the top of the building, so that it may be inferred that large buildings ought to be protected by several rods and that the less these are elevated the greater ought to be their number; also that no point of the building ought to be at a greater horizontal distance from the nearest rod than twice the height of the rod above the top of the building. Mr. Cavendish, Dr. Priestley, and many others who have had the misfortune to become conductors of electricity have been either struck themselves or have been struck by objects which were situated in the line of its first direction. In the expectation of being able to attract the lightning entirely away from powder-magazines, or any building containing inflammable substances, it has been proposed to have masts at the distance of a few yards from the building: this practice has many advocates, and the only objection to it is, that it is attended with considerable expense.

Many lofty buildings contain in their construction the means of securing them from excessive lightning, and such is the case with the Monument on Fish-Street Hill; this building, whose height is more than 200 feet, is crowned with a metallic ball surrounded by bands which are joined by horizontal iron bars, and descend four bars of iron which serve to support a flight of steps, of the same metal, and one of them is in connection with the iron railing which extends from the balcony to the ground. In 1764 lightning struck the steeple of St. Bride's Church in Fleet Street, and descended from thence along an iron bar about 20 feet in length and two inches in breadth, which was almost buried in the stones: the electric fluid left no traces of its passage along this bar, but at the place where the metal terminated the damage was considerable. The building was struck by lightning near a cast-iron parapet, and a considerable distance. A similar accident has this summer (1842) occurred to the church of St. Martin in Westminster.

A ship at sea, like an edifice on land, may, when there is a static accumulation of electricity, which may be produced in the atmosphere, be struck aloft; or, when the atmosphere is in a contrary state, the lower part of the ship may be struck, the lightning in the latter case ascending along the mast: and ships unfurnished with metallic conductors have frequently suffered serious injury during thunderstorms, while those which have been so provided have generally escaped. When Captain Cook was at Batavia, lightning fell on the ship with such force that the shock resembled an earthquake; the conductor, which was very slender, appeared to be on fire from the mast-head to the sea, yet no damage was done to the ship. In 1814, while a great storm raged at Plymouth, of all the ships then in port only one was struck by lightning, and this alone was injured. Another ship, that of the late Mr. Fielding, was struck on the 2nd of July 1834, when there were three violent flashes struck the ship Etna, which had conductors, without doing any injury, while two ships not far distant, being destitute of such protection, were much damaged.

The rigid bars of Franklin are considered inapplicable, as conductors, because they attract the lightning to the mast-head, and copper have been generally employed; these are attached to the masts at their upper extremities; and, following the standing rigging, they pass down the ship's sides into the water. Objections have been made to the conductors of electricity, their liability to be injured or broken during storms; and copper links attached to the masts by flexible spiral wires were suggested by Mr. Singer. M. le Roy also recommended a chain of copper rings which were to encircle the main-topmast backstay, but neither of these methods has been put in practice. In
1822 Mr. Snow Harris proposed ("Observations on the effects of Lightning on Floating Bodies"), and subsequently caused to be executed for ships, conductors consisting of slips of copper, of sufficient thickness to prevent them from being fouled; these slips are inserted, in two layers, in a groove longitudinally in the mast, the jointed head layer being opposite the middle parts of the other, and they are fastened to the mast by copper screws. The whole line of metal passes down from the copper spindle at the top of the mast-head, and at the junctions is inserted a line of copper which forms the bottom of the cylinder from which the slips are made; this is connected with a plate of copper which is fixed on the keelson, at the step, and from thence there is a communication with the water by three copper bo's, which pass quite through the keel.

THURGAU, a canton of Switzerland, bounded on the north partly by the lake of Constance, and partly by the Rhine, which divides it from the canton of Schaffhausen; on the east and south by the canton of St. Gallen, and on the west by that of Zürich. The river Thur, which comes from the canton of St. Gallen and is joined by the Sitter from Appenzell, has given its name to the canton, the Sitter district of the Thür, the river crossing the middle part of the canton. The valley of the Thur is separated from the basin of the lake of Constance by a succession of hills which rise in terraces on both sides, and are intersected by several valleys. On the south and west sides of the Thur is the Thurgau, possessing many of the features of the Toss in the canton of Zürich. The whole country belongs to the plateau or table-land of Switzerland, and is a considerable distance from the Alpine region. The climate of the Thurgau is comparatively mild; a great part of the country is cultivated with fruit-trees, and cherry; the vine also thrives in several localities. The produce of corn is not sufficient for the consumption. According to a late return, there were in Thurgau about 38,000 head of cattle, 2850 sheep and goats, and 2350 horses. The rivers Thur and Melch are a source of abundance to a large extent.

The area of the canton is estimated at about 365 English square miles; and the population in 1835 was 84,124 inhabitants, of whom about 60,000 follow the tenets of the Reformed or Protestant communion, and the rest are Roman Catholics. German is the language of the country. About one-third of the population is employed in trade and manufactures. The principal manufactures consist of cotton goods, in which above 3000 looms are employed, and cotton fabrics, the wages of a workman being about 75 batzen, or eleven pence sterling per day. About 3000 pieces of fine linen from native flax are made annually; but this manufacture is on the decline. There are also spinning-mills and cotton factories, which produce yarns and fabric of quality from No. 40 to 60. The products of the commercial league have much diminished the exportation of manufactured goods. Some silks are manufactured for the French market. The other exports consist of wine, cattle, oats, dried fruit, and cider; these imports are—iron and metal ware, chiefly from England; coarse woodens goods from Germany; fine woollens from France and Belgium; fine cotton yarns from England; salt from Bavaria and Württemberg; colonial articles, and wheat.

The revenue of the canton amounts to about 102,000 florins, or 5800. sterlings, and is derived from duties on salt and other articles imported, stamps, transfers of property, and an income-tax.

Elementary education has been improved of late years. There are 159 schools, 200 pupils are for Fransian, 50 for Roman Catholics, and six mixed of both communions. About 17,000 children attend the schools. A school for teachers has been established at Kreuzlingen.

There is a fund, the capital of which amounts to about half a million of florins, for the support of the poor in the poorer sections which have a small poor's rate on property. The annual expenditure for the poor varies from 15,000 to 30,000 florins. There is a special fund for hospitals and almshouses. Switzerland in general is a country remarkable for its charitable spirit.

Thurgau is divided into eight districts—Frauenfeld, Arbon, Bischofzell, Toene, Weinfelden, Gottenheim, Steck- born, and Desshöfen. The principle towns are—1. Frauenfeld, which is the head town of the canton, situated in a fertile valley near the confluence of the river Mur with the Thur. It consists of 168 houses, besides other buildings, forming three wide streets; the inhabitants amount to about 1300. The old castle, formerly residence of the Swiss voeten or governors of Thurgau, the town-house, where the Helvetic diet used to assemble in the time of the old confederation; the parish church, and Protestant and Roman Catholic churches, are the chief buildings. 2. Steckborn, a small busy town pleasantly situated on the banks of the Zelensee, or smaller basin of the lake of Constance, has several manufactures, and about 1000 inhabitants. It is the chief place of considerable trade in agricultural produce, and has about 1000 inhabitants. 3. Bischofzell, at the confluence of the Sitter and the Thur, is a walled town, and has a collegiate church of the ninth century, an old cast of a school, and a garrison. 4. Arbon, a small town on the south bank of the Bodensee, or lake of Constance, which enjoys a splendid view, is said to be built on the site of a Roman station named Arbor Felix.

The present representative assembly is a legislative assembly, and acts as a council, \('\text{Kleiner Rath}'.\) The right of voting is enjoyed by all citizens, and the canton has been independent since a constitution was undergoing revision.

(Leroseh, Dictionnaire Geographique Statisque de Suisse; J. Bowring's Report on the Commerce and Manufactures of Switzerland.)

THURINGER WALD. [GERMANY; PHIL.]

THURINGIEN (Thüringen) is the ancient name of a tract of country in the central part of Germany situated between the Harz Mountains, the rivers Werra and Eder, and the Thuringerwald. These however not the boundaries of the great kingdom of Thuringia, which extended from the Elbe to the Elbe, the river Eder, the Rhine, the Danube, southwards to the vicinity of the Dalmatia, comprehended on the west the greater part of the old afterwards called Franconia. It cannot be positively maintained that the Thuringia of Parthenius was the original name of Thuringia. According to Galetti, it was formerly inhabited by the Cari, according to F. Wackerh and Wilhelm, by the Curi. Vegetius mentions the Thuringi about the year 404. Various conjectures have been made respecting the derivation of the name of the people, to which many of the authors, muc discussed with others. The history of the country is very intricate, and has been the subject of numerous works, such as Galetti's History of Thuringia 6 vols.; and Wackerh's History, in 3 vols. Thuringia gave over its produce of margrave to the Holy Roman Empire. Properly speaking, there is no country now called Thüringen: it is divided among Prussia, Saxony, and the principal towns, the Thuringia, of which it branches out near Müncheberg and Gera, the kingdom of Bavaria; near Eisenach, Markland; Salzungen it rises above the Werratal; near east along the frontier of the former circles of Erfurt, Saxony and Franconia, till it comes into the Saalethal (where however it receives the river of Frankenwald, and Declines, near Kronach, into Mainthal. The length is 70 English miles, and breadth is from 9 to 18 miles, containing 3400 square miles, and has a population of 232,000 inhabitants, living in 28 towns and 570 villages. It is a mountain-chain with a narrow ridge, and it is only near Schneckenkopf, on the road between Erfurt and Obdrecht, that there is a track. The two or three highest points are the Schneckenkopf, 2700 feet, and Inselberg, 2404 feet, above the level of the sea. The highest points consist of granite, clay-slate, and principally porphyry; the whole chain is clothed to the summit with pine-forests, mixed in a few places with oak and other timber. Numerous rivers rise in these hills, which flow on one side into the Elbe, and on the other into the Werra.

(Hasel, Geograph. Lexicon; Stein's Lexicon; Dihau, Conversations Lexicon.)
THURLOE. JOHN, who held the office of secretary of state during the Commonwealth, was born in 1616, at Alltars near Roding, St. Andrew, of which place his father, the Rev. Thomas Thurlow, was rector. He was designed for the profession of the law. Through the interest of Oliver St. John, who was his patron through life, he was appointed, in 1645, one of the secretaries to the parliament of the county of Lincoln. He was called to the bar after this, in 1647, received the appointment of receiver or clerk of the curators’ fines, ‘with at least 350l. per annum,’ says Whistlock; and in this place was Mr. Thurlow’s servant to Mr. Solicitor St. John. (Memorials, p. 296.)

Thurlow has left behind him a distinct denial of knowledge of or participation in King Charles’s death, which took place in London, well known, in January, 1649. Writing to Sir Harbottle Giffard, for the purpose of next year, he reports that St. John had been Cromwell’s councillor on that and on other occasions, and that I was the medium or hand between them by which their counsels were communicated to each other. He says, I was altogether a stranger to that fact and to all the counsels about it, having not had the least communication with any person whatsoever therein. (Thurlow’s State Papers, vol. vii., p. 914.)

It was very unlikely that a person in Thurlow’s cabinet at the time should have been consulted; and if it were a question of any importance to the king, no doubt he approved of the king’s death or not, his subsequent continual identification with the authors of that event our middle than to fix him with responsibility.

On the 11th of September, 1653, Thurloe, one of the officers of the treasury of the Company of undertakers for draining Bedford Level, a new effort to drain this tract of country having been set on foot the year before, was taken to task by Lord Hare. In a letter from St. John to Thurlow, dated April 13, 1652 (State Papers, vol. vii., p. 205), which is interesting as showing the terms on which Thurlow and St. John were, we find that Thurlow was then on an official tour of inspection. ‘Now you are upon the tour, don’t forget to see all the works on the north side of Bedford river to be begun. Pray by all means have I don’t know whether the river bed is finished as to the bottoming.’ In the same letter directions are from St. John, now lord-chief-justice, for the purchase of a place for him in the household of London, from which it would appear that Thurlow was in the habit of managing St. John’s private affairs for him. The same letter contains St. John’s congratulations to Thurlow on his appointment as secretary to the council of state, which appointment had just taken place. He is asked to recommend Sir Henry Vane, and to treat the matter with Mr. Paston, as to your election into Mr. Frost’s place, with the circumstances. God forbid I should in the least repine at any his works of Providence, much more at those relating to your own good, which is good of many. No, I bless him. As soon as I heard the matter I cared for you, and thought upon those goods. No, go on and prosper: let not your hands faint: wait upon Him in your ways, and he that calleth you will cause his presence and blessing to go along with you. In the course of the previous year, 1651, Thurlow had been to the Hague, as secretary to St. John and Strickland, ambassadors to the states of the United Provinces.

When Cromwell assumed the Protectorship, in December, 1653, Thurlow was appointed his secretary of state; he continued to hold this distinction till the end of December, in the February succeeding, elected a-bench of the society of Lincoln’s Inn. Thurlow was elected member for the Isle of Ely in Cromwell’s second parliament, called, in June, 1654, and framed on the model prescribed by the act of the parliament of 1648. He was re-elected for the Isle of Ely in the next parliament, called in September, 1656. Cromwell obtained from this parliament an act setting the office of post of letters, both inland and foreign, in the state for ever, and granting power to the Protector to let it into the hands of others, when he thought it reasonable; and it was let by him to Thurlow, at a rent of 4000l. a year, as we learn from a memorandum drawn up by him when the Rump Parliament had cancelled the contract. When the protectorate was abolished, he was compelled to resign; but he had managed so to let the post as to make his farming of the postage. The salary of his secretaryship of state was 800l. a year. He is described in a ‘Narrative of the Late Parliament,’ reprinted in the Harleian Miscellany (vol. iii., p. 453), as ‘secretary of state and chief postmaster of England, places of a vast income.’

There is the following entry in White Locke’s Memorials, under the date of April 9, 1657:—‘A plot discovered by Major General Harrison and many others of the Fifth Monarchy Men’ (p. 656). Thurlow afterwards, by Cromwell’s desire, reported on the subject of this plot to the parliament, and received in his place the thanks of the house, through Major Speaker, for this detection of the plot, and ‘for the great services done by him to the design of the parliament, both in this and many other particulars.’ On the 13th July, 1657, he was sworn one of the privy council to the Protector, appointed in accordance with the Humble Petition and Advice. Honours now came thick upon him. In the same year 1658 he was one of the governors of the Charter-House and chancellor of the university of Glasgow.

In September, 1658, Cromwell died, and his son Richard was proclaimed in his stead. In the parliament that was called in December, Thurlow was selected to sit for Tewksbury, in a letter which is worth extracting, as showing his estimate and position at this time, and the spirit of constituencies:—‘Noble Sir, We understand that you are chosen so much as to persuade many out of our free and unanimous electing you one of our burgesses in the next parliament, and to sit a member for this place. Sir, we are so sensible of the greatness of the obligation, that we know not what expressions sufficiently to demonstrate the true representation we present we beseech you to accept of this for an earnest, that whomsoever you shall think worthy to be your partner shall have the second election; and our zeal and affection to your honour and your service, which we have the care of our privileges and concerns.’ (State Papers, vol. vii., p. 587.) Thurlow made his election to sit for the university of Cambridge.

The meeting of this parliament was the beginning of discontent and the fall of Cromwell. In November, Thurlow, in a letter to Henry Cromwell, viewing the complaints of the army and of the opposition in parliament as pointed principally against himself, and stating that he had asked the Protector’s permission to retire from his office, says, ‘I trust, in your return to your private duties, and in the exercise of your own opportunity, and may do the same thing with myself with better acceptance, having not been engaged in many particulars, as I have, in your father’s lifetime, which must be the true reason of these stirrings; for they were all set on foot before his now highness had done or refused one single thing, or had received any advice from any one person whatsoever.’ Thurlow remained however secretary of state. It was one of the objects set before themselves before the fall of the Protectorate, who, by uniting with the republican party, formed a most troublesome opposition to Richard Cromwell’s government, to impeach Thurlow; but this object was yet undeveloped when the parliament was dissolved. Thurlow appear chief counsel against the dissolution. The immediate consequence of the dissolution was the summoning, by Fleetwood and the council of officers, of the Rump of the Long Parliament, and Richard Cromwell’s deposition.

* It is generally stated otherwise, on the authority of the following passage in Whitelocke:—‘Richard in Drayton’s Works, Thurlowe, myself, and some others, whether we were not fit to dissolve the present Parliament: most of us were not then in our right senses, but in a true reason of the case, this business was not of us reasonable; and it was let by him to Thurlowe, at a rent of 4000l. a year, as we learn from a memorandum drawn up by him when the Rump Parliament had cancelled the contract. Those mentioned are very few of the council, and, even if they had been more, it would be quite inconceivable that they could have been in it. That Thurlow strenuously opposed the dissolution is distinctly stated; and with circumstantial mention of the business, in Calamy’s Life of Henry, who was a Works, p. 8, ed. 1724, vol. 2. We know further that the dissolution was urged on Richard Cromwell by the King’s Secretary of State and Lord President of the House of Lords, Sir John Ker, and by the Earl of Arundel and the Countess of Arundel. Thurlowe says, a little afterwards, of the dissolution, that it caused much trouble in the minds of many honest men; the Cavaliers and Parliamentarians reproached it at it. One of the many homes men was doubting Thurlow. See also Calamy’s State Papers, vol. iii., p. 620, ed. Drayton's Works, Thurlowe, myself, and some others, whether we were not fit to dissolve the present Parliament: most of us were not then in our right senses, but in a true reason of the case, this business was not of us reasonable; and it was let by him to Thurlow, at a rent of 4000l. a year, as we learn from a memorandum drawn up by him when the Rump Parliament had cancelled the contract. Those mentioned are very few of the council, and, even if they had been more, it would be quite inconceivable that they could have been in it. That Thurlow strenuously opposed the dissolution is distinctly stated; and with circumstantial mention of the business, in Calamy’s Life of Henry, who was a Works, p. 8, ed. 1724, vol. 2. We know further that the dissolution was urged on Richard Cromwell by the King’s Secretary of State and Lord President of the House of Lords, Sir John Ker, and by the Earl of Arundel and the Countess of Arundel. Thurlowe says, a little afterwards, of the dissolution, that it caused much trouble in the minds of many honest men; the Cavaliers and Parliamentarians reproached it at it. One of the many homes men was doubting Thurlow. See also Calamy’s State Papers, vol. iii., p. 620.
The letters written during Richard Cromwell's short Protectorate, in the third volume of Clarendon's 'State Papers,' are full of acknowledgments of Thurloe's influence with Richard Cromwell, and of the importance attached to him by the intriguing Royalists. Thus, Cooper, one of Hyde's spies, writes to him, February 13, 1659, 'Mr. Grimston, who is now at his house, has had a letter from Mr. Thurloe, who, says he, loves me not; but sure it is, he hath power to dispose of men, of any importance, of his own interests. Thurloe's malice, I doubt, will never suffer him to do us good.' Again Hyde writes to another of his agents, Milnes, Feb. 26, 1659, 'Thurloe is not a man to be meddled with, he has thought of more importance, or have given more in charge to our friends since the beginning of the parliament, than they should advance all charges and accusations against Thurlow. He, who will never fish of serving the king; and if they two were thoroughly prosecuted, and some of the members of the High Court of Justice, Cromwell's spirits would fall aspace' (p. 428).

It is strange, Hyde writes a month after, March 10, 1659, 'they have not in all this time fell upon Thurloe and these other persons who advanced Cromwell's tyranny' (p. 436). Then overtures to Thurloe to aid the king are thought of. 'I do confess to you,' Hyde writes, 'I cannot comprehend why Thurloe, and even his master St. John, should not be by this time with the king. With the king, they should not reasonably promise themselves more particular advantages from thence than from anything else that is like to fall out' (p. 449). After the dissolution of the parliament, the thoughts of rewards that had been entertained of soliciting Thurloe's and St. John's aid (p. 477). But Thurloe afterwards becomes again an object of fear to Hyde. During the government by the army, he writes, 'I do less understand how Thurloe shapes, and is in danger in the present state of the Parliament, and have the same time employed in the greatest secrets of the government, for I have some reason to believe that he meddles as much as ever in the foreign intelligence' (p. 532).

On the 14th of January, 1660, Thurloe was succeeded in his position of state by Sir John Winter, member of the parliament party; but he was reappointed on the 27th of February. His patent as chief postmaster had been cancelled in the interval, on the 2nd of February. (Commons' Journals, vol. vii., p. 532.) In the movements that followed for the succession of Charles II. Thurloe made an offer of his services to those who were bringing about that event. Sir E. Hyde writes to Sir John Gresham, April 23rd, 1660, 'We have, since I saw you, received very frank overtures from Mr. Thurloe, with many professions of resolving to serve the king, and not only in his own endeavours, but by the services of his friends, who are easily enough guessed at. This comes through the hands of a person who will not deceive us, nor is easily to be deceived, also from such a person, and exempted from such reputation and exclusion to other, which cannot at first be discerned. ... The king returned such answers as are fit, and desires to see some effects of his good affection, and then will he find his service more acceptable.' (Thurloe's 'State Papers,' vol. vii., p. 897.) And Hyde goes on to instruct his correspondent to consult Monk as to Thurloe's character, and as to his power to be of use, supposing he were sincerely willing. On the 15th of May Thurloe was accused by the parliament of high treason and ordered to be secured; but on the 29th of June a vote was passed allowing 'liberty to attend the secret of state, at such times as they [the House] shall appoint, and for so long a time as they shall own his attendance for the service of the state, without any trouble or obstruction.' During such an attendence, 'the king's going and returning to and from the secret of state, any former order of this House notwithstanding.'

After his release from imprisonment, he retired to Great Whalton, in Suffolk, where he generally resided, except in term-time, when he resided at Cambridge. He died at Cambridge on the 16th of January, 1668. It is said that he was often solicited by Charles II. to resume public business, and always refused, telling the king that he despaired of serving him as he had served Cromwell in government; he was to seek for places, and not for men. (Birch's 'Life of Thurloe.' State Papers, p. ix.) Thurloe died at Lincoln's-Inn on the 21st of February, 1668.

He had been twice married, and left four sons and two daughters, all by his second wife, a sister of Sir Thomas Overbury. He was possessed, during the days of power, of the manor of Whittlesey St. Mary's, and Whittlesey in Andrews, and the rectory of Whittlesey St. Mary's, in St. Isle of Ely, and of Wisbech Castle, which he retained. But after the Restoration they reverted to the Bishop of Ely. There is an entry in the Commons' Journal of 5th of May, 1660: 'Mr. Secretary Thurloe put out to tender, and a warrant issued for the sequestration of his estate.' (vol. iii., p. 43.) Thurloe describes his estate at Astwood, Buckinghamshire. Thurloe does not appear to have possessed any striking qualities, either moral or intellectual, to impress the minds of his contemporaries; and we know little else of him than what we are told by Burnet. But from Burnet's story, it might appear that he was not of a very generous disposition, or much liked by those who were under him. Morland attributed his misconduct to 'Thurloe's bad character.' (p. 220.) So Burnet's story, is, that Thurloe treated lightly information which had been given him of the design on Cromwell's life, and that when, on the subsequent discovery of his guilt, his apologists said that he had been given to Thurloe, on which he had not acted, and blamed Thurloe for his conduct, Thurloe availed himself of his influence with the Protector to malign his informer: 'So he (the informant) found,' says Burnet, 'how dangerous was it to suspect him, and how just it was, when a minister was wounded in the doing of it, and that the minister would be too hard for the prince, even though his own safety was concerned in it' (vol. i., p. 79).

Thurloe's 'State Papers,' 7 vols., fol., 1742, contains a large number of letters and papers written by Thurloe, with a number of private letters and papers. They were edited by Dr. Birch, who gives the following history of Thurloe's papers: 'The principal part of this collection consists of a series of papers discovered in the reign of King William, in a false ceiling of the chambers, of Secretary Thurloe's chambers, No. xii., near the chapel at Lincoln's-Inn, by a clergyman who had borrowed some papers, during the long vacation, of his friend Mr. Astwood, who was the owner of them. The clergyman gave after disposal of the papers to the Right Honourable John Lord Somers, then lord high chancellor of England, who caused them to be bound up in 67 volumes in folio. These afterwards descended to Sir Joseph Jekyll, master of the rolls, who gave them to his son, and to his son, an officer, to the late Mr. Fletcher Gyles, bookseller. They were published by Mr. Gyles's executors. Dr. Birch, the editor, received many other papers from different individuals, removed from Lord Sholtofne and the then archbishop of Cantebury, which he has incorporated in the collection. For historical purposes this is an invaluable collection.'

THURLOW, EDWARD, LORD, was born in the year 1732 at Little Ashfield near Stowmarket in Suffolk. His father, Thomas Thurloe, was a clergyman, and held the living of Little Ashfield, in the county of Suffolk, which was in the gift of the archbishop of Canterbury in Mary's in Norfolk. After receiving the rudiments of his education from his father, young Thurloe was sent to the grammar-school at Canterbury at the suggestion of Dr. John Donne, the remarkable dean of St. Paul's Cathedral. He was a pupil of Mr. Coper, upon the authority of Sir Egerton Brydges, to gratify a malignant feeling towards the head-master, placing under his care 'a daring, refractory, clever boy, who would be sure to torment him.' The motive was not in any measure accounted for. Young Thurloe's ambition was not to pull down any poetical eminence over him, but to obtain an academic honours, and was compelled to leave Cambridge abruptly in consequence of turbulent and exasperating behaviour towards the dean of his college. Soon after quitted Cambridge, he was entered as a member of the Society of the Inner Temple, in Michaelmas term, 1754.
Thurlow immediately applied himself to the practice of his profession with great assiduity; and although he brought with him an indifferent character from the university, he attained unusually early to reputation and em- ployment both in the Westminster, and in the Court of Chancery, where his name appears frequently in the Law Reports soon after he was called to the bar; and his success in the profession he had chosen was clearly ascertained in less than seven years from the commencement of his practice. In 1771 he was called to the bench, and was, for the most part, devoted to his professional occupation.

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In the new parliament called in 1788 he was returned as member for the borough of Tewkesbury, and became a constant attendant at the bar. He was appointed solicitor-general in March, 1770, and Blackstone's refusal to accept it ('Life of Sir William Blackstone,' prefixed to Blackstone's Reports) Thurlow received the appointment, and in January, 1771, he was appointed to the office of solicitor-general. Soon after his introduction to office, he attracted the particular notice of George III. by the zeal and energy displayed by him in supporting the policy of Lord North's government. The king was pleased to take particular notice of the able and zealous execution of the duties of the office which he had assumed.

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speeches respecting America during Lord North's administration, affords a striking example of political inconsistency. A circumstance is recorded in the 'Memoirs of Sir Samuel Romilly' (vol. ii., p. 124), which proves that till within a few months of his death Lord Thurlow was still confidently consulted by members of the family.

The hagiology of the charges made by Lady Douglas against the princess of Wales in 1806, the prince (afterwards George IV.) directed that Thurlow should be consulted, and the particulars of the interview between him and Sir Samuel Romilly are characteristic and very interesting.

Lord Thurlow died at Brighton, on the 12th of September, 1826, after an illness of two years.

Thurmer, Joseph, a German architect of some note, was born at Münster (1740) and died in Paris (1823), but he did not begin to apply himself to architecture professionally until 1817, when he became a pupil of Professor Fischer's, and had for his fellow-students Gärtnert, Ziobland, Oehmuller [Oehmiller], and many others who have since rendered themselves more or less distinguished. At the end of the following year (after a previous visit to Rome at the expense of his friend Dr. Goecke), he went to Rome, and Koehl, in a professional excursion to Greece, where he spent five months in studying and drawing the remains of buildings at Athens, some few of which he published on his return, with the title of 'Aegae et Aghion Athenas,' being published in 1793-4. He did not however confine himself to the study of the Grecian style, nor was he such a prejudiced admirer of it as to have no relish for anything else; on the contrary, he considered the Italian style of the time of Leo x. to be equally natural and real, and he did not hesitate to be far better, more faithfully and tastefully, represented by means of engravings than it previously had been. He accordingly joined with Gutenbohn in bringing out a 'Sammlung von Denkmäler,' etc., of architectural Studies and Decorations from Buildings at Rome, of the fifteenth and sixteenth centuries, the first number of which appeared in 1786; but, unfortunately, it did not meet with the encouragement it deserved, and was therefore given up, when very little profit had been made by it. The publication however was so far advantageous to Thurmer, since it recommended him to notice, and led to his receiving (1827) at the same time two different invitations, one from Frankfurt, the other from Dresden, to which last he gave the preference of it; he was thus made professor-extraordinary at the school of architecture, and in 1832 was promoted to be first professor of architecture, in which capacity he did very much for the advancement of the art and the improvement of taste. Thurmer has left but little excepted by himself in that city, the only public building in it entirely by himself being the post-office (for though the 'Hauptwache,' or guard-house, was erected by him, it was after Schinkel's designs), his opinions had a very great influence. That he should have had so few opportunities for displaying his ability, is not very surprising, nor does it detract from his reputation, since he did not long survive the completion of his first edifice: he died November 13th, 1833, while staying at Munich. What he might have done, had a longer life been granted him, is shown by the number of designs he left, all more or less stamped by originality and artistic feeling. That the grateful regard expressed for his memory and his talents by his friends and pupils was not the fruit of transient enthusiasm, but the result of having created a bronze bust and monument to him, in 1838, at the Academy of Arts. (Convers. Lx. der Neuesten Zeit; Morgenblatt, 1838.)

The Thurneysser zum Thurn, Léonard, a celebrated alchemist and vintner, was born in 1530 at Atlas, where his father carried on the trade of a goldsmith. He was himself brought up to this employment, but he was obliged to leave his native place when eighteen years of age, on account of having sold to a Jew a piece of gilt lead for pure gold. He first went to England, thence to France, and afterwards to Germany, where he enlisted among the troops of the margrave of Brandenburg. The following year he was taken prisoner; from that time he gave up a military life, and having visited the mines and foundries of Germany, he returned to France, where he came back in 1551 to Nürnberg, Strassburg, and Kostnitz. Here he again carried on the trade of a goldsmith, and made much money by it, till, on account of his reputation for skill in the art of mining, he was sent for to the Tyrol to superintend different mineral works. Accordingly in 1558 he went to Tirol in Upper Inthall, and established on his own account in that place, as well as at St. Leonhard, Seinsdorf, for the paying of salaries, the success of which contributed still more to his celebrity. The Archduke Ferdinand had so much confidence in him that he sent him to travel in Scotland, the Orkney Islands, Spain, and Portugal. Thurneyser also visited the coasts of Barbary, Diu, Egypt, and Tunis, as well as the Tyrol in 1562. Two years afterwards, at the request of the same prince, he again visited the mines of Hungary and Bohemia. The publication of his works made him determine to go to Münster and Frankfort. He lived at the Tyrol, but did not remain there many years. He had become acquainted with the Elector of Brandenburg, whose wife he cured of a dangerous illness, and who resolved to attach him to his service in the hope that he might discover in his estates some unknown medicinal treasures. Thurneyser accordingly became physician to the prince, and accompanied him to Berlin, where, from his skill in profiting by the prejudices and weaknesses of his contemporaries, and from being acquainted with all the resources of charlatanism, he soon became necessary to the court, and also in passing himself off for one of the most learned and scientific men of his age. At length however, by the envy of others, and still more by his own impiedance, his decep tions were discovered, and he was, in 1564, obliged to leave Berlin and proceed to Prague. After having thus led a wandering life for some years, he died at last in a convent at Cologne, at the age of sixty-six, in 1596. He was an advocate for the pretended secrets of alchemy and uranomancy, and his most remarkable piece of work is the proof of the insignificance of that art, which may be acquired in an ignominious age by a bold and enterprising man, when he possesses some little information above the generality of his contemporaries. It is written in a curious style, and contains a number of characters by him who is now very seldom looked into. The titles of twelve of them are given in the Biographie Medicale, from which we take the preceding account is taken.

The Thurnitz, or Thurocz, is a small county in Hungary, and lies on this side of the Danube. It is bounded on the north by Arva, on the east by Leptan and Sátó, in the south by Bars, and on the west by Neitra and Trencz. Its area is 448 square miles, and the population 40,000 inhabitants, chiefly Swedes, of whom about two-thirds are Poles. The third Roman Catholic church is the 500 Jews. 'This country is justly called a beautiful garden' (says the anonymous author of the description of Hungary, Croatia, and Slavonia), for it is surrounded on all sides with lofty mountains, and presents the most beautiful scenery. This garden has only two entrances in the northern part through which the river Wag enters and leaves the country. The first entrance is between the two mountain-chains called the Great and the Little Fron, and the other near Strezno. The Great Frons has two summits, the Stock, 4676 feet high, and the Thurocz Krvian, 4680 feet high. 'The climate is cold, but healthy. Though the soil is fertile, there is no superfluity of natural productions produces no wine, but nearly sufficient corn (chiefly barley and oats, that some portion can be exported. Pulse of different kinds abound, especially large and excellent peas. Potatoes are extensively cultivated, and also a sort of turnip peculiar to Hungary. The inhabitants collect a considerable quantity of salt from the mountain-pines, which is sold to the common people, and extolled as possessing great medicinal virtues: it is exported to Germany, and even to America. The humus is extremely good on the slopes of the hills and the numerous valleys. Of 158,920 acres of productive land, only 62,442 acres are arable, and 83,785 acres are covered with forests. The chief town is St. Martin, on the river Thurocz, which has about 200 inhabitants, and is a handsome county-hall, and five large Roman Catholic churches. (Hassel, Geography; Blumenbach, central European Monarchies.)

THURROCK. [Essex.

THURSO. [Caithness.

THURSO.
THYME. (Thymus.) A natural order of plants belonging to the tuberous group of Incomplete Exogens. The name of this order is derived from Thymelaea, a plant spoken of by the ancients, and which some have supposed to be the Daphne Gnidium, a plant belonging to the present order. This order consists of shrubs or small trees, very rarely herba-
ceous, with non-articulated, sometimes spiny branches having a very tenacious bark. The leaves are entire, simple, without stipules, and alternate or opposite. The flowers are capitulate or spicate, terminal or axillary, occasionally solitary. The calyx is tubular, coloured, 4-leafed with an imbricate
activation; the stamens 2-4 or 8 in number, inserted into the tube with 2-2ed anthers, dehiscing lengthwise in the middle; the ovary is solitary, with a solitary pendulous ovule; the fruit is hard and dry, or drupaceous; the seed has little or no albumen, a straight embryo, with a short racdicle and entire coteleons. This order is related to Santalaceæ, from which it differs in its inferior calyx. It is also allied to Elaeagnaceæ and Proteaceæ, from both of which it is distinguished by its pendulous ovules. Lindley refers to this order Bartling's Anthoboeæ, on account of their superior fruit. [Exocarpus.] The species are found in Europe, but are not common; they occur in greatest abundance in the cooler parts of India and South America, at the Cape of Good Hope, and in New Holland.

The most prominent property of this order is their caust-
ticity, which resides in their bark. When applied to the skin, it produces vescation, and pain in the mouth when chewed. The bark of several of the species is very tough, and may be manufactured into cordage. Pascernia tincto-
toria yields a dye which is used in the south of Europe to colour wool yellow. The various species of Daphne pos-
se destructive properties; some are used for dyeing, some are poisonous, and the Daphne Lagetta is the Lace-bark-tree of Jamaica. [DAPHNE.]

1. Cutting with flowers; 2. slip with fruit; 3. single flower; 4. calyx opened, showing the insertion of the stamens; 5. section of ovary, showing the single pendulous seed.

THYMY [Tummys], the name of a genus of plants belonging to the natural order Lamiaceæ or Labiatae. It has an oval bilabiate calyx with thirteen ribs; the upper
lip is trifid, the lower lip is bifid with ciliated subulate
segments, and throat villous inside; the corolla with the upper lip erect, nearly plane, notched, lower patent and trifid; stamens straight, exerted; anthers 2-celled; styles bifid at apex. All the species are small under-shrubs

with usually purplish flowers. Between twenty and
thirty species have been described by botanists, most of
them inhabitants of Europe, especially the region of
the Mediterranean: one only is a native of the British
Isles.

T. vulgaris, Common or Garden Thyme, is an erect plant, or sometimes partly prostrate; occasionally native of Europe, in dry plains and on hills, and uncultivated places free from woods. The plant is very much branched, and has purplish flowers. This species is cultivated for culinary purposes, and many varieties of it are met with in gardens. It has a tenacious property which are communicated to water by infusion only to a slight extent. They depend upon an essential oil, an ounce of which may be obtained from thirty pounds of the

T. serpyllum, Wild Thyme, or Mother-of-Thyme, is a suffrutescent plant, with capitate flowers, branched decum-
beent stems, with plain, obtuse, entire, petiolate leaves, more or less ciliated at the base. It is a native of
Europe and the north of Asia. This plant has the same
sensible properties as the last, but is more inclined
to produce varieties, several of which have been described as
species. These vary principally in the colour of the
dark blue and the leafless and the leafy. One of the
varieties, T. s. citratus, is known by the name of Lemon-
Thyme on account of its scent resembling the lemon. The
seeds will not however maintain this property: if required
be preserved, the plants must be propagated by means
of slips or cuttings.

Both this and the former species, when cultivated, are
best raised by means of seeds, although they may be easily
propagated by parting the roots or planting slips and cul-

The seeds can be sown in March or April, in a light
fine soil, and when the plants are two or three inches
high, they should be transplanted. Roots or slips should
be planted in the autumn. The plants produce abundance
of seeds in the summer and autumn, when, gathered,
should be rubbed out, and preserved for planting in the
following spring.

These plants are not so much used in medicine as for
culinary purposes. The volatile oil is frequently used as
an application to various teeth. Linnæus recommends
them as a remedy for dissipating the effects of intoxicating
liquors, and a decoction is used in France as an application
for the itch.

T. mastichina. Mastich-Thyme, the Herb-Mastich, has
one or more, oblong, obtuse, petiolate leaves, narrowed
at the base and not ciliated; the calyx is villous, with feathery sub-
ulate teeth, which are longer than the tube. It is a native of
dry, sandy, uncultivated places in Spain, Portugal, and
Barbary. It exudes a scent resembling mastich. It is the
Morum vulgare of older botanists, and at one time
had some reputation as an eriphene. Several other species
of thyme are cultivated; they do not require much care;
the more delicate and rarer kinds are found amongst
collections of alpine plants.

THYMUS GLAND, which in the calf and lamb is
called the sweetbreads, is an organ situated behind the
sternum, in the anterior mediastinum, in front of the peri-
cardium and the large vessels arising from the heart.

It is composed of two chief portions, which, by careful dissection, may be sepa-
rated in the middle line. At each end it bears two pro-
cesses or horns, of which the upper are larger and more
slender than the lower, and the right are usually longer
than the left. It is supplied by several branches from the
internal mammary, inferior thyroid, and mediastinal arte-

ties, to which veins of considerable size correspond. Its
absorbing vessels are numerous and large, but not more
so than in other glands of equal size. The thymus gland is composed of a great number of
similar small masses or lobules, which may be separated

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by dissection, and are held together by fine cellular tissue continued from that which invests the whole gland. The lobules vary in size from half a line to three lines in diameter, and have simple or complex cavities filled with a milky fluid. Sir Astley Cooper (The Anatomy of the Thymus Gland) says that the lobules are arranged in spiral lines, so that the gland may be unravelled into a sort of knotted rope of lobules, which are wound around a central cavity or reservoir, to which the cavities of the lobules communicate. But the existence of such a central cavity is not generally admitted.

The cells of the thymus gland are, in young and healthy animals, opaque and creamy. It has been particularly examined by Mr. Gulliver (Appendix to Gerber's General Anatomy), who has found that both in its chemical composition, and in the abundance and structure of the globules which it contains, it closely resembles the fluid of the lymphatic glands.

Of the function of the thymus gland scarcely anything probable is known. Whatever it be, it is performed most actively during fetal life and the first year of extra-uterine life: for during this time the thymus gland grows at the same rate as the rest of the body, its cells are full of fluid, and the fluid is thick and abundant in globules. From the end of the first to the end of the third year its size does not increase much, but after the fourth and fifth years it grows, some minishes, and after the twelfth or fourteenth year it is rare to meet with more than a slight trace of it. It is also of considerable size and is full of fluid in hypernating animals: and this, together with its activity during fetal life, has suggested that its office is in some way connected with the preparation of the blood, when respiration is either inactive or has not commenced. But, in these same circumstances, digestion is not going on, and it is therefore just as possible that the thymus gland may have the office of preparing a fluid and globules, like those of the chyle, from the materials which have served for the nutrition of the body and have been re-absorbed; in other words, that its function is analogous to that of the lymphatic glands.

The gland is termed (Epochs of Enquiry); it is supported by the observations of Mr. Gulliver and many others, and is on the whole more probable than any other yet advanced.

The thymus gland is rarely diseased. The only affections of it, if it has described are an unnatural enlargement of it, and its persistence in the dimensions which it has in fetal life. When it is enlarged there is generally a more than usual development of all the lymphatic glands; and more particularly spherical organs, as the thymus which are at the signs of a general disorder of the health, such as rickets, hydrocephalus, &c. It has been supposed, especially by the German pathologists, that a peculiar affection of the respiration, which has been called Thymic Asthma, is the general cause of their deaths. In such cases, the signs of the affection of the two affections is not yet clearly established.

THYONE. [Holothuria, vol. xlii, p. 289.]

THYROID GLAND is an organ situated in the middle and fore part of the neck, in front and by the sides of the thyroid cartilage of the larynx (from which it has its name), and of the cricoid cartilage and the upper part of the trachea [Larynx], to which it is closely fixed by cellular tissue. It is composed of two chief lateral portions or lobes, and a smaller portion or isthmus connecting them. A fourth portion, which is long and slender, and named the middle column or horn, usually passes upwards from the isthmus in front of the larynx. The lateral lobes are composed of masses of blood-vessels, two superior and two inferior thyroid arteries; the former are branches of the external carotid, the latter of the subclavian arteries; their branches communicate freely in the gland, and they are accompanied by veins and lymphatics of the same name. The inferior thyroid arteries contain numerous very minute cells, lined by polished membranes, and in young persons filled by a clear albuminous fluid, in which, or in the walls of the cells, there are numerous small spherical or polyhedral psudecells.

Of the function of the thyroid gland no more is known than of those of the spleen and thymus gland, between which it seems, in structure to hold an intermediate place or to be in its vascularity a far greater than is required for its nutrition, and the thymus in the existence of cells containing a fluid, and in its development during early life. What has been said of their probable functions might be repeated here.

The thyroid gland is changed by changes of structure, most of which, being attended with enlargement, as comprehended in the name of bronchocoele or goitre [BRONCHOCOELE], to which the reader is referred. In many cases the cells of the gland are enlarged, and its structure is much increased. It is possible to go on with difficulty discernible, may in some be easily demonstrated.

THYSANOPTODA. [Stomatape, vol. xiii, p. 61.]

TIA’RA (rapi or rapipe), a high kind of hat, which was and is partially worn in the Middle Ages, especially in Western Asia, especially by the Persians, Parthians, Armenians, and Phrygians. There were two kinds of names: the upright tiara was only used by kings, priests, and other persons of the highest rank, and the upper part had frequently the shape of a crown; the tiara worn by other people was of a soft and flexible material, so that it hung down on one side, as in the case of the so-called Phrygian bonnet. (Hesychius and Suidas, c. e. rapipe.) The tiaras of persons of high rank were of the most costly materials, and were often studded with gold and precious stones. (Ovid, Metamorph. xi. 181; Valerian Ficucca, vi. 699; compare Dictionary of Greek and Rom. Antiq, under Tiar.)

TIA’RI’NI, or Tiarini, an Italian term tiara is applied to the head-dress of the popes, which is worn on solemn occasions, and consists of a triple crown. Hence it is also used in a negative sense to designate the papal dignity.

TIA’RI’NI, Mr. Swannson's name for a genus of 'Mirinae; its term for the subfamily of testaceous molluscs, the shells of which are termed 'Mirites' by collectors. [VOL.-

TIDE. N.B. This generic name comes too near to that of Tiarini, ALESSANDRO, one of the most celebrated painters, was the Bolognese school, was born at Bologna in 1657. He first shewed his pictures at Fontana's death in 1697, under Bartolomeo Cesi, but having in a quarrel discharged a pistol or similar weapon at a fellow-scholar, without however doing him any injury, he was obliged to fly from Bologna. He went to Florence, and there engaged himself with a portrait-painter, for whom he painted hands and draperies, and some of his performances having attracted the notice of Domenico di Passignano, he was admitted by that painter into his studio, and he spent a long time there. He has been dead a few years, and by that time acquired so great a reputation, that he received invitations from Bologna to return to that city; in Bologna his works excited universal admiration for their invention and earnestness of character, and for their breadth of expression, and for the correctness of design and the beauty of colouring: the tone of Tiarini's pictures is sombre; he used little red, and avoided gay colours generally. His works, which are very numerous, consist chiefly in altar-pieces; he executed comparatively little for those in public places alone, in Bologna and its vicinity and in Mantua, Modena, Reggio, Parma, Cremona, and Pavia, amount to upwards of two hundred: their subjects are generally of a melancholy or serious nature. The following are the most celebrated:—A Miracle of St. Domenico, in the Capella del Rosario, in the church of San Domenico at Bologna, painted in competition with Lazzaro Spada, in which the saint restores a dead child to life; the Coronation of a dead man, in the convent of San Michele in Bologna, and St. Petronio, in Bologna; Christ, standing outside the door of the house of the high priest, with the Mocking of Christ in the background, illuminated by torchlight.

Tofinetti, a painter whose style Tiarini ultimately adopted, was a great admirer of his works: when he first saw Tiri-

nin's picture of the Miracle of San Domenico, he is re-
Several of Tiarini's pictures have lost their colour, owing to his practice of glazing; in some the colouring consists entirely of glazed tints, the design being executed in grey. He opened a life academy in Bologna, and had many scholars. Malvasia has preserved several of a famous model that he used frequently to engage, Valtrago. Tiarini died in 1689, aged ninety-one.

The church of San Lorenzo, that of S. Fedele, and that of the Jesuits. But the work which, if less celebrated than some of his others, is considered by one of his critics his chef-d'œuvre, and a masterpiece for the contrivance and beauty shown in it, was his "Casa Proponenti," or that of the Lord of the island of Elba, at Genoa, with its church, &c., where he completely mastered all the difficulties arising from the inconvenience of the site. Neither his fame nor his works were confined to Italy, for the former caused him to be invited to Spain (1583), by Philip II., who in that capacity of architect and in that of painter, in which last he executed many admirable frescoes in the Escorial. Liberally rewarded, he also conferred on him the last reference of Marquise Teresa de Alba, who died in 1588. After returning to Italy after passing about nine years in Spain, and died at Milan in 1598; such at least is the date assigned by Tiraboschi, though some make it much earlier, 1540 or 1501, and others about as much later, viz. 1606.

(Tiraboschi; Lanzi; Milizia; Nagler.)

TIBALDI, DOMENICO, younger brother, not son of the preceding, as he is sometimes called, was born in 1541, and was, if not equally celebrated, like him both a painter and architect, but more illustrious than in the other character. He executed many buildings at Bologna, the principal among which are the Palazzo Magnani, the Dogana, or custom-house, the chapel in the cathedral, so greatly admired by Clement VIII. as being more beautiful than any other of the kind at the time, and the church of the Madonna del Domo. Domenico also practised engraving with success, and in that branch of art he was the instructor of Agostino Carracci. He died at Bologna in 1630.

(Milizia; Nagler.)

TIBBOOS, [SAHARA.]

TIBER. [PALATE STATE.]

TIBERIUS. [PALESTINE; SYRIA.]

TIBERIUS CLAUDIUS NERO was born in Rome, on the 16th November, 42 B.C., according to Suetonius. He belonged to the gens Claudia, an old patrician family of great distinction, which was known for its aristocratic pride. Tiberius belonged to this house by the side of his father, Tiberius Claudius Nero, an Emperor. His wife, Livia Drusilla, who was the niece of her husband, was the daughter of Appius Pulcher. This Appius Pulcher was a brother of Tiberius Claudius Nero the elder, and they were both sons of Appius Cæsus. His father was quaeator to C. Julius Cæsar, and distinguished himself as commander of the fleet in the Alexandrian war. He became successively praetor and pontifex, and in the civil troubles during the triumvirate, he followed the party of M. Antonius. He was long compelled to retire from the court of Octavianus to the island of Ulysses, where he afterwards resided for some time. Tiberius Claudius Nero was then in Greece. His wife and his infant son accompanied him in his flight, and they happily escaped. Tiberius the elder soon made his peace with Octavianus; he gave up his claim to the throne of Rome, and returned to Italy. For a time he was employed with Nero Claudius Drusus, and he died shortly afterwards (38 B.C.). Thus Tiberius the younger and his brother Nero Claudius Drusus became step-sons of Octavianus, who from the year 27 B.C. was Augustus.

The great talents of Tiberius were developed at a very early age. In his ninth year he delivered a public speech in honour of his father; in 29 B.C. he accompanied Octavianus in his triumph after the battle of Actium, and rode on his left side, and was put on the platform of the Palatine. For a time he assumed the toga virilis, he distinguished himself by splendid entertainments which he gave to the people. He married Vipsania Agrippina, the daughter of Agrippa, and the granddaughter of Cicero's friend T. Pomponius Atticus. She brought him a son, Drusus, and she was again with child when Tiberius was obliged to sacrifice her to the policy of Augustus, who compelled him to marry his daughter Julia, the widow of Marcellus and of Agrippa, and the mother of Octavius Caesar. For a time she lived in harmony with Julia, and had a son by her, who died young. But the scandalous conduct of Julia soon disgusted him, and he withdrew from all intimate intercourse with her.
During this time Tiberius took an active part in public affairs. He defended the interests of king Archelaus (of Judaea, or of Cappadocia), of the Trallians, and of the Thessalians: he was active in obtaining relief for the inhabitants of Laodicea, of Thyatira, and of Chios, who, having suffered from an earthquake, had implored the assistance of the senate; he pleaded against Pannus Cepio, who had conspired against Augustus, and who was condemned for high treason; and he was twice intrusted with the 'cern annone.' Tiberius made his first campaign against Parnisus in the Parthian war. He went to Asia Minor, and succeeded in restoring Tigranes to the throne of Armenia, and in forcing the Parthians to surrender the eagles which they had taken from M. Claudius. He returned to Rome in 18 a.d. Having been appointed governor of Gallia Comata, the peace of which province was troubled by disputes between the princes and by incursions of the barbarians.

In 15 a.d. he and his brother Drusus brought the Alpine nations of Rhaetia to obedience. He also put an end to the war in Pannonia, which had lasted since 18 a.d., and which he terminated by subduing the Breuci, the Scordi, and the Dalmatae, who were allied with the Pannonians. (14 a.d.) The Germani having defeated M. Iunius Brutus in 36 a.d., with the legions of 2, 3, and 6 a.d., Drusus was sent to the Rhine, and Tiberius returned to Rome, where he celebrated his first triumph. In the Rhaetian war Tiberius had shown military skill, and his one victory was all that the inhabitants, of whom the majority were killed or carried off as slaves. In memory of his victories, a monument was erected at Torba (now Monaco, in the neighbourhood of Nizza), on which he is seen riding a horse, a Delphic tripod, and the names of the barbarians were inscribed. (Plin. Hist. Nat., iii. 24.) In 13 a.d. Tiberius was appointed consul, together with P. Quintilius Varus. Meanwhile Drusus carried on the war in Germany with great success; but in 9 a.d. on his return from the battle he met the Rhine, in a self-imposed promiscuity, and he fell mortally wounded. Tiberius was there at Pavia, but as soon as he was informed of this accident, he hastened to Germany, and arrived in the camp of his brother, not on the 1st, but the 3rd of February, and he died in the same month. Tiberius led the army to Mainz (Moguntiacum). He ordered the body of his brother to be carried to Rome, and he accompanied it on foot. After discharging this pious duty, he returned to Germany. In the new war with the Germani, Tiberius at first defeated them, and transported 40,000 Sigambri from the right bank of the lower Rhine to the left bank; but he afterwards employed peaceable measures, and by negotiation he obtained more influence over them than his brother Drusus by all his victories. (Velleius, ii. 27, 28.) He left the command in Germany in 7 a.d., and returned to Rome, where he celebrated his second triumph, and he was consul for the second time in the same year.

In the height of his empire, he was respected by the army, and admired by the people; and he enjoyed the confidence of the emperor. He nevertheless suddenly abandoned his important functions, left Rome, and, without communicating his motives to anybody, retired to the island of Rhodes. So firm was his resolution to retire from public affairs, that he refused to take any nourishment for four days, in order to show his mother that her prayers and tears could not keep him any longer in Rome. Tiberius. During eight years he led a private life at Rhodes, reviving his honours, and living in the Greek style, and on terms of equality with those around him, with whom he kept up a friendly intercourse, especially Greek philosophers and poets. The Romans were surprised to see the step-by-step of their emperor retire to a distant island; and various hypotheses were raised to explain the motive of his voluntary exile. The disgusting conduct of his wife Julia was supposed to be a sufficient cause for this extraordinary resolution, but the emperor himself stopped all such charges of having formed ambitious schemes against his stepsons, Caius and Lucius Caesar, who were created "princeps plebis," and appointed successors of Augustus in the year in which Tiberius was taken to Rhodes. It seems that he was dissatisfied with the elevation of these two young men, and that there was discord between him and them; for when he afterwards wished to go back to Rome, Augustus would not allow it until Cæsar had consented, and it was also on condition that he should take no part in the government of the state. From this we may conclude that Tiberius and his mother Livilla had perhaps been intriguers; and Tiberius had perhaps been denounced to Augustus from the succession, and that he preferred a voluntary exile to a compulsory banishment, such as was inflicted by Augustus upon his own daughter Julia. But this is mere supposition, and there are no facts on which a direct trump can be laid. We know that Tiberius, when regarded to his banished wife Julia, Tiberius exhibited great delicacy, not withholding her conduct, and he prevailed Augustus to have her released, and to revive the Senate, which had been silent during her banishment. (Suetonius, Tiberius, c. 13.) At last Tiberius returned to Rome, a.d. 2 a.d. was received by the people with demonstrations of great joy. In the same year Lucius Cæsar died at Messina (Marseille), and his death was followed by that of his brother, who died in 4 a.d., This was considered a sign which he had received in the Parthian war. Augustus then adopted Tiberius as his future successor, in 4 a.d., and Tiberius in his turn was compelled by Augustus to adopt Drusus Germanicus, the son of his late brother, with whom he had been associated. Augustus also adopted M. Agrippa, and the posthumous son of Agrippa and Julia, but he did not designate him as a successor in the empire. The imperial throne was thus secured to the house of the Cæsars. In the same year Tiberius was appointed consul in Germany, and he was accompanied by the historian Velleius Paterculus, who was prefectus equitum. After having subdued the Brutiens, and renewed the alliance with the Chatti, Tiberius in 5 a.d. made a campaign against the Quadi and Marcomanni, and his flight enabled the whole north-west of Germany to acknowledge the Roman authority. In the following year (a.d. 6) he led 70,000 foot and 4000 horse against Marobodus, the king of the Marcmanni, who was saved from ruin by a ravine in the middle of the Roman army. This was an epoch-making event, and Tiberius, who intercepted the communications of the Roman army with Italy. Tiberius employed fifteen legions and an equal number of auxiliaries against these nations, and, in spite of the difficulties of every description, he quelled the outbreak within three years. This was a most perilous and dangerous because the Germani threatened to join the Pannonians, but Tiberius prevented their junction by negotiations and by the success of his arms. After having celebrated his third triumph, he was again sent against the Germani, who had slain Varus and his army of 9,000 men. Tiberius, who was accompanied by Germanicus, succeeded in preventing the Germani from invading the countries on the left bank of the Rhine, and he then celebrated his third triumph. Among his personal military talents, above all his strategic gifts, his sagacity, and his sureness of judgment, gives us a most favourable idea of him as a general. Suetonius says that, sharing in all the hardships of the common soldiers, he maintained a severe discipline, but that at the same time he customarily watched over the security and the comfort of the troops. Augustus died at Nola on his return from Naples, where he had accompanied Tiberius, who was going to conduct the war in Illiria (29th of August, a.d. 14). Augustus, who was a most virtuous man, left Tiberius his heir, after consulting his son at that critical moment in Rome. Livius concealed the emperor's death until Tiberius, who was at Lyons, was informed of it by messengers, had arrived at Nola. (Dio, Cassius, v. 30. 31.)

Tiberius became emperor in his fifty-first year, at the age of sixty, when he was already the writer of his life. He had the very stamp of greatness, firmness, and strength from habit, and when a man's character remains unaltered, until that time he was generally supposed to be a virtuous man; his virtues were imbibed with the severe gravity of his character. Among his biographers the allusion is often made to his early years. He was under Tiberius, than he was charged with crimes the most dreadful and disgusting. His former life is represented as dissimulation and hypocrisy. An example of such deception was the invention of the fake history. Sertorius, who concealed his real intentions for thirty years, and gave the real character which he thus concealed, but was at last discovered, and by a tumult and by inflating the passion and infamy to the people. He made the cardinals believe that by choosing him pope they would have put a stop to these difficulties, that would not allow him to act with every Tiberius however, except the eight years that he spent...
in Rhodes, was constantly employed in matters which, although they may not have contributed to his real disposition, he could never have practiced with success, unless his conduct had been directed by the force of his real character.

Augustus succeeded in making himself master of the republic by accumulation of wealth; the difficulties he experienced in the establishment of the empire, and the high functions of the state, Tiburius, proud and energetic, abominated even the shadow of the sovereignty of a nation which he despised. The Romans being sufficiently disposed to obedience, the only obstacles in his way were the deliberations of the Senate and the delatores, immediately upon the succession of Tiberius, Agrippa Postumus was put to death, probably by order of Tiberius (Suetonius, Tiberius, c. 22; Tacitus, Annal., i. 72.) About this time the supreme power was offered by the troops on the Lower Rhine to Germanic, who, however, refused, and the mutiny was quelled by him and by Drusus, the son of Tiberius, who commanded in Pannonia. Tiberius began by some enactments which tended to ameliorate the state of morals. He abolished the comitia for the election of the various officers of the state, and transferred the election to the senate, the members of which were subservient to him. It has been already said that Tiberius intended to destroy the last remnants of the ancient sovereignty of the Senate. He in a manner abolished the constitution by the majesty of the emperor. Tiberius had already employed the Lex Julia Majestatis to punish the authors of libels against his person (Tacitus, Annal., i. 72); and his example was followed by Tiberius, who made a law by which he punished him who, after the publication of the name of Tiberius, was suspected of having impugned the majesty of the emperor, either by deeds or by words, were prosecuted with the utmost severity. The number of the delatores, or informers, was increased to a very great extent. The police was gradually established in Rome, as well organised, and as well supported by spies, as the secret police of Napoleon. The property, honour, and life of the citizens were exposed to the most unfounded calumnies, and the streets, gardens, and theatres of the city were not saved from the vigilance of the imperial police.

The natural severity of Tiberius gradually degenerated into cruelty, and he showed symptoms of that misanthropy and that gloomy state of mind which increased with years. In the mean time Germanicus, the favourite of the army, had avenged the defeat of Varus, but Tiberius recalled him from Germany, and sent him into the East (17 a.D.). Germanicus conquered Cilicia and Commagene, and he renewed the alliance with the Parthians, but he died suddenly at Antioch, after the victory over Cilicia. Germanicus Piso, the commander in Syria, of having poisoned Germanicus by order of the emperor; but before Piso could be sent to trial, he was found dead. The son of a Praefectus Praetorio, succeeded in obtaining the confidence of the emperor (19-22 a.D.), who henceforth gradually abandoned to him the direction of public affairs, of which Seianus became the absolute master from the year 22 a.D. Drusus, the son of Tiberius, who had governed the Roman part of Germany with great ability, was poisoned by Seianus (23 a.D.), and this crime was followed by a great many others, with which it is possible that the emperor was very imperfectly acquainted. His practice was to shut himself up within his palace, and to spend time in the most revolting debauchery. After the death of Drusus, Tiberius recommended to the senate as his successor, Nero and Drusus, the sons of the unfortunate Germanicus and of Agrippina, who was still alive. In 26 a.D., Seianus had assassinated Piso, the chief of the public affairs. Tiberius followed his advice and went to Capua and Nola, until at last he fixed his residence on the island of Capreae in the Gulf of Naples. The life which he led at Capreae was a sort of monastic life.

From this time all public affairs were directed by Seianus; the emperor was inaccessible. T. Sabinus, a friend of Nero, was put to death; statues were erected to Seianus, and received divine honours. After the death of Livius, in 29 a.D., the authority of Seianus was at its height; but C. Antonius, the aged mother of Germanicus, penetrated through the barriers of Capreae, and informed the aged Tiberius that Seianus had left him only the name of emperor. She was supported by Macro, the commander of the Praetorian guard. In consequence of this information, Tiberius ordered the senate to condemn Seianus; and the senate obeyed: Seianus, his family, and his friends were put to death. Then Tiberius, after his able minister had retired from Capreae, and took up his residence at a villa near Misenum, which had formerly belonged to Lucullus. (Suetonius, Tiberius, c. 73.) On the 16th March, 37 a.D., Tiberius, who had fallen into a lethargy, and everybody believing him to be dead, Caligula, the son of Germanicus, the illegitimate son of old Tiberius, was proclaimed emperor. However Tiberius recovered, and Macro, in order to save himself and the new emperor, ordered him to be suffocated in his own bed; however, he returned from the dead, and spent a reign of twenty-three years. (Tacitus, Annal., vi. 50; Suetonius, Tiberius, c. 75.)

There is little doubt that the crimes said to have been committed during the reign of Tiberius, either by himself or by those real or supposed near to him, are too great to be true; the question is whether they are all to be imputed as crimes to Tiberius. His insanity is a fact which can hardly be doubted; a dark melancholy, disgust of life, and misanthropy, had taken possession of him, and he struggled with the idea of self-destruction often threw him into wild despair. He found consolation in the sufferings of others, and thus gave those bloody orders which he afterwards regretted. The unnatural pleasures to which he was so fond of resorting, are probably the result of his soul. It is probable that his insanity was complete when he retired to Capreae. Sometimes he had lucid intervals, in which he wrote those letters of which Suetonius gives some extracts (Tiberius, c. 67), and in which he speaks of having left letters for his son, which, in the tenth year of his reign, he was to publish, styling himself Caesar, choosing for his models Euphorion, Rhianus, and Parthenius, the author of an erotic poem which has come down to us. (Suetonius, Tiberius; Velleius Paterculus, ii., c. 94, &c.; Tacitus, Annal., lib. i.-vi.; Dion Cassius, lib. xlv.-l.xvii.; Mommsen, Gesch. der röm. Kaiserzeit, vol. i. 143; Casson, History of Tiberius has been defended by Buchholz, Philosophische Untersuchungen, vol. ii., p. 49, &c.)

TIBERIUS II., ANCIUS THRAX, FLAVIUS CONSTANTINUS, one of the greatest and most vicious emperors of the East. He was born in Thrace towards the middle of the sixth century a.D., and belonged to a rich and very distinguished family, the history of which is unknown to us. He was educated at the court of Justinian, whose son, Justin II., was his brother, and employed him in various civil and military offices. In 573 Tiberius, who was then general of the Imperial guards, commanded the army against the Avars, who were powerful north of the Save and the Danube. His letters were afterwards published by the passages of the Danube, Tiberius was surprised by the Avars and lost a battle. However, he recovered this loss, and concluded a peace, by which the possession of the important fortress of Sirmium, now Novi Sad, near its junction with the Danube, was secured to the Romans. This was one of the few advantages obtained by the Greek armies during the unfortunate reign of Justin II. Italy, which had been conquered by the Bulgars, was overrun by the Longobards; the Berber Tiberius ravaged the kingdom of Cathage, which had been taken from the Vandals; and on the Persian frontier Chosroes (Khoarev) made various conquests. Justin, feeling his incompetency, and having lost his son, looked for a co-regent, and his choice fell on Tiberius. Justin, able by his great talents of Tiberius, his amiable character, his generosity and love of justice, and his sincere piety, had won him the hearts of the nation, and the esteem of the emperor and his ministers. Justin was confirmed in his choice by his wife, the empress Sophia, who had views on this occasion harmonised with the interest of the state. Tiberius was the handomest man at the court, and it seems that Sophia intended to marry him on the death of Justin. However, this match was not acceptable to her, and she declined in his favour; and by the end of the first year, on the 7th of December, 574, in most solemn assembly of
the civil and military officers, and of the clergy under the presidency of the patriarch Eutychius, by whom Tiberius was crowned with the imperial diadem. In this assembly the emperor Justin addressed to his future successor the following remarkable speech (Theophylactus, ii. 11), which Gibbon translates thus:—You behold the ensigns of supreme power. You are about to receive them, not from my hand, but from the hand of God. Honour them, and from them you will derive honour. Respect the emperor, and the whole state rests upon respect. But these are no empty words; these were her servant. Delight not in blood, abstain from revenge, avoid those actions by which I have incurred the public hatred, and consult the experience rather than the example of your predecessor. Above all, let your heart be soft, even in this life I have been severely punished: but these servants (his ministers), who have abused my confidence and inflamed my passion, will appear with me before the tribunal of Christ. I have been dazzled by the splendour of the diadem; be thou wise and moderate; remember what you have been, remember what you are.'

To this speech of a dying sinner, Tiberius answered—'If you consent, I live; if you command, I die: may the God of heaven and earth infuse into your heart whatever I have neglected or forgotten.'

The burden of government devolved upon Tiberius, whose authority was never checked by Justin. The war with Persia prevented Tiberius from expelling the Langobards, whom he sent with three thousand troops to defeat and dispose of, and succeeded in maintaining the imperial authority in the Exarchate of Ravenna, on the Ligurian coast, in the fortified places in the Cottian Alps, in Rome, in Naples, and in the greater part of Campania and of Lucania. Tiberius entered Rome and passed through Melitene into the Longobards by sending a fleet laden with provisions (775). Some years later he concluded an alliance with the Frankish king Chilperich, who succeeded the Langobards in the north of Italy, and Tiberius succeeded in bribing several of the thirty Langobard dukes, who, after the murder of king Clepho (573-574) and during the minority of Anthanarих, imitated in Italy the Thirty Tyrants of Athens. The daughter of king Alboin and Rossamond, who had fled from him in consequence of their living at that time at Constantinople.

The most important event in the reign of Justin and Tiberius was the war with Persia. Khosrew, the king of Persia, had made extensive conquests in Asia Minor during the reign of Justin. In 575 Tiberius concluded a partial truce for three years with him, on condition that hostilities should cease except on the frontiers of Armenia, where the war was still carried on. These frontiers being easily defended on account of the great number of defiles in the Armenia mountains, Tiberius levied a strong army while Khosrew took the same precaution, and in a few weeks a small fortified places. For several centuries the Eastern empire had not seen such an army as was then raised by Tiberius. A hundred and fifty thousand men, among whom were many Teutonic and Slavonic barbarians, crossed the Bosphorus in 576, under the command of Justinian, and advanced to the relief of Theodosiopolis, the key of Armenia. Theodore, the Byzantine general, defended the fortress against the whole army of Khosrew. At the approach of Justinian the Persian king left the siege and advanced to meet the Greeks. The encounter took place near Melitene (in the district of Melitene in Armenia Minor). The Persians were routed, and many cities were burned and their retreat at the Euphrates; twenty-four elephants, loaded with the treasures of Khosrew and the spoil of his camp, were sent to Constantinople. Justinian then advanced as far as the Persian Gulf, and a peace was about to be concluded in 577; but Khosrew broke off the negotiations on account of a victory which his general Tammchosrees (Tam-khosrew) unexpectedly obtained over Justinian by surprising him in Armenia. Tiberius now recalled Justinian, and appointed his son Mauritian, who was afterwards emperor. Mauritian restored the Persian army and the sovereigns of Armenia. He spent the 5th of October next. After the funeral of Justin, when the new emperor appeared in the Hippodrome, the people became impatient to see the empress. The uncle of Justin, who was in the Hippodrome, expected to be presented to the people as emperor; but he was undeceived by the sight of Anastasia, who suddenly appeared at the side of Tiberius. In revenge, Sophonias formed a plot against Tiberius, and persuaded Justinian, the former commander in the Persian war, to have him murdered. Tiberius however was informed of this design. Justinian was arrested, and the emperor by pardoning him made him for ever his faithful friend. Sophonias was deprived of his imperial pension and palaces, and sent into Paphlagonia.

A quarrel broke out between Eutychius, the patriarch, and Gregoryius, the apocrisarius of Constantinople, who could not agree on the state of the soul after death. The Greeks were then the most disputatious people in the world about religious matters, and so it was led to serious trouble. The emperor accordingly undertook to settle this dispute. Adhering to the opinion of Gregoryius, he convinced the patriarch that he was wrong, and he persuaded him to burn a book he had written on the corporeal nature of the soul after death.

Khosrew died in 579, after a reign of forty-eight years. He had entered into negotiations with the Greeks, but his successor, Hormidas (Ormus), broke them off and resumed war against them. They committed several bloody outrages in Armenia, and the whole Persia perished of the plague. Tiberius entered Khosrew's capital, and found his life. Mauritian had a triumph in Constantinople, and on the 5th of August he was created Caesar by Tiberius, who was then out of ill-health, and who had no male issue. After having given his daughter Constancia, in marriage to Mauritian, Tiberius died on the 14th of August, 582, and, since the time of the great Theodosius, no emperor's death caused regret so universal. It is a remarkable circumstance in the reign of this emperor, that he was always provided with money both to hire his troops and to provide for his household, and was so great that the people used to say that he had an inexhaustible treasure. But all these resources did not enable him to save Italy, which may be accounted for by the policy of the Persians in Italy and other parts of the Roman empire, by the barbarian riches of the great quantities of gold and silver, which they carried to Constantinople, and the then free place in Europe. The city being the centre of the arts, and the commerce and industry of the East being very extensive, even the gold which fell into the hands of the barbarians gradually found its way into the Greek empire, where the barbarians purchased all those articles which they had not skill enough to fabricate themselves. This view is corroborated by the actions of the Greek emperors, who often paid to the barbarians, there was always a want of coin in the barbarian kingdoms. On the other hand, the Greeks having lost their martial habits, the emperors were obliged to recruit their armies amongst the barbarians. These people had been accustomed to fight against the emperors as for them; and it would have endangered the existence of the empire if too large a number had been engaged in its service. Thus Tiberius procured a sufficient army by engaging the barbarians to maintain a large army of barbarians, who would probably have joined the Longobards as soon as they had got their pay.
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writer. Tacitus calls him an Egyptian, but this only means that he was a native of Alexandria; for he was a Jew, though he afterwards adopted paganism. Nero appointed him his chief. When he succeeded Quaeshius Fadus, and he made him a Roman equestrian. In the last campaign of Corbulus against the Parthians, Tiberius Alexander

and Viminianus Annianus, the son-in-law of Corbulus, were given as hostages to king Trdatzes, who came to the Roman camp in the bay of Ceras (now the Golden Horn), between this city and the suburb of Syeae. Leontius prepared a vigorous resistance; but the courage of his soldiers and of the inhabitants was weakened by an epidemic disease, and at last Tiberius Abimarus found his way into the town by bribing some sentinels.

Abimarus assumed the name of Tiberius and was acknowledged emperor: his rival, Leontius, had his nose and his ears cut off, and was confined in a monastery. Tiberius Abimarus continued the war with the Arabs, and appointed his brother Heracleus commander-in-chief. This experienced general conquered Syria in 699 and 700, and treated the Mohammedan inhabitants most barbarously: it is said that two hundred thousand of them lost their lives by the sword of the Greeks. This war continued during 701, 702, and 703; and, although the Greeks did not recover Carthage, they obtained many signal advantages. Tiberius Abimarus had great influence in Italy, where popes were often harassed by John Platys, and afterwards by Theophylact, the Greek exarch of Ravenna.

Tiberius Abimarus lost his crown by a sudden revolution. When Leontius dethroned Justinian II., this prince had his nose cut off, and was thrown into the Euxine. Theodosius Cherson, in the present Crimea. Some years after, he fled to the khanag, or khan, of the Khazars [Tartars, Khazars], who received him respectfully, and assigned for his residence Phanagoria, in the island of Tarnarcha. [TAMAN.] The khanag, whose name was Busiris, gave him in marriage his sister Theodora; but Tiberius Abimarus bribed the khan with a large sum of gold, and Justinian was only saved by the affection of the Khazars, who did not like this extravagant and treacherous design of her brother. After enlisting with his own band the two emissaries of the khanag, Justinian rewarded the love of his wife by repudiating her and sending her back to her brother Busiris; and he fled to Terbelsis, or Terbellsis, the king of the Bulgarians. He now formed the plan of recovering his throne, and he purchased the aid of Terbelsis by promising him his daughter and a part of the imperial treasury. At the head of fifteen thousand troops, he set out for Constantinople. Tiberius Abimarus was dismayed by the sudden appearance of his rival, whose head had been promised by the khanag, and of whose escape he was yet ignorant. Justinian had still some adherents in Constantinople, who introduced his troops into the city. Tiberius, whose men had been cut off from Constanti

nople, when he was seized at Apolonia on the Pontus Euxinus (705), and Justinian ordered him, his brother Heracleus, and the deposed Leontius, who was still alive, to be dragged into the Hippodrome. Before their execution, the two usurpers were led in chains to the throne, and forced to prostrate themselves before Justinian, who had sworn not to spare one of his enemies. Planting his feet on their necks, the tyrant watched the chariot-race for more than an hour, while people repeated out the words of the Psalmist, ' Thou shalt trample on the sea, and salt it, and the lion on the dragon shall thou set thy foot.' He then gave orders to behead Tiberius, Leontius, and Heracleus. Justinian II. reigned till 711. The Greeks gave him the surname of Rhinometron, that is, ' he whose nose is cut off.' Tiberius Abimarus had two sons, Theodore and Constantine, who probably perished with their father. It is said however that Theodore, who is also called Theodotus, escaped with his father because he was an intimate friend of Ephesius and one of the leaders of the Ionomochi; but this is doubtful.

(Theophanes; Cedrenus; Zonaras; Gibbon, Decline and Fall; Le Beau, Histoire du Bas Empire.)

TIBET is the name of three great tables of Middle Asia. The name Tibet is derived from 'Thu-pho,' that is, the country of the 'Thu,' who founded an empire in Northern Tibet in the sixth century a.d. The name 'Thu-pho' has been mentioned in many foreigns, and especially by the Mongols, into Thupa, Tolub, Tobot, Vol. XXIV.—3 J
Tibet, and Tinet. The orthography Tibet was introduced by the Jesuit missionaries. Sanang Setsen, the historian of the Mongols, and the modern Chinese, write it Tibet, and the latter orthography has been adopted by Ritter. Another name of this country is 'Pue-Kos-chim,' which, according to Turner, signifies the 'snowy country in the north.' Sanang Setsen often calls it 'Gang-d'an-yul,' which signifies the 'country of the snow' in the Mongol language, but which is analogous to English Iceland.'

Our knowledge of Tibet is very imperfect. We are only acquainted with some lines of road and certain points which have been visited by travellers. The Chinese geographers have furnished very valuable notices concerning the mountains and rivers which constitute the indefinite and dread unknown to Europeans. Marco Polo visited Tibet, in the beginning of the eighteenth century (from the 17th of August, 1715, to the 18th of March, 1716) Father Desideri travelled through it, and, except of Southern Tibet, from Lhasa in the west, to H'Lassa or Lassa in the east; Father de la Penna was also in Tibet; and in our own days Turner, Moorcroft, and Gerard have visited parts of it.

Boundaries.—Tibet, in the largest sense of the word, has the following frontiers. The Bolor Mountains, a branch of the Hindu Kush, which stretches towards the north-west, in 72° 30' E. long., form the western boundary. The length of this frontier is about 87 miles. It is bounded on the south-west by the Hindu Kush, from Mount Teshigang to what is called by Moorcroft the Khu-khu-Nor, and on the north-west by the Himalayas as far as the western frontier of Nepal, a distance of about 480 miles. The southern boundaries are formed by the range of the Himalayas from the western frontier of Nepal to the boundary of Botan. The whole of this line is about 400 miles, and by the northern boundaries of Assam, Burma, and part of the Chinese province of Yunnan. This latter part, which is nearly unknown, runs in a south-eastern direction, and most probably as far as the junction of the Y-ling Ho, or Li-Tsang, with the Kincha-Kiang, in Yunnan, between 102° and 103° E. longitude. The length of this part of the frontier in a straight line between the two extremities is about 320 miles. The whole length of the southern frontier, according to a rough estimate, is 1,050 miles, but this branch forms a curve, its real length is much more. The eastern frontier of Tibet is formed by the western boundaries of the Chinese provinces of Siitchuang (Sictchuen), Shensi, and Kansu. This frontier has been fixed by the Chinese, but Europeans only know some points of it which are marked in the itineraries of the Chinese geographers. From the junction of the Y-ling Ho with the Kincha-Kiang it stretches northwards, and probably along the river Y-ling Kiang as far as the 30th degree of north latitude, then takes a north-eastern direction and stretches as far as Kiing, along a range of wild and snowy mountains, which, on some maps, are called the Yung-lung Mountains. At Kiing it takes a north-west direction, crosses the Huang-Ho, or Yellow River, and, traversing the Khor-Nor, 18° N. latitude, in Tibet, takes a north-west direction as far as a point situated in the mountains of Amegangar, in 38° 25' N. latitude, and 100° E. longitude. That part of Tibet however which lies south of the 29th degree of N. latitude, and east of the Kincha Kiang, or the boundary of Balang, was ceded to China in 1727, and is now under the immediate sovereignty of the emperor of China. The whole extent of the eastern frontiers of Tibet is at least 900 miles. We have no positive knowledge of the northern frontiers. They begin in the south-west, as far as the mountains of Ou-nut, which were traversed by F. Desideri (Nouv. Journal Asiatique, tom. vii., p. 117) on his way from Yarkand to Loh. From thence they are said to stretch south-east, along the mountains of Karkor, as far as a point situated in the mountains of Kuenlan (Oneuta, or Kulkou), in 35° N. latitude, and 85° E. longitude, across the deserts of Khor and of Katchi, or of Katche. Thence they run north-east, and east, until they reach the eastern frontier at that point which we have mentioned above, thence to 36° N. latitude, and 100° E. longitude.

The whole length of the northern frontier, including the larger bends, amounts to about 1300 miles. It is however doubted whether the extensive country of Khu-khu-Nor, in north-eastern Tibet, belongs to Tibet in the political sense; and if so, the Tibetans will not extend beyond 36° N. latitude. (Ritter, iv., p. 173.) But geographically speaking, Khu-khu-Nor belongs to Tibet. It is a very remarkable fact that the northern frontiers, as they have been here described, form a curve almost parallel to the curve of the Himalayas, although they diverge in proportion as they stretch towards the east. From this parallelism we may conclude that these northern frontiers were perhaps identical with the northern frontier of the Tibetan table-land. Thus Tibet is bounded on the west by Independent Turkistan; on the south-west and south by the British Hindustan, Nepal, Boota, and Assam; on the south-east by Assam and China; on the east by the desert of Gans and Chinese Turkistan.

Tibet, comprised between these limits, resembles an immense corncob, the handle of which is in the west between the Hindu Kush and the mountains of Karkor, the diameter extends towards the north, and the radius towards the east. It is traversed in its whole length by the upper part of the Indus. Its lower or north-western part, Indus or Khor-Nor, is also called the First Tibet, or Little Tibet, and is an independent kingdom. The upper part of it has the name of Ladakh, and is also called the Second Tibet, or Great Tibet, because it is larger than Baltistan. Sometimes the name of Little Tibet is given to the whole valley of the Hoang-Ho, that of the Khor-Nor to the second division of Tibet, and the name of Great Tibet is given to the most eastern part of it, as far as Teshigang on the Indus belongs to China. Baltistan and Ladakh have been described under the heads of Himalaya and Hindustan (see, p. 218, &c.).

Baltistan and Ladakh belong to Tibet in the most proper sense of the word. The second great division of Tibet begins in the south, near Mount Kailasa, and is an immense elevated desert, the western part of which is called Khor, and the eastern part of it Baltistan. The northern frontiers are the range of Karkor on the north; the Kuenlan range on the east, the ranges of mountains around the sources of the Kineha Kiang, the Um-Tshao, and the lake of Tengri-Nor in the east; and the mountains of Dzang and Ngazi in the south. Khor and Katchi have never been visited by Europeans. The eastern part is traversed by the great road which leads from H'Lassa to Yarkand, in Chinese Turkestan. The third great division of Tibet contains the remainder of this country, which lies east and south of Khor and Katchi.

The word 'Tibet.' is the common name of Eastern or Third Tibet, or Tibet in the proper sense of the word. Eastern Tibet is subject to China.

All that we can say about Khor and Katchi is that they are an immense table-land, some parts of which are 10,000 feet above the level of the sea, and the eastern part is not a level plain. It is a country traversed by immense mountains, which have a height varying from 3000 to 4000 feet above their base, or from 13,000 to 14,000 feet above the sea. The middle part seems to be less elevated than the boundaries, as the country contains several rivers which terminate in the table-land; and the southern eastern parts are higher than the eastern and norther parts, the direction of the greater number of these rivers is towards the east, and from the south to the north.

The aspect of the southern and eastern parts of Tibet is very different from that of Khor and Katchi. Tibet is traversed by numerous ranges of high mountains, the direction of which is from the west to the east, and from north-west to south-east. From these ranges lateral branches run out in different directions, and contain deep valleys between them. In proportion as the proportion of the altitude of the mountains increases, the breadth of the four valleys together seems not to be more than one hundred miles. But the range of the mountains of Ngazi, as Dzang diverges from the Himalayas, and the valley between them, which is traversed by the Dzargot, be
comes broader as it advances towards the east. The chain which, in the south-eastern corner of Tibet, separates the provinces of Latse and Mang-li (Moung-lan); and, since 1772, the frontiers between Tibet and China run along the foot of this chain, the summits of which are covered with eternal snow. The height of the mountain chain in Tibet is much greater than in the northern and central parts of the country, and the whole tract towards China, Nepal, and Bootan, is an immense alpine country. Sevcen valleys in the Mang-li mountains are from 10,000 to 11,000 feet above the sea. The snow, which seems to begin at 12,600 feet, and as the snow always covers an immense number of summits and whole ranges, it is evident that the number of summits which have an absolute elevation of about 12,500 feet must be very considerable. Some of them probably attain the height of 26,000 feet above the sea. The extent of the Mang-li mountains between Batangh and the Kincha-Kiang, and Tsiamo on the Lang-saun-Kiang, according to the Chinese itinerary is 1405, or 29° 10' a degree. (Ritter, iv. 201.) All this country is intersected by deep valleys and chasms. The summits of the mountains are covered with eternal snow, and the traveller crosses the chasms by means of bridges which are enveloped in the clouds. The mountains are covered over with eternal snow, and the altitude of the mountain range has been estimated at 11,000 feet; which, in the opinion of Asian geographers, is a very considerable altitude. According to the Chinese map of the emperor K'ao-shih, the 'Central Line' of Klaproth is a mountain range called Bo-Dzangbo, which enters it on the left or eastern side. After having entered the country of H'Lokba, it probably takes a southern direction, but we have no further knowledge of it. According to the Chinese map of the emperor K'ao-shih, there is a mountain range called the 'Coast Centrale' of Klaproth, a reduction, the Gabbo-dzangbo-tsau enters the Chinese province of Yunnan, and there receives the name of Lung-chuan-Kiang. As to the Om-tsu, it is another great river, there is great difference of opinion. According to the Chinese maps, the Om-tsu is formed by the junction of three rivers, the Ser-Sumbu, or Ser-tsu, in the east, the Ur-chen in the west, and the Kār-a-su, the largest river in the middle. The source of the Kār-a-su is at the southern end of Mount Tse-Mi, 10° N. lat. and 90° 1' E. long. The Om-tsu has a southeasterly course, and flows in a very deep and narrow valley, enclosed by steep rocks of an immense height; it enters the province of Yunnan in China, where it receives the Chinese name Lung-chuan-Kiang, and is called 'the river of the sun.' The latter part of its course within Tibet is unknown to European geographers. The Lang-saun-Kiang traverses almost the whole extent of eastern Tibet, from north-west to south-east, and the Dzo-chen in the east, the sources of which are situated north of the upper part of the Om-tsu, in the province of Kham, join at Tsiamo, and thus form the Lang-saun-Kiang, the direction of which is from north-west to south-east. It traverses a very large part of South-eastern Tibet, to the south of the Lang-saun-Kiang traverses a country quite unknown to Europeans. This river is also called La-chou, La-ts吗, Lo-tsan, and Lo-tsu. After having traversed Yunnan, it enters Lao, forms the frontier between Siam and Thailand, and flows into the Chinese Sea in 10° N. lat., after a course of more than 1700 miles. The sources of the Kincha-Kiang, or Yang-tse-Kiang, which traverses China from west to east, are situated between 37° and 38° N. lat., and between 95° and 97° E. long, on the table-land towards the north-western frontiers of Eastern Tibet. Its upper part is called Muru-us-su by the nomadic Mongols of that country; its middle part has the Tibetan name of Bouré-tsau; and it is only in China that it is called Kincha-Kiang. Its direction is east as far as 97° E. long. from this point to Batang the direction is south-east and south; from Batang to its junction with the Litchou (the old frontier of Tibet), it is again south-east. This latter part of the Kincha-Kiang follows the former frontier between Tibet and China. The Ya-long-Kiang is an important tributary of the Kincha-Kiang. Its sources are about 29° N. lat. and 97° 30' E. long, in the Hayan-Khara, a range of high and wild mountains stretching in a south-western direction, and the K'ang-chian-Kiang is the southern tributary to the Ya-long-Kiang in the south, and the sources of the Hoa-Ho in the north. The direction of the Ya-long-Kiang is at first south-east for about 200 miles; east of 100° E. long. it runs southward for about 300 miles; during the latter part of its course the direction is at first east, and then,
and then again south for about 100 miles. But all this is conjectural. The Hoang-Ho, or Yellow River, has its sources north of the Bayan-Khar, in the province of Sian. Only its sources and a part of its upper course are in Tibet and in Khu-Khu-Nor (Koko-Nor), the most northern and largest of the lakes, of which we have already spoken. The description of this river has been given under China. The whole country between the upper part of the Hoang-Ho in the north and in the west, the Ya-long-Kiang in the south-west, and the frontier of China in the east, or the eastern part of Tibet, with Khu-Khu-Nor, is traversed by the Ngang-kia. It is a populous and very commercial town, and distinguished by many large public buildings, especially convents, among which there is the first temple of the Buddhists. There are a number of buildings, especially for divinity. The town has walls and five fortresses.

Lakes.—The Tengri-Nor, the largest lake of Tibet, is nine days journey south of H'Lassa, and Chinese called Teshu-chin, or the Celestial Lake. This lake appears to be surrounded by high mountains and rocks covered with snow and ice. It receives the Tarku-Dzangbo, a river which comes from the west. The lake of Palte, which is situated south-west of H'Lassa, in the valley of the Dzangbo, resembles a large ditch surrounding an extensive island which fills up the middle of the lake. On the Tibetan maps it has the name of Bhuldi-Yumtso, and the Chinese call it Yar-brok-Yumtso. According to the local geographers there is a number of large islets which bear the names of Dhordze-phagh-mo, or the 'Palace of the Holy Sow,' which is said to be one of the finest in Tibet. It is said that north of this lake there is a high mountain called Khu-Khu-Nor, on the summit of which extensive ranges of high snowy Alps may be seen to the north. These are most probably the mountains which surround Lake Tengri-Nor. In the extreme north of Tibet is situated the Lake Khu-Khu-Nor, or Koko-Nor, that is, the 'Blue Mountain Lake,' which is surrounded by forests and a number of streams, to all the surrounding country. The lakes of Kailass, in the southern part of Tibet, have been described under Himalaya.

Tibet is known in India and China as a country of hunger and misery, and as such it is represented by the Mongol historian Sanah Setsen. However cold and barren the table-lands and the mountains may be, on account of their extreme elevation and of the snow which perpetually covers whole tracts, the climate of the valleys, and especially of the valley of the Dzangbo, is hot. From March to September the weather is fair, interrupted only by some showers; the winds are not regular, as in India. In H'Lassa the trees bud at the end of April and in the beginning of May. Corn and peas are sown towards the end of the spring and in the beginning of the summer; and the harvest is reaped in the months of August and September. Dew falls in the summer nights; it bats one's nose, and deep in the table-lands the climate is very different. Turner, who visited a part of them on his way from Bootan to Teshu Lumbu, gives an interesting description of it. From May to October the sky is always clear, and the sun shines with a splendour which makes the mountains glow, and the plains are bright with different kinds of flowers. From October to March they are covered with snow. The surface of the weather-beaten rocks breaks in pieces, which the air dissolves into fragments as small as dust; and clouds of this dust, raised by whirlwinds, are driven from the plains to the summits of the mountains, and from the mountains down to the houses of the inhabitants. The air is excessively dry, and its effects resemble those of the dry heat of the Sahara. The trees wither; their leaves may be ground to powder between the thumb and the first finger of the hand. The inhabitants have to cover the timbers of their houses with wet towels in order to preserve them against the destructive effects of excessive dryness. The timber never rots. The flesh of sheep exposed to the open air becomes dry, and may be ground like bread, and thus preserved during years. This flesh bread is a very common food in Tibet.

Productions.—Among the minerals there are gold, silver, copper, tin; salt, which is taken from the salt-lakes of Xigacs; asphalt; jade; turquoise, agate. Besides a great number of grasses which are common in Europe, Tibet produces a kind of grey barley, grapes in Bathang, and, near H'Lassa, ingwe, asafetida, rhubarb, madder, safflower, apples, nuts, apricots, peaches, pears, and plums. Corn grows at the valleys, and cedar grows in Tibet. Among the animals there are wild oxen with long hair, buffaloes, the buffalo which is called the yak, goats with a very fine fleece, goats with long fine hair, elk, worms, wild cats, tigers, leopards, hares, argali with horns of one hundred pounds weight, parrots, white eagles, and swans. All our domestic animals known in Tibet, and the horses are excellent. Fish are abundant in the rivers, but they are not eaten, being prohibited by the religious law.

Political Division.—1. The territory of the Dalai Lama contains the eastern and north-eastern parts of Tibet. The capital, H'Lassa or Lassa, is situated on a beautiful plain on the banks of the Dzang-tsu, near the junction with the Dzangbo. It is a populous and very commercial town, and distinguished by many large public buildings, especially convents, among which there is the first temple of the Buddhists. There are a number of buildings, especially for divinity. The town has walls and five fortresses.

2. The territory of the Teshu Lama contains the province of Dzang and Ngari, and perhaps also the countries of Kailass and of the upper course of the Ngang-kia. His residence is at the convent of Teshu-H'Lumbu, in 29° 4' N., lat. 89° 7' E., long., according to Turner, who visited this place in 1793. It was founded in 1447, on a small plain surrounded by lofty mountains; but this plain is a part of the summit of a high table-land, the environs are cold and barren, and it is said that there are only 10,000 persons, and some 8000 houses. The Teshu-H'Lumbu lies almost opposite to a pass across the Himalaya of Bootan, which is defended by the fortress of Dzadzhe-Jeung. Teshu H'Lumbu, or, more correctly, Iachi H'Lombo, contains from 300 to 400 houses, convents, temples, and palaces, surrounded by a wall, and all communicate with each other. The site of this building, where the Lama resides, has the name of Lapranga, the most remarkable part of which is the great tower or mausoleum of the Lama Teshu, 29° 8' N., lat. 89° 7' E., the residence of the Lama Teshu, or Teshu H'Lombu.

Inhabitants and History.—According to the legend Tibet was originally inhabited by animals and demons. A human being who led there the life of a hermit: his exclusive occupation was the performance of religious duties, and he was absorbed in the pursuit of the knowledge of the wondrous. When he was just on the point of attaining the objects of his pursuit, he was disturbed by the appearance of a female Mangus. The Mangus, whose Sanscrit name is Rakshas, are ugly demons, who however can adopt any figure they please. The Mangus came to the king of the monkeys had assumed a human form, and was delivered of a son. The son was born at first alleged his monastic duties, but at last he married the Mangus, and his descendants are the people of Tibet. (Schmidt, Forschungen, p. 211.) This account has been found in the religious writings, in the Pah-chu-bun, and is important to a nation which believes in the metaphysical, and is proud of its descent from a monkey, because he is one of the most cunning of animals. The first-
The history of Tibet becomes more certain from the reign of king Srongdalan-Gambo, who was born in 617, and ascended the throne in 623. He founded the town of Lhasa, where he held his residence, and he built a splendid palace on Mount Pudula. His reign is particularly remarkable for the invention, or rather introduction, of the Tibetan alphabet. Tongmi Sambahda invented this alphabet, which is only a modification of the Sanscrit alphabet; and he made the first Tibetan grammar. Srongdalan-Gambo, who is also renowned as a legislator and administrator, died in 699. His successors carried on war with China, in which they were often successful; but in 822 they were completely defeated and their capital was burned, the king Dharma, who ascended the throne in 901, Buddhism was almost destroyed, the king having adopted the Black religion, or the Islam. Buddhism again became the dominating religion after Dharma had been murdered by a priest in 925.

In the beginning of the eleventh century each of the seven grandsons of king Bilamgr-Dzang became an independent prince; and from this event dates the entire decline of the kingdom of Tibet, the power of which had been already broken by the civil troubles which accompanied the persecution of Buddhism. One of the new kings was Tangut, in the northern part of Tibet. Genghis Khan subdued all Tibet in 1260, according to Sanang Seten, but not its capital; and we can only suppose that the Tormians do not mention this fact. It is nevertheless a fact that Tibet was conquered and ravaged by the Mongols; and it was not before the end of the thirteenth century that the country recovered from the calamity of the Mongol war by the careful administration of Kublai-Khan. The easternmost parts of Tibet, which during the middle ages extended much farther to the east than they do at present, were gradually conquered by the Chinese in 1218, 1247, and 1276; and in 1366, when Tibet was incorporated with China, which has been mentioned above. Since the year 1720 all Tibet has been a vassal state of China, and Chinese garrisons are in its towns, and they watch the passes in front of the mountains; the number of troops of the two countries is given by different estimates, which in any case are of great interest to the study of Tibet. The Chinese have conquered the country, and have annexed it to their Empire, and have put the inhabitants under Chinese law.

The name of the chief priest is Lama; and the Dalai Lama is the first of them. The second is the Tushu, or Bogdo-Lama. The people are kind, tolerant, polite, and much more civilized than the Mongols, although they are generally poor. They live in a state of polyandry, that is, several men cohabit with one woman; but it is only brothers who are allowed thus to have one woman in common. Arts and literature are cultivated, but the works and the language of the Tibetans are almost unknown in the outside world. The letters of the Tibetan, Chinese, Mongol, and Turkestan, are written in the same direction, and in the same order.

The Tibetans are of great importance to the commerce of the world, and the Chinese and Europeans have been very interested in the study of their language, and in the collection of information about the country. The Tibetans have a great number of government officials, and many of them are employed on the staffs of the army.
the other poems in this book, almost all bear traces of being the genuine works of Tibullus.

The elegies of Tibullus are chiefly of an amatory kind. In the earlier period of his life Della seems to have been his favourite, and afterwards Nemesis, and their names occur most frequently in his poems. Several of his elegies are devoted more or less to celebrating the praises of his patron Messalla, but these are the least pleasing parts of his works, for he does not appear to have excelled in panegyric.

Tibullus is placed by Quintilian at the head of the Roman elegiac poets (Fast. Orat., x. 1). His poems are distinguished by great tenderness of feeling, which sometimes approaches to effeminity, but they are the same time excite our warmest sympathies. He seems to have been of a melancholy temperament, and to have looked at things from a gloomy point of view; hence we find the subject of death frequently introduced, and the enjoyment of the present interrupted by dark forebodings of the future. He constantly describes the pleasures of a country-life and the beauties of nature, for which he had the most exquisite relish; and there is in those descriptions a naturalness and truthfulness which place him above his contemporary Propertius. His style too is not of the artificial character which distinguishes the elegies of Propertius; and his subjects are not, like the latter, mere imitations or translations of the Greek poets, but essentially original works.

Tibullus was formerly edited together with Catullus and Propertius, the earlier editions of which are mentioned under Propertius. The principal separate editions are by Heyne, 1777, 8vo., often reprinted, of which the fourth edition, containing the notes of Wunderlich and Dissen, appeared in 1817-19, 2 vols. 8vo., Leipz., J. H. Voss (Heidelberg, 1811, 8vo.), Bach (Leipz., 1819, 8vo.), Goldschmidt (Paris, 1826, 8vo.), Lachmann (Berlin, 1829, 8vo.), and Dissen (Göttingen, 1835, 2 vols. 8vo), of which the last two contain the best text.

Tibullus has been translated into English by Dort (1720), and Grange (1779). A modern German translation is by J. H. Voss (Tübingen, 1810, Günther, Leipz., 1825), and Richter (Magdeburg, 1831). There are also French and Italian translations.

Respecting the life of Tibullus and the Roman elegy in general, the reader may consult with advantage Gruppe's Die Römische Elegie, Leipz., 1838.

TIBUR. [TIVOLI.]

TIC DOULOUERUX. [NERLAUDIA.]

TICHEIELD. [TITCHFIELD.]

TICINO. [CASSINERIA vol. viii., p. 147.] Mr. Swainson places the genus in the subfamily Troglodytinae, {family Cercithidae}. (Classification of Birds.)

Mr. G. R. Gray arranges it under the subfamily Cercithinae, between Cimiciteris, Temna, and Geobates, Sw. (List of the Genera of Birds.)

TICINO, CANTON OF (Tessin, in French and German), one of the cantons of the Swiss Confederation, is situated south of the Leponline and Rhaetian Alps, and the surface slopes towards and merges in the great plain of Lombardy. It is the only Italian canton in the Confederation; and the inhabitants speak a Lombard dialect resembling the Milanese, and are Italian in their habits and manners; they are all Roman Catholics. The canton takes its name from the river Ticino, which flows through the great central group of the St. Gotard, flows southward along the Val Leventina, passes by Bellinzona, and then enters the Lake Maggiore at its northern extremity, and issues out of it at the opposite end by the town of Sondrio in Lombardy. [Po. Bann of.] The canton is very mountainous, being intersected by several offsets from the great chain of the Leponline and Rhaetian Alps. A number of valleys, large and small, lie between these offsets, the largest being the valley of Ticino itself, parallel to the river, and sloping towards the south. The principal valleys are—1, the Val Leventina, already mentioned, called Livinen Thal in German, which runs in a southern direction through the centre of the canton. East of the Val Leventina are—2, the Val Varennva, which is the continuation of the Val Verzasca, being to the canton of the Grisons; 3, the Val Morobbia, which slopes down from the Idrío Ber on the frontiers of Valtellina, and the water-drain of which falls into Ticino below Bellinzona. West of the Ticino are—4, the Val Ocana, one of the largest in the canton, which in its lower part is called Val Lavizzara; it is drained by the river Maggia, a rapid Alpine stream, which enters the Lake Maggiore near Locarno; 6, the Val Verzasca, which lies between the districts of the Val Latina and the Val Viscontea, which runs parallel to them, but is not so large as either: 7 and 8, the Val d'Ostenone and the Centovalli, west of the Val Maggiore, which they both join at its lower end near the Lake Maggiore.

A branch of the Ticino called Monte Cenerone runs across the southern part of the canton of Ticino from north-east to south-east. It detaches itself from the Idrí Ber, and runs to the east bank of the Lake Maggiore. South of this ridge lies the basin of the lake of Lugano, which is thus separated from the rest of the country by the Ticino, which runs into the Lake Maggiore. The lake of Lugano is situated on the southern part of the canton, consisting of the district of Mendrisio and the circle of Ceresio, which form part of the district of Lugano, from the rest of the canton, which lies north of the lake.

The northern extremity of the Lake Maggiore belongs to the canton of Ticino. [LAGO MAGGIORE!]

The name of Ticino is bounded on the north by the Lake of Maggiore, 23,000, as to the Alps and mountains. There are—1, the Alps, which comprise the highest range of mountains in Europe, the Va, climbing, and lemon-trees thrive in some favoured spots. 2, the region of the chestnut, the vine, and cherry-tree, which rises about 1000 feet higher. 3, the region of the fir-tree, which rises to about 4000 feet above the level of the lake. 4, The Alpine pastures, which reach as high as 6000 feet. 5, The region of perpetual snow, which separates these pastures from the subalpine level. There is consequently a great variety of climate as well as of productions in the canton, but the people are not generally speaking, as industrious as they might be. The chief crops are—1, wheat, amount to about 20,000,000 bushels, 2, grapes, 25,000, goats to 75,000, and pigs to 27,000. The number of horses and mules is about 2000. Wolves and bears are hunted in the mountains. The rivers and lakes abound with fish. The principal articles of export are cattle, cheese, wine and fruits, hay, hides, and marble from the numerous quarries. Corn is imported from Lombardy. The manufactures are of no very great importance; they consist chiefly of coarse cloth, leather, plastered straw, and tobacco.

The silkworm is reared in some localities.

The population of Ticino increased from 1833 to 1838.

The area is computed at about 1100 square miles. Several thousand people emigrate every year to work in other countries, as masons, porters, glaziers, chocolate-makers, and sellers of barometers. Many of them return home after a year or two, bringing with them considerable sums of money.

The canton is divided into eight districts, which are subdivided into circles. The districts are—1, Val Verzasca, the northernmost part of the canton, lying at the Idrí Ber, and dividing the Ticino from the Maggia; 2, the Val Varennva, situated above the Ticino valley, and parallel to the Ticino river; 3, Locarno, at the northern extremity of the Lake Maggiore; 4, Val Maggia; 5, Val Bregio or Blesio; 6, Riviera, on the eastern side of the Lake Maggiore; 7, Lugano, which stretches on both banks of the Lake of Lugano, and where the same name appears, and 8, Brissago, which lies upon the lowland of Lombardy. The principal towns are—1, Lugano, a pretty-looking thriving town on the northwest bank of the lake of the same name, in a lovely situation, enjoying an Italian climate, has some fine churches.
with paintings by Lavrin, a pupil of Leonardo da Vinci, some large mansions or palaces, as they are called in Italy, and in Switzerland. There are several silk plants, tobacco, leather, and iron and copper works, and 4500 inhabitants. There are at Lugano many merchants, it being one of the great high roads between Switzerland and Italy. The town, however, is held in the month of September attended. Lugano has an alleged direction of the Fathers Somaschi, which is attended by more than one hundred pupils, several elementary schools, a school of drawing, a reading-room, and three newspapers in the Italian, French, and German language. There are numerous churches, with vines, olives, and other southern trees, and full of country-houses. 1. Bellinzona, a walled town situated in the valley of the Ticino, on the high road of the St. Gothard, has a very fine church, an college, an arsenal, and about 11,000 inhabitants. There are several ruined castles of the middle ages in the neighbourhood. 3. Locarno, a small town with a fort on the Lake Maggiore, in a romantic situation, has several churches worthy of notice, a castle, which now the government-house, and about 1700 inhabitants. It was once a thriving town with 5000 inhabitants, but many of the principal families, being banished about the middle of the sixteenth century, for having embraced the doctrines of the Reformation, carried away with them her goods and art treasures, but Locarno has never since recovered from the blow. The families of Orelli and Muralt, long established at Zürich, were originally from Locarno. 4. Mendrisio, a town of 1700 inhabitants, in a fertile country, and on the high road to the north. The capital of this canton is of churches and convents, a printing-press, and some silk manufactories. 5. Capolago, at the southern extremity of the lake of Lugano, known for its printing-press, where many are printed to avoid the censorship of the government of Italy.

The valleys and highlands of which the canton of Ticino consists were inhabited in the ante-Roman times by the Lepontii and other aboriginal tribes of mountaineers, who were finally subdued by the Romans. After the fall of the empire, the Longobards spread their dominion over the country. After several more vices of the succeeding centuries, we find the country partly under the dominion of the Visconti, dukes of Milan, and partly under the feudal barons of Sax and other Rhéscan lords, till the fifteenth century, when the Swiss of the Forest cantons conquered the Val Leventina, and soon after acquired Bellinzona and the country north of Mount Cenera by a formal cession from the barons. In the beginning of the sixteenth century, the Swiss obtained possession of Locarno, Lugano, and the rest of the country, which they formed into several Landvogteien, or bailiwicks, some of which were under the exclusive possession of the Republic of Switzerland; and Popes. The people of Locarno stood firm to their Swiss connection and repulsed the Cisalpine republic, and took from them several standards, which are still seen in the church of San Lorenzo of Lugano. The distinction between sovereignty and subject states having at the same time disappeared from Switzerland, the whole district was united into one canton of the new Swiss confederation by the name of Ticino, and as such it was acknowledged by Bonaparte in his Act of Mediation, and afterwards by the allied powers in 1814. In June, 1830, the canton of Ticino changed its constitution and adopted one by which the franchise is given to all natives of the canton not younger than twenty-five years, and who are burgesses of a commune and of its representation, and by which the vote is divided amongst the value of at least 300 francs. The qualification required for members of the great Council is four thousand francs. The Great Council, or legislature, consists of 114 members, elected for four years, and amongst them is the constitution of the Little Council, of Executive, as well as the judges of the various courts. In ecclesiastical matters the canton of Ticino depends partly on the bishop of Como and partly on the archbishop of Milan. The public revenue amounts to about 800,000 francs, derived chiefly from customs, stamps, salt monopoly, and other taxes. There is a public debt of about four millions of francs. New codes have been adopted, and what remains to be done is to have the proper administration of justice in the canton, where venality, corruption, and infractions of the laws are evils of antient date, and still of not infrequent occurrence. The standard of the intellectual and moral condition of the people in general is higher than that of the population of most other cantons of Switzerland. Yet the canton of Ticino has produced several distinguished men in various branches, such as Professor Soave, the Abbé Fontana, Francisci, who is still living, the earl of Montagna, Borromini, Madame, Albertoli, and Bianchi, several sculptors and painters, several members of the family of Quadri, one of the principal families in the canton, and others. The people of Ticino are not deficient in intelligence, but they want instruction.

(Teresche, Dictionnaire Geographique Statistique de la Suisse; Francisci, Statistica della Svizzera, and his more especial description of his native canton.)

TICINO, River, Italy [wink]

TICKELL, THOMAS, an English poet of unblemished mediocrity. He was born in 1686, at Bridgikirk in Cumberland. He was sent to Queen's College, Oxford, and he took his degree of Master of Arts in 1708. Two years afterwards he joined the army of his country, and not complying with the statutes by taking orders, he obtained a dispensation from the crown for holding his fellowship, till he vacated it by marrying in 1726.

His praises of Addison were so acceptable that they procured him the whole of that " honour which intimated him," says Johnson, into public affairs." When the queen was negotiating with France, Tickell published The Prospect of Peace, in which he raised his voice to reclaim the nation from the pride of conquest to the pleasures of tranquillity. This, owing perhaps to Addison's friendly praises of it in 'The Spectator,' had a rapid sale, and six editions were speedily exhausted.

On the arrival of King George I. Tickell wrote 'The Royal Progress,' and 'To the Prince.' He was printed in 'The Spectator.' Johnson says of it that 'it is neither high nor low,' a very equivocal criticism, considering Johnson's habitual taste.

The translation of the first book of the 'Iliad' was the most important thing in Tickell's poetical career, having been published in opposition to Pope's; both appeared at the same time. Addison declared that the rival versions were both excellent, but that Tickell's was the best that was ever made. This praise causes surprise to us when we find strong and often bitter abuse against Tickell as a translator, as Pope, Young, and Warburton asserted. Dr. Johnson says, 'To compare the two translations would be tedious; the palm is now universally given to Pope. But I think the first lines of Tickell's were rather to be preferred. Addison seems to have borrowed something from them in connection with his own.'

During the dispute on the Hanoverian succession Tickell assisted the royal cause with his 'Letter to Avignon,' of which five editions were sold. Addison now employed him in important public business, and when, in 1717, he himself rose to be secretary of state, he made Tickell under secretary. On Addison's death, Tickell published his works, to which he prefixed an elegy on the author, which, Johnson pronounces to be equal to any funeral poem for subtlety and elegance in the English language. Considering that we have the 'Eyelids' of Milton, this sounds oddly: on turning to this elegy, we are forced to admit, with Steele, that it is only 'prose in rhyme,' and very bad prose too. Such lines—

'Her eyes did equally the sudden tears
indicate the substitution of sound for sense, which writers like Tickell delight in. He never asked himself whether it was his eyelids that were dim or whether tears glanced: all he knew was that dim, eyelids, glance, tears, were common poetical phrases, and therefore suited his purpose. In 1729 Tickell was made secretary to the Lords Justices of Ireland, a post which he continued till his death, on the 23rd April, 1740.

(Johnson's Lives of the Poets; Campbell's Specimens of British Poets.)

TICKEREL.[Yorkshire.]

TICUNDEROGA. [New York.]
TID 432

TICOZZI, STEFANO, born in 1762, in the Val Bassina, in the province of Como, studied at Milan, and afterwards at Pavia, took priest's orders in 1782, and was appointed a country parish near Lecco, in his native province. When the French invaded Lombardy in 1796, he and his brother Cesare Francesco, who was an advocate, advocated the revolutionary movement; but when the Austrians took Milan in 1797, he was obliged to emigrate into France, and his brother was seized and sent prisoner to Cattaro. Ticozzi returned with the victorious French in the following year, and was appointed to several political offices under the Italian republic; in 1801, he was elected a deputy to the Plan of the Plenipotentiaries of Napoleon's administration. In 1810 he published some disquisitions on monastic institutions: *Degli Istituti Clarissimi Dialoghi Tre,* 8vo., Belluno. He lost his situation on the fall of Napoleon, and retired to Milan, where he lived mainly by literary labour. He translated into Italian Sismani's *History of the Italian Republics,* Llorente's *History of the Inquisition,* Agincourt's *History of the Arts,* and other works. In 1818 he published his *Dizionario dei Pintori del Rinascimento,* a work of 12mo., in which he afterwards merged in his larger work, *Dizionario degli Architetti, Scultori, Pittori, Intagliatori in Rame e in Pietra,* his main object being to preserve a tolerably equal degree of immorality, or a uniform head of water to act upon its float-boats; and a fourth the axle of the wheel is permanently fixed a level, and moves in it as is required, whether partially or completely immersed in the water. Of these conditions it is observed that the first and that have been usually exemplified in one machine, and that the second and fourth may readily be united in another. Dr. Gregory therefore treats of tide-mills, which are as follows:—1. Tide-mills in which the water-wheel rises and falls, and turns one way with the rising tide, and the contrary when it ebbs; and, 2. Tide-mills in which the axle of the water-wheel remains nor falls, and in which the wheel is made always to revolve in the same direction. Of the first of these varieties of tide-mill a good example is given from a corn-mill erected on the bank of the Thames near East Greenwich, which is sufficiently explained by Gregory, and also by Professor Barlow, in his *Treatise on Manuf actures and Machinery* in the *Encyclopedia Metropolitana,* but the essential features of the contrivance may be briefly described from the description given by Mr. Novello della Carrara, Signore di Padova, and of Taddesse d'Asta, its consort, a diverse parti d'Europa; 2 vols. 8vo., a work also illustrative of the same period; 3. a continuation of Corniani's biographical work, *I Seioli della Letteratura Italiana,* down to our own time, and also a continuation of Bottari's collection of letters concerning the arts: *Raccolta di Lettere sulla Pittura, Scultura, ed Architettura,* scritti da più celebri Personaggi degli Secoli xv., xvi., e xvii., continuata fino ad rimaneggiare back in 1810, vol. 8 vols. 8vo., the last volume of Verri's *History of Milan,* a copious and correct account of the river, to which the rising tide enters a river, which covers the whole of Lombardy, and that the reservoir beyond the principal one affords the means for cleansing the whole apparatus by flushing, or scowling, or low-water. The water-wheel is a cylinder twenty-six feet high, and six feet broad, having a number of paddles, being divided into four divisions, and likewise a divided paddle-wheel described under *Milli.* In the same volume, p. 599, in order to equalize the action of the water; and its axis is laid in a position parallel to the axis of the river, so that it may be turned with equal facility by a stream flowing from the river into the reservoir, or by the reservoir into the river, according to the direction in which the tide is moving, and the positions of the sluices for admitting the head of water on one side, and allowing it to run off on the other. The water-wheel is in a fall-water of more than 200 feet, the water is conveyed to the reservoir of the water-wheel, fixed upon the same axis, a large bevel-wheel, from which the rotary motion is communicated to an upshaft, by means of two small horizontal wheels, can be turned by a man, either with or without the aid of another person, being turned to connections into which the wheel, while the other revolves freely, without coming in contact with it. Thus, by throwing the upper water into one while the water-wheel revolves in one direction, and the lower one when its motion is reversed, the vertical shaft is made to revolve continually in one direction. The water-wheel, and the parts immediately connected with it, forming an apparatus of the weight of nearly twenty tons, are so mounted as to rise and fall by the action of the water with very little attention; the bottom of the wheel being connected with a kind of horizontal folding-door which prevents any communication between the river and the reservoir, excepting in the required direction, whatever may be the position of the wheel-frame. The motion of these vertical shafts is communicated to the horizontal, as the mill by large horizontal wheels which turn with the shafts, but do not rise and fall with them. The weight of these horizontal wheels is supported by a series of trellises which are used in connection with the water-wheel, so that the vertical shafts, which are squared to fit the men, may slide freely up and down, although they cannot two round without turning the wheels. Of the means for effecting the objects required in the second of the above-mentioned varieties of tide-mills, a very slight notice will suffice. Belidor describes a water-wheel contrived by M. Gosset and De la Dauco, in which the float-boats are hinged in such a manner that, while at the bottom of the wheel, they would press against
the railli or arms of the wheel, and would present their full surface to the action of the current, while in any other position they would, by turning on their hinges, present little more than their edges to it. Such a wheel will revolve with great velocity; but, all things considered, the water-wheel would be quite stationary. Gregory describes also a bucket-wheel invented by Mr. Dryden, which will work with nearly equal force, whether the head of water be within one or two feet of the top, or above the top, or below the level of the water; and also a wheel in which the tail-water is above the level of the axle, or the tail-water level with the bottom of the wheel, and the head at a proportionate elevation, but below the level of the axle. The float, or divisions between the buckets, are all set at one and the same distance from the axle, and the distance is left between each float and the drum, or of ling, of the wheel, to allow to enter the buckets freely as they rise out of the water, and thereby to prevent the loss of power occasioned by the formation of a partial vacuum in the buckets, causing it, in the language of the miller, to suck up the tail-water. The uniform rotation of the wheel in one direction must be provided for by having two passages, provided with sluices, from each end of the water-way in which the wheel is placed; one passage leading to the river, and the other to the reservoir. By opening and closing the sluices alternately, the current, whether from the river to the reservoir or from the reservoir to the river, may always be made to pass in one direction, and, with the same accuracy as that, by M. Dusseausmy, an officer of artillery. A work by Al- dini on the tide as a moving-power for mills was published early in the present century.

TIDEMAN, PHILIP, was a native of Nuremberg, where he was born in the year 1597. He studied first under a painter named Nicholas Raes, with whom he remained eight years, and was distinguished by his diligent applica- tion to his art, in which he attained great proficiency. Desiring an education and a knowledge of the sciences, he went to Amsterdam to study the capital works of the great masters in the collections in that city. Lairesse being at that time in great esteem at Amster- dam, Tideman resolved to place himself under his direc- tion; and so gained the good opinion of his teacher by his pleasing manners and his talents, that Lairesse conceived a great affection for him, and not only gave him the best instruction in the art, but employed him to assist in some important works on which he was engaged, and executing these works with admirable spirit and diligence, he obtained a considerable part of the work. Thus Tideman, who had long been his foster child, left him and proceeded to England, where he was received with the utmost politeness by Mr. Dusseausmy, an officer of artillery. A work by Al- dini on the tide as a moving-power for mills was published early in the present century.

TIDEB. [WAVNE.]

TIDEWELL, DERBYSHIRE.

TIDORE, one of the Moluccas, is situated in the strait which divides the island of Gilolo from that of Celebes, and is traversed by 49° N. lat., and by 127° E. long. It is only about 21 miles in circumference. Near the southern coast rises a mountain in the form of a cone, which is of volcanic origin. According to an estimate its summit may be about 4000 feet above the sea. This mountain, which is covered with volcanic matter mixed with a considerable portion of vegetable mould, and abundantly watered by nu- merous rivulets which descend from the mountain: it is of great fertility, well cultivated, and produces rice in abundance. When he returned to his native land, the same tree, grow wild, though the Dutch have been at great pains to extirpate the trees, to secure the monopoly in spices. The island is very populous, and governed by a sultan, who also possesses the southern and middle portions of Gilolo—his chief towns being Maba-Wida, and Patang petong to him. He claims also the islands which are situated between Gilolo and Papua, namely, Wagesoe, Battanta, and Mysole, and lives in great state. The in- habitants are Malays and Mohammedans. At the time of the Dutch's visit (1774) there were twenty-five mosques on the island.

This island was first visited by the vessels with which Mag- guhans sailed round the globe in 1521, and the Spaniards valued its valuable spaces. They returned five years after, and found that the Portuguese had begun to establish their authority on the Moluccas. This gave rise to a war be- tween the Spaniards and Portuguese, which ended, in 1529, by the emperor Charles V. renouncing his rights to the offices, etc., which he had acquired from the king of Portugal; and for default of an equivalent sum of 350,000 ducats. Tidore was visited by Sir Francis Drake in 1579. In 1613 the Dutch took all the Por- tuguese settlements on these islands, and began to subject their sovereigns to a more strict obedience for the purpose of establishing their monopoly in the spice trade. They detained them for some time with great harshness. In 1778 the sultan of Tidore was dethroned and exiled to Batavia, but he was afterwards re-established. In 1766, when the British took Ambonya under Admiral Rainer, Tidore, being dependent on its government, fell also into their power: it was re- stored by the peace of 1801. In 1808 the sultan of Tidore, disagreeing with the Dutch at Ambonya, was expelled and obliged to fly to Papua. He applied to the English for assistance, and went to England, where he was received by M. Dusseausmy, an officer of artillery. A work by Al- dini on the tide as a moving-power for mills was published early in the present century.

(Forrest's Voyage to New Guinea and the Moluccas; Stavrov, Voyages to the East Indies.)

TIEDERMANN, DIETRICH, a German philosopher, was born the 3rd of April, 1748, at Bremervörde, near Bremen, where his father was burgomaster. He received his early education at Halle, and was for some time a pupil of Boeckh's. On the death of his master, his father having again taken possession of Ambonya, the sultan of Tidore became dependent on them; but in 1814 all the settlements of the English were abandoned, and the English had been taken by the English, were again restored to the Dutch, and the sultan of Tidore is now dependent on the Dutch government.

(Forrest's Voyage to New Guinea and the Moluccas; Stavrov, Voyages to the East Indies.)
TIE 434 TIE

derived from this institution and from private instruction, together with what he got by writing, enabled him to live in comparative comfort. He then took up the study of philosophy, appeared under the title of 'System der Stoischen Philosophie,' Leipzig, 1776, 8vo., with a preface by Heyne, who had recommended the publication. In this year Heyne was applied to in order to recommend a competent successor for the public lectures he had discontinued; and Tiedemann was selected in Cassel. Heyne recommended Tiedemann, and accepted the place for him without telling him of it. Tiedemann was delighted with the place, as it did not occupy too much of his time, and put him in connection with some of the most distinguished men in Germany; besides, the study of philosophy and its history was now prosecuted with fresh zeal and vigour. The philosophical views which he had imbibed from the authors whom he had most studied tended towards scepticism, but his freethoughts venerated and counteracted them, and at length succeeded in turning his mind in a different direction. In the year 1786, when the Carolinum was broken up, Tiedemann was transferred with the other professors to Marburg. Here he lectured at different times on logic, metaphysics, the law of nature, on moral philosophy, psychology, universal history, history of philosophy, and sometimes also on some classical Greek writer. His lectures were very popular, and his kind disposition made his hearers look upon him more as a friend than as a teacher. This momentous period of his life, he devoted himself to the calmness and dignity of a philosopher in combating the philosophy of Kant, to which he was opposed. He died in 1836, without undertaking, after a short illness, on the 24th of May, 1833.

Tiedemann was beloved and esteemed by all who knew him. His life was spent in intellectual occupations and bodily exercise, of which he was very fond. His striking qualities were great self-control, cheerfulness, and a total absence of all pretension to literary superiority, although his works were extremely popular. Besides the works already mentioned, the following deserve notice:—Unterricht den Menschenwesen, Leipzig, 1777, 8vo.; Gesellschaften, 3 vols. 8vo.; Griechenland erste Philosophen, oder Leben und Systeme des Orpheus, Thales, and Pythagoras, Leipzig, 1790, 8vo.; Hermes Trianaegis Poemander, oder von der gotthlichen Macht und Weisheit, Berlin and Stuttgart, 1791, 8vo. This work is a translation from the Greek of Hermes Trianaegius. 'Geist der Spezulativus Philosphie,' Marburg, 1791-97, 6 vols. 8vo. This work is a history of philosophy from the time of Thales down to Leibnitz and Christian Wolff; and is still useful as showing the conditions in which the arrangement is deficient, and the author did not possess that critical and profound knowledge of philosophy which would have enabled him to perceive the organic connection of the various epochs and states of the philosophical systems. 'Thesetet, oder über das menschliche Wissen,' Frankfurt, 1794, 8vo.; 'Handbuch der Psychologie,' this work was edited after the author's death (Leipzig, 1804, 8vo.) by L. Wachter, who has prefixed to it a biographical memoir of Tiedemann. Besides the greater works Tiedemann wrote numerous smaller treatises and made many translations from the French: he also contributed papers to several periodicals. He is the author of some Latin dissertations, among which we may mention three programs: 'De Antiquis quaedam Musei Fasti, dericiandia Simulacris,' Cassel, 1778-80, 4to.; 'Dialogorum in Platonis Argumenta exposita et illustrata,' Bippont, 1785, 8vo.; 'Disertatio de Quaestionibus: quae fuerit atium mag- cereium orum, quoquod ilia ab Aiaeus populis ad Urani toman atque Romanos et ab eo ad caeteras gentes sint propa-
galae,' &c., Marburg, 1787, 4to.

(L. Wachter's Memoir of Tiedemann, in his Handbuch der Psychologie, Gresser, Memoria Diericis Tiedemani, Marburg, 1833, 4to. and Journal fur Den Deutschen Dichter und Prosisten, vol. v., p. 76-86.)

TIEDE, CHRISTOPH AUGUST, 'The Nestor of German Poetry,' and one who has now taken his place as the 'father of German philology,' was born at Altmack, Dec. 14th, 1752. His early prospects were by no means flattering, for the death of his father (Consector at the Magdeburg gymnasium), in 1772, left him and a family of younger children in a very destitute situation. He completed however his legal studies at Halle; but notwithstanding the favourable opinion his talents had acquired for him, he soon abandoned the profession for which he had prepared himself, and, in 1778, accepted the situation of editor of the 'Guttenherz,' published in Hohenstein. The choice he had made proved a fortunate one, since it eventually led to connections and friendships that proved very advantageous. The immediate result of the course he had adopted was an intimacy with Gingold, Carl, and the Contoulers, including the Baroness von der Recke. The friendships thus formed, laid the foundation of the prosperous and un- ruffled tenour of his after-life. On quitting Elich he was invited by Gleim to reside with him. He, however, continued his residence until 1784, when he became private secretary to Domherr von Stedem; and though he died in the following year, Tiede remained in the family upon the same footing during the life of Madame von Madon, who, to use his own words, 'tired of the author's very competency. Being thus placed perfectly at ease in his circumstances, he travelled through the north of Germany, and visited Berlin, where it was his good fortune again to meet with Madame von der Recke, and the intimacy thus resumed continued for life, though not in accordance with the ordinary usages of society, it was entirely free from the slightest suspicion of impropriety, and no more open to it than was the similar domestication of Cowper with Mrs. Unwin. This union, of a kind, was at first looked upon with universal estimation; for it was that of two noble and pure minds, congenial in their tastes, and equally inspired with a feeling for poetry and those passions which, while they refine, also elevate our nature. The author, who thus far had been known to the world as the author of the 'Task,' for although very different in form, the first-mentioned poem is, like the other, deeply tinged by religious sentiment; and its merits were more immediately recognised, for it went through several editions within a very short time from its first appearance in 1801.

In 1804 Tiede and his female friend visited Italy, who remained there about two years; and of this journey he wrote a volume of poems, which was also published by himself, 'Tagebuch einer Reise,' &c. 4 vols. 8vo., with a preface and notes by Gotticher, which, besides being very superior to the general class of tour-books, afforded evidence of her being a zealous though candid Protestant, and a woman of strict piety. On their return to Germany, Madame von der Recke made Berlin, and afterwards 1832 Dresden, her chief place of residence, passing the summer months at Teplitz or Carlsbad. The only change Tiede henceforth experienced was that occasioned by the loss of his devoted friend and patroness. He then retired to a hermitage which, though small, was far more perfect than that her death (1833) should cause no change whatever in his outward circumstances, not even that of his residence, as she directed that her establishment should be kept up for him as before, and that he should continue in the custody and comfort of the veryDomestication of Cowper with Mrs. Unwin. This union, of a kind, was at first looked upon with universal estimation; for it was that of two noble and pure minds, congenial in their tastes, and equally inspired with a feeling for poetry and those passions which, while they refine, also elevate our nature. The author, who thus far had been known to the world as the author of the 'Task,' for although very different in form, the first-mentioned poem is, like the other, deeply tinged by religious sentiment; and its merits were more immediately recognised, for it went through several editions within a very short time from its first appearance in 1801.

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another to make some provision in their declining years for meritorious writers who may have fallen into adversity in consequence of age and infirmities.

(Conversations Lexicon; Wolf's Encyclopädie; Mon- 

 relatives, small as it is, he was engaged by an Italian artist, and painted his first picture in the smallest of the hotel's art-pieces. He was afterwards invited by Charles III. of Spain, where, in Madrid, he painted the ceiling of the salon in the new palace of the king, and the hall of the opera house. He became celebrated for his landscapes, and the melange of Oury: he executed also the chief altar-piece in oil for the convent church of St. Paschal, at Aranjuez. He died in Madrid in 1798 or 1799.

Tiepolo's style was slight and brilliant, yet his colouring was masterly, ordering and shading produced by a recourse to bright colours, but by a judicious contrast of tints: his drawing was however feeble, yet his weakness was nearly concealed by the gracefulness of his attitudes. One of his best pictures in oil is the Mar- 

 Ouri, of which there is a copy in the National Gallery of London. He etched several plates in a very free and spirited manner. He left two sons, Giovanni Domenico and Lorenzo, who were both painters: the elder etched some of his figures: the effect of his pen is not produ- 

 (Zanetti, Della Pittura Venetiana, &c.; Lanzi, Storia Pictorica, &c.; Florillo, Geschichte der Malerei, vol. ii.)

TIEF, or TIEFLIS, the capital of the Russian province of Georgia, is in about 41° 43' N. lat., according to Capt. Montell. In 1829 Mr. Fedorof, who accompanied Pro- 

 of the town. The house is one of dark and barren hills, whose high and cavernous sides gloomily overshadow it. Every house, every building within its walls, seems to share the dismal hue of the surrounding heights; for a deep blackness rests on all. The heavy battlements above, and the still majestic towers of the citadel, the wall, 1100 feet above the level of the Black Sea, and 31 feet above the mean 

 The town is built on both sides of the river; but the larger portion, which is on the right or west bank, contains houses of the wealthiest inhabitants, the great bazar, where all sorts of merchandise are sold, the military garrison, and the convent of the nuns. This is the city properly so called, which gain is divided into two parts, the old and new town. The limits of the old town are distinctly marked by the ruins of the ancient fortifications. The town extends to the sea from these, and is washed by the sea. The new town is built on a hill. It is a suburb of the city, the bed of which is generally quite dry, except immediately after rain.

There are in Tiflis 15 Greek churches, 20 Armenian, and 2 Roman Catholic, some of which are very handsome. At the foot of the hill, where the town is built, there is a long church, hemmed in by rocks, a bridge of a single arch connects the town with the suburb of Aplavlar. Here also are the ruins of an ancient fort, church, and houses, and about two miles farther from this side of the city stand the remains of another sacred edifice, on the summit of a lofty hill.

The houses in Tiflis are ill-built, and the streets so narrow that only one carriage can pass through the widest without running the risk of striking against another horseman. We must not however derive our ideas from the description of travellers, before or for a few years after the incorporation of Georgia with the Russian empire in 1801. The letter concerning the customs at Caucasus, Georgia in 1812, written by the wife of a Russian envoy, speaking 'a mass of ruins, melancholy monuments of the ravages of Aga Mahomet and the Persians.' Sir Robert Ker Porter, in 1817, says that the governor was making great improvements, and all the public houses and storehouses were entirely pulled down to make way for the erection of new ones. Among these improvements are the alterations in the great bazar, a long narrow winding street with shops on both sides, which he had caused to be entirely roofed in, and also admitting air by circular apertures. Another Professor Eichwald, who visited Tiflis in 1825 and 1826, and gives some particulars as late as 1829, says, 'Since the year 1801 tranquillity and security have returned, and are now firmly established in Georgia.' The improvements published in Government journals were made every year; since that time Tiflis has been improving in its appearance, is continually enlarged by new buildings, and its inhabitants have easily become familiar with all the comforts and even the luxuries of European life.' Professor Parrot, who was there in 1828, speaks in similar terms of the improvements introduced by the Russian government, but does not appear to be so satisfied with the introduction of European fashions.

One of the worst effects of the habitual intercourse with Europeans is the Asiatic restraint that has been made in the manners of the women, who have thrown off their former Asiatic restraint, without adopting the reserve and decorum of European manners. This effect is much more marked among the officers, because they are generally quartered in the houses of the inhabitants, so that the customary line of separation between the women and the men could no longer be preserved. This circumstance greatly disgusts the Georgians, and they accordingly failed with delight the judicious ukase of 1829, by which the proprietors of newly-built houses are exempted from receiving soldiers into their houses for six years.

Tiflis has been chiefly indebted for its celebrity to its warm baths, and its Georgian name, Tiflis, is said to be derived from the Georgian word tilis, warm, which may have been given it either on account of the warm springs, or from the contrast of the great warmth of the climate of Tiflis, with the preceding residence of the Georgian kings at Mchet, which lies on the declivity of the Caucasus, and has a much cooler temperature. The building of Tiflis and the transferring of the royal residence to this place were effected about the year 1455, by king Waktang Gork-Aslan, and by imitation.

(Ker Porter, Reise, i. 715; ii. 164.)

The mineral springs rise in considerable numbers at the south end of the city, between the stratas of limestone, whence they are conducted into the cavern excavated in the solid rock, roofed, divided into compartments for the men and women, into which not a ray of day-light is admitted, and which are merely rescued from total darkness by the faint glimmerings of a few
twinkling lamps struggling with the vapour arising from
the water. The stench of the place and the disorder at
the market overcame my illumination, show,
says Sir R. K. Porter, sufficient argument for the whole
having been left in shade. He observes however that this
want of order and cleanliness is not to be wondered at,
since the entrance to the baths was on all sides and the
crowd indiscriminately into every chamber. Sir Robert
went to look at these baths, and was much surprised at
being urged by a gentleman who accompanied him, to
view the baths of the women, to which they were shown by
the porter in common. The entrance also seem to cause
any alarm or astonishment. These waters are reputed to
be very beneficial in rheumatic complaints and cutaneous
disorders. No chemical analysis that can be depended on
has yet been made. Professor Parrot also examined the
springs of different baths, states the hottest at 37°
and the coolest at 19° Réamur. There are only two
springs below 30°, the temperature of the air in the shade,
out of the baths, was from 15° to 16° Réamur.

The situation of Tiflis would certainly make it one of
the most delightful spots in the world, if the mountains
between which it lies were not totally destitute of trees.
They now only reflect the rays of the sun from the southern
slope of the Caucasus (which also keeps off the cooling
breeze that often exists on the plains), and the heat in the valley
is oppressive, a heat which often strikes like the glow of a
furnace, and may perhaps be the cause of the bilious dis-
seases prevalent here. The greatest heat during the resi-
dence was on the 23rd of July, between 3 and 5, in the afternoon,
30° Réamur.

Though Professor Parrot states that 'notwithstanding
the great advantages held out by the Russian government,
which entices many persons from Russia and other coun-
tries yet about, from the counsel of state and general down
to the clerk and common Cossack, often long in a few
weeks to return to their native country as to a lost paradise,'
yet the population is constantly and rapidly increas-
ing. In 1830 it was stated not to exceeds 15,000, and is
probably nearly 45,000, it having been 40,000 three
years ago. Full one-half are Armenians, the remainder
chiefly Georgians, that is, old Greek Christians, some
Roman Catholics, and about a hundred Mohammedans.
It is the residence of a Georgian patriarch, a Georgian
metropolitan, and an Armenian archbishop. There
are some manufactories of woolen, cotton, and silk.

Tiflis is most favourably situated to be the medium of
an extensive trade between Europe and Asia, but it is only
since the capture of the Russia by the Persians that
interest has been found in it. It is probable that there has been
direct commerce with Georgia. At first, and till the emperor Alexander granted
free trade to the trans-Caucasian province, the Armenians
wanted no trade with Europeans, and wanted it only to
use at the fair of Nishini Novgorod, to which they brought
Persian goods, raw silk, Cashmere shawls, and pearls, which
they exchanged for woolens, linen, printed calicoes, &c. ;
they often bought with ready money. In 1821 the akase
granting freedom of trade was published, and commerce
greatly increased. In 1823 a rich Armenian went to
Odessa, where he purchased goods to the amount of many
thousand pounds, which he disposed of to great advantage
at Tiflis.

In the following year for the first time, six Armenian
merchants came to Leipzig fair, where they purchased
European manufactures to the amount of 600,000 rubles
bank (25,000£), which they conveyed through Galicia and
the Danube to Odessa, whence it was carried to Redout Kale.
In the year 1825 the value of the goods
purchased at Leipzig was 1,200,000 rubles, and in the
following year twice as much. Professor Eichwald says
it is much to be wished that some European merchants
might settle in Tiflis, and endeavour to improve the trade
from that city to Persia, Afghanistan, Bokhara, and Tibet.
Then the caravans from Cashmere, Cabul, and Tibet
would no longer go to Tauris and Isphahan, but cross the
Ganges, and buy up the Kur to Tiflis, whence the goods
would be forwarded over the Black Sea and Europe.

The trade with Persia is very important, and is almost
entirely in the hands of the Armenians of Bushire on the
Persian Gulf and of Tiflis. The former trade chiefly to the
Pars on their poultry and rice, which makes
between Bushire and Bmbay belong to the Imam of Mus-
cat: only a few English ships come to Bushire. The
value of goods brought from India to Persia was
millions of ducats in 1826, and the exports from Persia to
India 500,000 ducats. A considerable part of this trade
takes the way of Bushire, from which place the
manufactures of England and India go up the Euphrates,
and are disposed of in Turkey. The transit trade of foreigu
goods, both in Persia and Tiflis, especially the trade to
branch of the trade between Tiflis and Persia. On the
whole the commerce of Tiflis is increasing every year
in extent and value.

Sir R. K. Porter, Travels in Georgia, etc.; Let
tres sur la Caucasian et la Geographie, 1812; Klaproth,
Den in den Caucasus und Geographie; Parrot, Reise zum Arab.
land, 1834; Eichwald, Reise in den Kaukasus, Stuttgart,
1837.

TIGA, Professor Kaupa's name for a genus of birds
(Crhyponotus, Sw.; Picus, Horns.), placed by Mr. G. R.
Gray in the subfamily Celebhe (the 5th) of the Pede.

WOODPECKERS.

TIGERS, TIGRONS, [Tigrina], TIGER-CATS, [Tigres].

TIGERS. Although there is but one species of Tiger,
properly so called, the Tiger-Cats, or those species of the
genus Felis in which the tigerine character predominates,
almost always by breed with domestic cats.
The Royal Tiger, Felis Tigris, claimed as an first notice;
and, although poets and poetical zoologists have joined
to elevate the lion with his majestic mane to the sovereignty,
it may be doubted whether the Tiger is not the type of the
feral lioness, the blood-thirsty Staghe of the ancients.

Some have thought that this species was but little
known to the ancients; but, we think, with no sufficient
reason.

The numerous passages in which the word Tigris
occurs in Greek and Latin authors, leave little room for
doubt that the Asiatic Tiger, is a species of Felis,
that was so frequently associated by the latter, is a locality
suitable to what we now know of its geographical distribu-
tion.

When Aristotle (Hist. Anim., viii. 28), treating of hy-
brid animals which spring from an intermixture of dif-
ferent races, says that people pretend that the dogs of India
are bred from the tiger (tigro riges) and a bitch, not indeed
at the first union, but at the third, we see no reason,
considering the locality, which he assigned to the Arvut,
and the opportunities which the conquests of Alexandre
gave him of knowing the animals of India, why the
word should be rendered otherwise than by Tigris in
our present acception of the term. 'The tiger,' writes
him, 'hears the tumult of the harpies or the sounds of
India; following us with an allusion to the tremen-
dous swiftness of the animal, and the strong attach-
ment which the Tigress, notwithstanding accidental ex-
posure, will make, to manifest for her cub.' Agam. Adv.
vi. 20), he notices the Indians of the wild tiger.

Of course he does not omit the story of
the origin of the Indian dogs from the Tiger, and the rejection
of the two first litters as too ferocious, while the third
is taken and reared (Ibid. vii. 40.). But, further,
that is quite clear from the same authority,
that Alexandre had been exhibited at Rome, and that Pliny and others
well knew the distinction between that species and leopards
and panthers. After mentioning the two last, and referring
an ancient decree of the Athenians that they
should not be imported, but stating that the tigro
Cneius Anflius caused a plebislicet to be passed which
permitted the importation for the Circensian games,
he says (Ibid. vii. 41.), that after Tigris brought, first by Scaredus, and then by
Pompey the Great and Augustus, the first who showed a tame tiger
(tigrius) in a day at Rome, upon the dedication of the Theatre of Marcellus
during the consulship of Q. Tubero and Fabius Maximus:
and that the emperor Claudius reigned it with the emperor
Cyreneus pro conoimo, and that Nero remark
the habit of Augustus, besides the exhibitions at
the great spectacles, to show to the public any rarity
that was brought over, 'ut rhinoerotem apud urbei.

Tigrius in consulo, pro conoimo in consulo, pro conoimo, pro
comito; and Dion remarks that the tigrius
was first seen by the Romans, and, as he thinks, by
the Greeks also, were those sent by the Indians as gifts
where they were used for peace from Augustus. The emperor
Philip and one other occasion exhibited ten tigers, together
with thirty-two elephants, ten elks, sixty boars,
leopards, ten hyænas, one hippopotamus, one rhinoceros, forty wild horses, twenty wild asses, and numbers of deer, goats, antelopes, and other beasts; the brutal exhibition being crowned by the mortal combat of two thousand gladiators.

Gordian III. also exhibited ten tigers, and they were present in the shows of Antoninus and Elagabalus. Aurus, in his triumph over Zenobia, showed four, together with a giraffe, an elk, and other rare animals.

Oppian cannot be mistaken when he writes (Cyneg. iii. 130),

Παθόδωξς τα ὑαναι, καὶ γύρως ἀκάλυπτα;

for here we have leopards and tigers in the same line, and the epithet ακάλυπτας (having a variegated back) is quite applicable to the latter.

The Latin poets abound with allusions to the Tigris, that, in most instances, can hardly be allotted to any animal but the Royal Tiger; for, though Virgil, in his fourth 'Georgic' (i. 30, Nat. Hist. xiii. 155), speaking of the rain or in the passage where Cyrene is warning Aristeas as to the forms into which Proteus will transform himself, the word, evidently, does not there allude to colour, but to ferocity. In the fourth 'Aeneid,' Didò, in his exclamation against Æneas, says,

— Paris grœsus utebatur horrens
Causans, Hyæhænsque adormo in uestis tigres.

The tigers of Baccus may be considered more doubtful. In the 'Gemmae Sculp. Artium' there is a representation of a Felix with the cornelian (cornogla), with the superscription, 'Tigre di Bacho;' but though the figure, generally, might pass for a Tiger, the tail of the animal is terminated by a shaggy tuff, and no tiger's tail is. Claudian comes much nearer to the mark where he describes Iacchus as marching crowned with ivy, and clad (in the skin) of the Parthan Tiger. When Virgil describes Orpheus, as 'muculentem tigres' as 'soothing tigers' (Georg. iv., 510), and Horace, with nearly the same thought, addresses Mercury,

'Tu potes tigres similius stygia
Duestro' (Carm. iii., Ode ii.); and again, in his epitale to the Pisos ('De Arte Poetica,' l. 383), says of Orpheus,

'Dicta as hoc lenius tigres, neboaque
Salviora tigris.'

they make the Tiger personify the greatest ferocity, and they certainly could not have chosen a more apt representative.

Marital speaks of the Tiger in the time of Titus and Domitian. (Spect. Epig. 18, and lib. i., Epig. 105.)

To every literary allusion, there shall advert to one more literary proof, and one piece of pictorial evidence: and we think that no doubt can exist that, although the Royal Tiger was not so abundant in the Roman shows, particularly the earlier ones, as the leopard, the Syrian or Persian, and containing, as distinguished from the other great cats, were as well and familiarly known to that people.

Pliny, in his chapter 'De Atlantia Arboribus et Cedrinius Malefus' (Nat. Hist. xiii. 155), speaking of the rain or pattern of these tables, says that where it was oblong or lengthened, they were called tigrine, but where it was wreathed or curled (unerto), they were termed pantherine.

The pictorial evidence (so to speak) was furnished by the mosaic found at Rome near the arch of Gallienus. This work of art, executed not improbably in commemoration of the exhibition of Claudius above noticed, four Royal Tigers, each devouring his prey, are well represented.

Our Zoological Societies and menageries have so increased in number during a long period of peace, that it becomes almost superfluous to describe a form so well known. But as a description of an animal holding so important a rank in the animal kingdom may be expected, we select that of Mr. Bennett, who, in the 'Tozer Menagerie,' remarks that the Tiger, closely allied to the Lion in size, in power, in external form, in internal structure, in zoological characters, in provoking habits, and in sanguinary propensities, is at once distinguishing from it, and from every other of their common genus, by peculiar markings of its coat. 'On a ground which exhibits in different individuals various shades of yellow,' says Mr. Bennett, 'he is elegantly striped by a series of transverse black bands or bars, which occupy the sides of his head, neck, and body, and are continued upon his tail in the form of rings, the last of the series uniformly occupying the extremity of that organ, and giving it a black tip of greater or less extent, according as the under sides of the inner sides of his legs are almost entirely white; he has no mane; and his whole frame, though less elevated than that of the Lion, is of a slenderer and more graceful make. His head is also shorter and more rounded.

There is a picture of a Tiger, almost as old as the Cenotaph, and with the stripes visible only in particular lights: this has been exhibited in this country. According to Du Halde, the Chinese Tiger ('Lou-chu, or Loo-hu') varies in colour, some having stripes of white and grey.

The size of the Tiger varies also; but the dimensions of the form, when fully developed, are, if we are to give credit to some accounts, the versricity of which has not been impugned, most formidable. Buffon notices an individual which (tail included, and without record that Hyder Ali presented to the Nabob of Arcot one which measured 18 feet in length. The average height varies from about four feet to about three feet, and the length from about eight to nine feet to six.

Geographical Distribution. Asia only, and not the south of Africa, as Buffon erroneously states; but authors generally agree that the Tiger is now rarely, if ever, met with on this side of the Indus. It is said to be found in the deserts which border on the ocean in the East, as the banks of the Oby; and in the south of China, and the larger East Indian Islands (Sumatra, for instance), it is common. Pennant states that it is found as far north as China and Chinese Tartary, and about Lake Aral and the Caucasian Mountains, while the inhabitants of the same author in continuation, 'and Hyrcania, of old famous for its wild beasts; but the greatest numbers, the largest, and the most cruel, are met with in India and its islands. In Sumatra the natives are so infatuated that they seldom kill them, having a notion that they are animated by the souls of their ancestors. They are the scourge of the country; they lurk among the bushes on the sides of rivers, and almost depopulate many places. They are insidious, blood-thirsty, and many turn their backs to the preyer on the human race.' Hindustan may be considered the head-quarters of this destructive animal; there it is that he reigns unawed even by the lion, which with the disputes the mastery, and which is comparatively rare in that peninsula.

Habitat, Chase, &C.—The bound with which the ambushed Tiger throws himself upon his prey is as wonderful in its extent as it is terrible in its effects. Pennant justly observes that the Tiger, which is preys in this deadly leap is scarcely credible. Man is a mere puppet in his grip; and the Indian buffalo is not only borne down by the ferocious beast, but carried off by his enormous strength. If he fails, it has been said that he makes off. This may be; but in the instat of the leap it does not sink away, but pursues the affrighted prey with a speedy activity which is seldom exerted in vain. This leads us to the observation of Pliny celebrating its swiftness, for which the Roman zoologist has been censured, most unjustly, apparently; nor is he the only author among the ancients who notices its speed. Oppian (Cyneg. i. 323) speaks of the swift Tigers as being the offspring ('προσόμονας') of the xerop. Pliny, says Pennant, has been frequently taken to task by the moderns for calling the 'Tiger animal tremendous velocitatis;' they allow it great agility in its bounds, but deny it swiftness in pursuit. Two travellers of authority, both eye-witnesses, confirm the fact that Pliny says: the one indeed only, that the Tiger is 'a vast fleetness,' the other saw a trial between one and a swift horse, whose rider escaped merely by getting in time amidst a circle of armed men. The chase of this animal was a favourite diversion with the great Cam-Hi, the Chinese monarch, whose courtiers, writes Mr. Bell, that faithful travelled, and the Père Gerbillon, saw these proofs of the Tiger's speed. +

In the 'Etstudii, seu Centuriam Imaginum Hieroglyphicorum' (ciz. Loc. xxiii.) is a wood-cut (here copied) that may refer to some Asian Tiger.

Ferocious as the Tiger is, and much as it may deserve the odium heaped upon it, the general chorus of the herd of authors who eulogize 'the courage, greatness, clemency, and generosity' of the lion, excepting it, with the unpro
TIGER.

voked ferocity, unnecessary cruelty, and poltroonery of the Tiger, becomes ridiculous, though led by such names as Buffon and Pennant. The lion has owed a good deal to his man and his noble and dignified airs; but appearances are not always to be trusted. Mr. Barrow, with much more truth, characterizes the king of beasts as powerful but treacherous, 'Happy,' says that traveller, 'for the panther, the Hottentots, and those animals that are the objects of its destruction, were its noble and generous nature, that so oft has fired the imagination of poets, realized, and that his royal paw disdained to stain itself in the blood of any sleeping creature! The lion, in fact, is one of the most indolent of all the beasts of prey, and never gives up the struggle of a pursuit unless hard pressed by hunger.'

Pennant gives the following as an instance, after stating that there is a sort of cruelty in the devastations of the tiger, that 'a gentleman in our generous island, seeing the hot, hot polter upon his horse in its sudden retreat on any disappointment: 'I was informed by very good authority, that in the beginning of this century some gentlemen and ladies, being on a party of pleasure under the shade of trees, on the banks of a river in Bengal, observed a tiger preparing for its fatal spring; one of the ladies, with amazing presence of mind, laid hold of an umbrella and fueled it full in the animal's face, which instantly retired, and gave the company an opportunity of removing from so terrible a neighbour.'

Tiger springing from a considerable distance, 15 or 20 feet, and from ambush; and we suspect that a cross-examination of the parties concerned might have slightly damaged the anecdote. Granting, however, that this bold lady walked up to a crouched tiger, and suddenly opened an umbrella in its face (for that, we presume, is the action meant), we may easily conceive that the surprise may have utterly confounded him; but this is not poltroonery. Indeed the same author immediately afterwards gives a tolerable proof of the animal's daring: 'Another party had not the same good fortune; a tiger darted among them whilst they were at dinner, seized on one gentleman, carried him off, and he never was more heard of.'

But there is another story, a very sad one, which is pregnant with proof of the tiger's hardihood; we allude to the distressing death of Sir Hector Monro's son. Mr. Wood ('Zoography') relates the horrible occurrence in a few words:—

'This unfortunate gentleman,' says Mr. Wood, 'accompanied by three of his friends, went on shore, December 22, 1792, on Sawgar Island to shoot deer. They continued their sport till the afternoon, when they retired to the edge of a jungle to refresh themselves; where they had not remained long before one of the party, who was leaving the rest to shoot a deer, heard a dreadful roar, and saw a large tiger spring on poor Monro, and rush with him into the jungle with the greatest ease, dragging him through everything that obstructed his course, as if all were made to yield and accommodate him. All that his companions could do to rescue their friend from this shocking situation was to fire at the tiger; and it is evident that their shot took place, since, in a few minutes after, Mr. Monro staggered up to them covered with blood, and fell. Every man of the ship was provisions and arms; and, with him immediately, but in vain; he expired in the course of twenty-four hours in the greatest agonies. His head was torn, his skull fractured, and his neck and shoulders covered with wounds made by the claws of the savage beast. It is worthy of observation, that neither the fire that was blazing close to them, nor the noise and laughter which it seems they were making at the time, could divert this determined animal from his purpose.

But is it any doubt as to the courage of the tiger be entertained? Father Tachard's account of a combat between that beast and two elephants at Siam will be sufficient proof. He relates that a lofty bamboo palisade was erected, occupying an area of about 100 feet square. Into this elephant was introduced, and harried into the air by the tiger by leaps and bounds, and then the fainthearted elephant was displayed by the tiger, and armed with a club. A large tiger was now brought from its den, and held with cords till one of the elephants approached and inflicted two or three blows on its back with its trunk, so heavily laden that it fell stunned, as if dead. Then they loosed the tiger. No sooner did he recover than he sprang with a dreadful roar at the elephant's trunk stretched out in act to strike him; but the weary elephant drew up his trunk, and recurred the tiger on its tuks, hurled him into the air. The tigress in her rage was intent upon the elephant; and he ran several times round the palisade, frequently springing at the spectator. Afterwards three elephants were set upon him, and they in turn were devoured; but they did not himself, and he was killed, if the combat, as it must incorrectly called, had not been stopped. Nothing could be more unfair towards the tiger than the whole of the proceeding; we would to say that no quadruped except a British bull-dog could have shown more pluck to use a vulgar but expressive term, than this abnormally treated beast.

The author generally states that after the tiger has secured its prey it plunges its head into the body of the animal up to its very eyes, as if to whiten its mouth and blood till the corpse is extinguished, before it tears it up to pieces. The best modern accounts tend to prove that the tiger is not more bloodthirsty and has no more bloodsucking propensities than the other large beasts; and that this blood-drinking habit is grossly exaggerated.

The tigress brings forth three or four, or five or six cubs at a time; and she is a very fond mother, 'braving every danger for them, and furiously attacking man and beast at the risk of eating food that it has beenf* to use a vulgar but expressive term, than this abnormally treated beast.

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discharged a poisoned arrow, generally with fatal effect, when the animal came in contact with a cord stretched across its path, and this method is said still to be in use in some places. Again, a heavy beam was suspended over the eyrie, and when the wreck fell, that my sportsmen might pour him on his disengaging a cord which let the beam fall. A Persian device is said to consist of a large spherical strong interwoven bamboo cage, or made of other suitable materials, with intervals throughout, three or four inches broad, through which the elephant ascends by the path of the tiger's haunt, a man provided with two or three strong short spears takes post by night, with a dog or a goat as his companion, wraps himself in his quilt and goes to lie on the ground in the tiger's haunt, a man provided with two or three strong short spears takes post by night, with a dog or a goat as his companion, wraps himself in his quilt and goes to lie on the ground. Thus would the tiger's habitat be crouched, and one of my guns went overboard. The struggles of my elephant to crush his still resisting foe, who had fixed one paw on his eye, were so energetic, that I was obliged to hold on with all my strength, to keep myself in the charge of the elephants. The second of these tigers was again retained in my hand, went off in the scuffle, the ball passing close to the mahout's ear, whose situation, poor fellow, was anything but enviable. As soon as my ele- 
apant was prevailed upon to leave the killing part of the business to the sportsmen, they gave the carcase to the tiger the coup-de-grace. It was a very fine female, with the most beautiful skin I ever saw. In the ' Asiatic Annual Register,' for 1804, a gentleman who had been present at the killing of the same tiger gives an account of a hunting-party of the Nawab Asuf- ud-Dowlah. After describing the immense cavaledge of the Nawab, he says:—'The first tiger we saw and killed was in the mountains; we went to attack him about noon; he was in a narrow valley, which the Nawab surrounded with above two hundred elephants; we heard him growl terrifically in a thick bush in the middle of the valley. Being accustomed to the sport and very eager, I pushed in my horse, charged the elephant, the fierce animal, turned tail, and deprived me of the opportunity to fire. I ventured again, attended by two or three other elephants; the tiger made a spring, and nearly reached the back of one of the elephants on which he was riding; the elephant, however, forectly as to throw these men off his back, and they tumbled into the bush; I gave them up for lost, but was agreeably surprised to see them creep out unhurt. His Excellency was all this time on a rising ground near the thicket, looking on calmly, and beckoning to me to drive the tiger towards him. I made another attempt, and with more success; he darted out towards me on my approach, roaring furiously and leaping his sides with his tail. I luckily got off in time, and retracted into the shelter of the twelve elephants just then pushed into the thicket, alarmed the tiger, and obliged him to run towards the Nawab, who instantly gave him a warm reception, and with the assistance of some of his omans, or lords, laid the tiger sprawling on his side. A loud shout of waka! waka! proclaimed the victory.'

There is in Bishop Heber's 'Journal' a most graphic description of a tiger-hunt, but our limits will not permit us to indulge in more extracts.

Those who have represented the tiger as untameable have no ground for the assertion. It is as capable of being tamed, and of attachment, even to fondness, for its keeper, as any other animal of its kind. We have seen many instances of this, and of the understanding and friendship between the man and the beast, and Mr. Bennett mentions a remarkable example in his 'Tiger Menagerie.' A tigress of great beauty, in the Tower when he wrote, and scarcely a year old, had been, during her passage from Calcutta, allowed to range about the vessel unrestricted, and had become perfectly familiar with the sailors, showing not the slightest symptoms of ferocity. On her arrival in the Thames, the irritation produced by the sight of strangers instantly changed her temper; she would not enter any of the ships, where her keeper was, that kept the lions in the Tower, could hardly be prevailed on by her former keeper, who came to see her, to allow him to enter her den; but as soon as the tigeress recognised her old friend, she fawned on him, licked him, caressed him, and manifested the most extravagant signs of pleasure; and when, at last, he left her, she cried and whined for the remainder of the day. The tame tigers of the mendiant priests, or Pakis, are wild and dangerous.

But whilst there can be no doubt of the tameable qualities of the tiger, and of indeed of all the great cats, they are not to be incautiously trusted. The natural disposition is always ready to break out; and the midst of them, though

* Niy-GWan. [Arbuthn, vol. 1, p. 76.]

Thus Bonitus states that, in 1628, a tiger at Batavia, which had been brought up from a cub, and accustomed
to men all its life, escaped from its cage, fastened on a horse which was feeding near, and killed it; so that the citizens rose upon the tiger with fire-arms and slew it in its turn, to prevent further mischief.

We conclude this part of our sketch with the account given by John Mason, who formerly kept the beasts in Exeter Change, to Mr. Wood, of his fearful encounter with one of these creatures.

About the year 1802 a tiger had been purchased by Mr. Alpey to send to the emperor of Germany, and placed in the Tower, there to remain for a few days, till the ship destined to convey the animal abroad was ready. The beast was confined in a large, strongly ventilated, wooden case, lined with iron hoops, some of which he ripped off during the first night of its confinement, and gnawed the case partly through. This being perceived, the next day the case was repaired by the addition only of a strong piece of the outside. *The consequence,* says Mr. Wood, *might well be expected.* The tiger renewed his efforts, and in the course of the following night made his escape, and sprung upon a wall ten feet high, where he remained till Mason came in the morning. The fear of losing such a valuable animal induced this poor fellow, for a reward of ten guineas, to hazard his life in an attempt to secure the tiger. For this purpose he engaged a sergeant and some other persons to assist him, whom he placed in a room, the door of which opened upon the leads, from whence he could reach the animal. He then provided himself with a strong rope, one end of which he gave through the window to his companions, and with the other, having a running noose upon it, he slowly approached the tiger, and threw it over its neck. *This was the critical moment: the people within were directed to pull the rope and secure the beast: unfortunately the noose slipped off, and the enraged animal immediately sprang upon the keeper, fixing his teeth into the flabby part of his arm, and tearing his breast and hand in a dreadful manner with his claws. In this shocking situation the poor man lay under the tiger; while the sergeant cut a bullet into four parts, and, having loaded his musket, he fired through the window at the animal; who, the moment he received the shot, quitted his hold; and, after staggering for a few minutes, expired. The bullet however which destroyed the tiger had nearly been equally fatal to the man, one of the quarters having glanced against his temple, and deprived him of all sense and motion for a considerable time. Nevertheless, after keeping his bed a fortnight, he gradually recovered, and is now (1807) perfectly well, though he will carry the mark of his enemy about with him as long as he lives.* (Zoography, vol. i.)

Royal Tiger.

In the East the tiger is associated emblematically with power. Thus the Chinese mandarins covered their seats of justice with its skin. In pl. 17 of the atlas to Sir George Staunton's 'Embassy to China,' representing a military post, two swordsmen are habited and shielded so as to advance and protect officers of Hyder Ali and Tipoo Saib were among the choicest of their troops. The tiger's head, gorgeous with jewels, that formed the principal ornament of the throne of Hyder and Tipoo, and was taken by the British among the spoils of the latter at Seringapatam, is well known; as is the automatic representation, clumsy enough it must be admitted, of a royal tigress tearing to pieces a soldier in the pay of the British, and imitating the growling of the beast and the terribleness of the man, taken also upon the same occasion. (See the Museum at the India House.)

The term 'Tiger' is locally and erroneously applied to the Jaguar. [LEOPARDS, vol. xii., p. 436.]

Fossil Tigers, &c.

Professor Buckland notices the remains of the Tiger as the case at Kirkdale, at Plymouth, and in the basins of Antilles. The great fossil Tiger or Lion (Felis spelus, Goldiuss), and other extinct cats, lived before man was an existence. The following fossil cats are enumerated by Von Meyer, besides the great species above-mentioned. Felis antiquus, Cuv.; F. lemuriens, Cuv. and Bob.; F. brevirostris, Cuv. and Job.; F. pardimenta, Cuv. and Job.; F. aroenensis, Cuv. and Job.; F. megasaura, Brav.; F. cultridens, Brav.; F. pachyntes. Kaup.; F. Oggyria, Kaup.; and F. proles, Kaup. [Fossils, vol. i., p. 274.]

Dr. Lund, in his 'View of the Fauna of Brazil previous to the last Geological Revolution,' remarks that the Hunting Leopard (Felis jubata, Linn.; Cynalurus, Wagl.), which differs from the rest of the Cats in many essential characters, has been very properly formed into a separate genus; for its claws are not retractile, it is gregarious, and of so mild a disposition that it is frequently tamed and employed in the chase. But, he observes, as a remarkable instance of what has been termed the Castrum Leo, that its dental arrangement is absolutely the same as that of the true Felis, not having the flat projection on the large tearing molar of the upper jaw, which is found in all the other predaceous genera, and the development of which is in inverse proportion to the animal's carnivorous propensities. Dr. Lund recognised the form of dentition in a small animal of the extinct Fauna of the Brazilian region, which was the scene of invaluable labours, not exceeding a domestic cat in size; and he has named it Cynalurus minutus. Besides this he discovered the remains of two species of the normal feline form, one as large as the long-tailed tiger-cat (Felis macgracilis, P. Max.), the other larger than the Jaguar (Felis Bap. Linn.), and comparable to the Tiger and the Lion, the largest species of the Old World.

Tiger-Cats.

Under this title may be classed all those lesser stipet and spotted Asiatic, African, and American Cats which do not come under the well-understood denominations of Tigers, Leopards, and Panthers.

Before I descend to a description or illustration of this beautiful group, it will be advantageous to the student to be put in possession of M. Temminck's well-considered and digested monograph of the genus Felis divided into two sections according to their geographical distribution.

Section 1.

This comprises the Felidae of the Old Continent and archipelago.

Species.

1. Felis Leo, including the three varieties of Barbary, Senegal, and Perrea. [LION.]
2. Felis Tigris, the Royal Tiger (here treated of). [LEOPARDS, vol. xii., p. 433.]
3. Felis jubata, the Hunting Leopard. [LEOPARDS, vol. xii., p. 433.]
4. Felis Pardus, the Panther. [LEOPARDS, vol. xii., p. 433.]
5. Felis Macgracilis, the Royal and Florida Lynx. [LEOPARDS, vol. xii., p. 433.]
6. Felis macgracilis, the Bima-Dahan. [LEOPARDS, vol. xii., p. 433.]

Royal Tiger.
7. Felis Serval, comprising F. Serval and F. Capensis, Linn., the Chai-pard of Desmarest, and the Caracal of Bruce.

8. Felis ceylonensis. For the characters of this and the seven species of Lynx which follow it in Mr. Temminck's monograph, see Lynx, vol. iii. p. 217.

16. Felis Catus. [Felide, vol. x., p. 221.]

17. Felis manicaula. [Felide, p. 222.]

18. Felis minuta, identical with the Felis javanensis of Horfe1d's 'Zoological Researches in Java,' and therefore not to be adopted.

Section 2.

This comprises the Felidae of the New Western World.

19. Felis concolor, the Puma. [Lion.]

20. Felis onp, the Jaguar. [Leopards, vol. xiii., p. 434.]

21. Felis jaguarondi. Bought by Mr. Temminck at the sale of Mr. Bullock's collection, for the museum of the Netherlands.

23. Felis rufa, Guldenat. Bay-Cat of Pensant: with this M. Temminck describes also a specimen brought from Mexico, which may prove distinct. Bought by M. Temminck at Mr. Bullock's sale for the museum of the Netherlands.

24. Felis pardalis, the Ocelot.

25. Felis macroura.—N.B. These two last confined together by Linnaeus under the name of F. pardalis. The Mexican Tiger of Peters is said to appear to be a representation of F. macroura.

26. Felis mitsi, the Chatzi, F. Cuv.

27. Felis tigrina.

From the account, as far as it goes, has been of great benefit; but the student should examine the menageries and museums, as well as the works of other authors, and he will find several cats noticed both before and since the publication of M. Temminck's catalogue. Among other authorities the publications of d'Azara, of Sir Stamford Raffles, of M. F. Cuvier, of M. Desmarest, of Mr. J. E. Gray, of Dr. Horfheld, and of Mr. Vigors in the Zoological Journal, of Dr. Horfheld in the Zoological Researches in Java, of Prince Maximi1an, of M. Lesson, of Sir William Jardine (Naturalist's Library, Mammalia, vol. ii., Felinae), and of Mr. Darwin (Zoology of the Beagle), may be consulted with advantage.

Dr. Horfheld and Mr. Vigors (Zool. Jour., Vol. iv., p. 390) remark that they are not of M. Temminck's opinion, that the determination of species in such groups as these rests upon any examination, however acute, of preserved specimens in cabinets, or in any research, however extensive, into the stores of furriers. Such examination, they think, may be satisfactory to conjecture; professionally plausible conjecture, it may be true, but still conjecture, and not facts. They add that we are in this way as likely to fall into the error of confusing true species as into that of creating nominal ones, and they express their opinion that the truth may be satisfactorily obtained only by diligent researches in the native country of these animals, or by accurate observations on their changes and differences as to sex, age, and season, when in a living state and in confinement.

M. Temminck, in his Tableau Methodique (1827), states that then there were known thirty distinct species of cats and seven or eight other doubtful indications.

Asiatic Tiger-Cats.

Example, Felis nepalensis, Horf. and Vig. Description.—Size of Felis Javanensis, Horf., but its habit more slender, the tail and neck proportionally elongated. Ground-color, grey, with a very slight admixture of tawny; bands and spots of the head, back, neck, throat, abdomen, and thighs, deep black; superior longitudinal bands resembling those of F. Javanensis. Ground-color of throat and abdomen nearly white; the lower flanks marked with transverse indistinct tawny bands, the upper parts being marked only by diligent researches in the native country of these animals, or by accurate observations on their changes and differences as to sex, age, and season, when in a living state and in confinement.

M. Temminck, in his Tableau Methodique (1827), states that then there were known thirty distinct species of cats and seven or eight other doubtful indications.

African Tiger-Cats.

Example, Felis Serval, the Serval. Description.—Upper parts clear yellowish, with black spots; lower parts white, with black spots also, but they are less numerous. Upon the head and neck the markings are most conspicuous, and form symmetrical lines on each side directed towards the shoulders. On the other parts the back of the head is more or less indistinctly marked; the neck there is marked, and show a disposition to form four rows; on the body and thighs they are larger and round, and they are smaller but equally round on the extremities. Upon the face and muzzle they are minute.

Felis nepalensis

Felis Serval

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Back of the ears black at the base, succeeded by a transverse white bar; tips of the ground-colour of the body. On the inside of the fore limbs two conspicuous black transverse bars; the hind limbs with similar markings, equal to that which he has given as its average measurement. The tail however of the Tower specimen did not exceed six or seven inches; its extremity was overgrown with hair, and there was no caudix. Still its equality throughout and its abrupt stumpiness induced the belief that this abbreviation was purely accidental; and he felt by no means inclined to regard that specimen as a new species, to be distinguished by the excessive shortness of that appendage, by the unusually pale colour of its markings, and by some slight peculiarity in the mode of their arrangement, which, he observes, varies in every individual that he had seen.

Locality.—Mexico, Paraguay, and probably Peru.

Habits, &c.—The Ocelot remains in the deep forests during the day, sallying forth at night in quest of small quadrupeds and birds, the latter of which it successfully chases in the trees, for it is a very expert climber. It is, as is generally supposed, the Thoacoedel, Thylacidae. *Catus Pardus Mexicanus* of Hernandez, it is said to stiwe itself out as if dead on the limb of some tree when it spares monkeys in the neighbourhood. They, urged by curiosity, proceed to examine the supposed defunct, and fail victimes to their curiosity.

The Ocelot has been so completely tamed as to be left at liberty, and it is said to be capable of strong attachment to its master. Mr. Bennett states that the specimen at the Tower, a male, was perfectly good-tempered, exceedingly fond of play; and had much of the character and manners of the domestic cat. Its food consisted principally of rabbits and birds; the latter it plucked with great dexterity, and always commenced its meal with the head, of which it seemed particularly fond; but it did not eat with the ravenous avidity which characterizes nearly all the animals of this tribe.

The Ocelot.


Description.—About a third larger than the domestic cat; length, exclusive of tail, rather more than two feet; tail eleven inches, height to middle of back, about one foot two inches. Ground-colour of fur on the upper parts pale yellowish; on the lower, pure white; at the neck dull grey, and very thick and close. Body covered with regular dark patches; those upon the back entirely black and disposed longitudinally in four rows; those upon the sides surrounded with black, with the centres of a clear fawn, arranged in nearly five rows. Spots upon the lower part of the body, where the ground-colour of the fur is white, full, and arranged in two lines composed of six or seven patches on each side. Limbs covered with many round spots of smaller dimensions; on the fore-legs near the body, two transverse bands. On the throat a sort of half collar, and on the under-jaw two crescent-shaped spots. Behind each eye two bands about two inches long terminating opposite the ear. Forehead bordered by two lines, between which are numerous spots, and, at their origin, a blackish mark from which the whiskers spring. Outside of the ear, black, with a white spot upon the small lobe. Base of the tail spotted with small blotches, which towards the end run into half-rings, which are broadest on the upper surface. Pupil round. *P. Cuv.*

This animal (a female) was extremely gentle; and of those with whom it was familiar passed its cage or did not approach it, it would express its discontent by a short cry. It manifested great delight when it was caressed. A breed
Felis milvus.

in the Paris menagerie, and was procured from a dealer in Brest. **Locality.—South America.**

Desmarest and others identify this animal with the Chibiguazu of D'Azara. Temminck, who received a skin from Rio de Janeiro, considers it distinct.

D'Azara's description comes very near to that above given as far as colouring is concerned; but he gives the average length as three feet six inches; the individual which he described, the largest male he had seen, was four feet all but an inch in length; tail thirteen inches; height at shoulders one foot and a half, and behind one foot seven inches and a half. It was so fat that immediately after death it weighed five-and-thirty pounds; the females, he says, are rather less.

The same acute observer, speaking of his Chibiguazu, remarks that some of the Guaranian call the domestic cat *Chibi,* and others *Moracagu.* In the same manner, he says, some give the wild animal of which he is treating the name of Chibiguazu, and others that of Moracaguiguazu; both appellations signifying Great Cat. Many Spaniards, he adds, call it Onza (Ounce).

He states that the species is so common, that his friend Noseda captured eighteen individuals in two years, within two leagues of his pueblo; but he adds that, notwithstanding this abundance, few are acquainted with it, the huntsman and dogs never falling in with it, and being unable to penetrate to its haunts: he very much doubts whether any quadruped hides itself more effectually. He describes it, rearing up its tail in the most imperceptible places, and as coming forth after dusk, especially on dark stormy nights, when the chibiguazu daintily enter the corrals and court-yards, though no instance is known of their detection by the dogs. When the moon shines they are seldom seen from visiting inhabited spots, and never are trapped to lie in wait for them with a gun is hopeless, so sharp a look-out do they keep. They carry off domestic fowls from trees which they climb, sometimes six in one night, and often leave several dead. Men and dogs are avoided by them with extreme caution, and each pair is supposed to live in a separate district, for a male and female, and no more, are always caught in the same place. Noseda formed a trap of strong stakes, with three divisions: in the middle division he placed a white fowl, so that it might not only be heard but seen at a distance: the other divisions were so framed as to shut by the falling of the planks as soon as the chibiguazu entered. This trap was set in the places to which they resorted for prey, and those caught were turned into a great den in Noseda's court-yard. Some of these got away, and were taken again two or three times in the same trap; they were recognised by ear-marks and other proofs: D'Azara infers from this that the idea of danger was obliterated from their recollection by their desire to possess the fowl. He remarked that all which were kept in the den deposited their excrements in their drinking-place, and when he substituted a narrow-necked jug to prevent this, they mounted to its edge for that purpose, and never missed the vessel or its immediate neighbour.

Nearly the whole day was spent by them rolled up in a ball, and, when a chibiguazu wished to stretch himself, he first licked the one at his side. When straw was put in their den, or so that they could reach it by thrusting their paws through the bars, it was always found that on the day following they had placed it in a

heap, after having divided it into bits some quarter of an inch long, and on this they reposed. The small sticks and twigs with which the inside of their den was furnished were broken and torn to pieces in like manner. Twilight and night were passed in pacing to and fro close to the sides of their den; and if crossed or interrupted by another, they hurled fur and blood at it; sometimes without using their paws. They never quarrelled, unless they were very much irritated, and then they struck at each other with their fore-paws. They devoured five pounds of flesh per day when first caught, but afterwards became more sufficed. Nourishment was soon procured from two or fourteen individuals confined, and they took it with their paws according to the length of time they had been there, without any interference on the part of the owner.

With natural circumstances, they did not take his portion, or disregarded it, another immediately snatched at it without any defence on the part of the right owner except by sneering, and sometimes by blows with their fore-paws. A walk was made for them, enclosed by a sort of hurdle, so that rats, fowls, ducks, or young dogs could be introduced into it: upon opening the cage it was observed that usually one only went out for each victim, and almost always according to the order of their confinement. Hares and dogs they seated with their mouth by the nape of the neck, over-riding their legs, and then they would they could not stir, till they were dead. Cats' flesh appeared to produce the mange, fretting the chibiguazu, making them mew like cats, and at last destroying them.

Birds, vipers, and serpents were also raised in this diet occasioned violent and continual vomiting; they wasted to skeletons, and died in a few days. If the dog introduced equalled them in size, they touched him not, it appears that they do not assist each other. If a chibiguazu cannot manage any prey alone, they leave it. Birds were caught by the head and neck, and thoroughly stripped of their feathers before they were eaten. No unnecessary cruelty was manifested. Noseda observed that one did not kill a fowl put into his den till the third day. D'Azara and his friend frequently closed the doors of the yard, and opened the den that the chibiguazu might leave it; those most lately caught went first; and sometimes the old ones would not go out even when their den was entered that it might be swept. They were left at liberty for several hours, during which they examined every crevice, and then lay down to sleep. When boys persecuted them with sticks, they retreated to their den without turning on their persecutors, even when severely beaten. A male once so much occasioned being bad-tempered, on entering his den he was abused and bitten by his female, as if to punish him. Some individuals were incarcerated for more than a year without exhibiting any sign of love. The sight of the male like the female, and they resembled that animal in their form and habits, in lying down, licking and cleaning themselves, washing their faces with their paws, puffing, sneezing,—in fact in every way. D'Azara concludes by stating that his friend caught a young one, and it became so thoroughly tame that it slept in the skirts of his clerical gown, and went about loose. He affirmed that no animal could be more tractable: but it devoured the poultry of his neighbours, and they killed it.

Felis Pajeros.—The Pampas Cat, Pajero, or Jungle Cat.

**Description.—Fur of great length:** longer hairs of the back upwards of 3 inches, and those of the hinder part of the neck, and back from 4 to 5 inches. They are of general pale yellow-grey. Numerous irregular yellow or sometimes brown stripes running obliquely from the back along the sides of the body. On each side of the face two stripes of yellowish or cinnamon colour, much broader, extending backwards and downwards over the cheeks, on the hinder part of which they join, and form a single line, which encircles the lower part of the throat. Tip of the muzzle and chin white; a spot in front of the eye, and beneath the eye, are broad. The head is broader and hinder part of fore-legs, white also. An irregular black line running across the lower part of the chest, and extending over the base of the fore-legs externally: above this line are two other markings, a broad black line fixed on the chest. On the fore-legs three broad black bands, two of which encircle the leg: on the posterior legs about five black bands externally, and some irregular dark.
spots internally. Feet yellowish, and under side of tarsus of a slightly deeper hue. On the belly numerous large irregular black spots. Ears moderate, with long white hairs internally; externally of the same colour as the head, except at the apex, where the hairs are black, and form a slight tuft. Tail short, somewhat bushy, and devoid of dark rings or spots—the hairs are in fact coloured as those on the back. On the upper part of the body each hair brown at the base, then yellow, and at the apex black. On the hinder part of the back the hairs almost black at the base, pale yellow at the apex, and pale brown at the apex white: towards the apex they are white, and at the apex black. The greater number of the hairs of the moustaches white. Length from nose to root of tail, 26 inches; of tail (fur included), 11 inches. Height of body at shoulders, 13 inches. Size about equal to that of the common wild-cat of Europe; but the Pampas cat is stouter, its head smaller, and its tail shorter. (Waterhouse.)

Mr. Waterhouse (Zoology of the Beagle) observes that the markings of this animal vary slightly in intensity: those on the body, he remarks, are generally indistinct; but the black rings on the legs are always very conspicuous.

Locality.—D'Azara says that he knows not, nor has he heard, that this species exists in Paraguay, although it formerly may have been seen there; but as the country became tolerably well peopled, and there were fewer plains, the inhabitants probably extirpated it. He caught four in the Pampas of Buenos Ayres, between 35° and 36° S. lat., and three others on the river Negro. He says they are found on both sides of the La Plata.

Darwin (loc. cit.) gives as its habitat Santa Cruz, Patagonia (April), and Bahia Blanca (August). He states that it is common over the whole of the great plains which compose the eastern side of the southern part of America; and he says he has reason to believe, from the accounts he received, that it is found near the Strait of Magellan, which would give it a range of nearly 1400 miles in a north and south direction, D'Azara having stated that it extends northward as far as 30° S. lat. One of Mr. Darwin's specimens was obtained in 56° S. lat., at Santa Cruz.

Habits. Food, &c.—D'Azara says that the natives call this animal gato pajero, because it lives on the plains, concealing itself in jungles, without entering into the woods and thickets. Aperes, or guinea-pigs, according to him, form its principal food. Mr. Darwin states that it takes its name from paja, the Spanish word for straw, from its habit of frequenting reeds. The specimen taken by him at Santa Cruz was met with in a valley where thickets were growing. When disturbed it did not run away, but drew itself up and hissed.

The earlier history of Tigranes is late known; Strabo (p. 532, C. 11.) and Justin (xxviii. 3) state that he was sent in his youth as a hostage to the king of the Parthians, who afterwards restored him to liberty. He conquered Gordyene and Mesopotamia, and the Syrians chose him for their king in A.D. 82, according to Arrian (De Rebus Scep., 70), in B.C. 80. Before B.C. 74 he concludes an alliance with Mithridates, who was then about to begin his third war with the Romans. The conditions of this alliance were, that Mithridates should be master of the countries which they hoped to conquer, and that Tigranes should have the inhabitants and all the moveable property that he could carry off. Plutarch states (Lucullus, p. 509, Xyly), that the army of Tigranes was composed of 280,000 men—20,000 archers, 50,000 horse, 150,000 foot, and 8000 pioneers and train,—and that Arabs and Cathulcians from the Caucassus abounded in the Armenian camp. The campaign was opened in B.C. 74. Cappadocia and Bithynia were conquered, and Mithridates had siege to Cynocr thoused in Bithynia, but Lucullus came to relieve it, and after various reverses Mithridates was compelled to fly to Tigranes (60). The conduct of the Armenian king had been insen- cere during these events, and, the Romans being more victorious, he not only refused to receive his客户的-in-law, but set a prize of a hundred talents on his head, on the pretext that the king had persuaded him to send his considerable son and his own son to the enemy, rendering his son so顷服* to his own armies to meet Lucullus, who had crossed the Euphrates and to the Tigris, and had laid siege to Tigranocerta, the new capital of the Armenian kingdom. Tigranes and Mithridates having entered into negotiations with Pharnaces III, king of the Parthians, for the purpose of drawing him into their alliance, Lucullus, who had now carried his quest in Armenia as far as Artaxata on the upper part of the Araxes, marched to Mesopotamia to attack the Parthians. But a mutiny of his soldiers compelled him to retreat to Cappadocia, where they dispersed, as it seems: the instigation of Pompey, who aimed at the disbanding the hands of the Romans. Tigranes and Mithridates carried off a great number of the inhabitants of this province, as well as of Cilicia and Galatia. Pompey entered Asia Minor in B.C. 60, and in the same year he defeated Mithridates in a great battle on the Araxes, and the Mithridates, having experienced the faithlessness characterised by his son-in-law, fled to Phanagoria in the island of Tarsus, while Tigranes humiliated himself before the Romans, and then encamped in the neighbourhood of Artaxata. He went to the tent of Pompey, and, kneeling before his victoi- rious enemy, took off his royal diadem, which Pompey however would not accept. The policy of the Romans required an independent kingdom between their dominions and the dangerous power of the Parthians. Tigranes there- fore was reinstated in Armenia, except the districts of Gar- dyene and that of Sophene, or the westernmost part of Armenia Magna, which he was obliged to cede to the rebellious son Tigranes, then an ally of the Romans. Besides these districts, he ceded to the Romans his king- dom of Syria, including Phoenicia and all his conquests in Cilicia, Galatia, and Cappadocia; he paid six thousand talents, and he gave half a mine to each Roman soldier, five mines to each centurion, and sixty mine each to each tribune. (Plutarch, Lucullus, p. 637, Xyly.; comp. Appian, De Bello Mithrid., c. 104.) It seems that all this humiliation Tigranes led an obscure and tranquil life, for his name disappears from history, and the year of =
death is unknown. His successor was Artavasdes. (Mithridat.
Valerius Maximus, V. 1, 9; Velleius Paterculus, ii. 33, 1, and c. 37; Cicero, Pro Lege Maniliu; Woltersdorf, Commentatio Vitri Mithridati. M. per annos digestum, Goettingen, 1812.)

The second Armenia and lord of Sophene was the son of Tigranes, king of Armenia. During the last war between the Romans and Mithridates aided by his ally king Tigranes, prince Tigranes forsook his father and went over to the Romans. When his father humiliated him by giving him no share of the Roman general, but he did not rise before his father, nor did he how him the slightest degree of filial respect. Having been created lord of Sophene and Gordyene, he refused to surrender his provinces in Cappadocia and Mysia. He suspected him of being in secret communication with the king of the Parthians, whose daughter he had married. Tigranes also became suspected of having formed a plan for seizing or putting to death his father, and accordingly he was arrested by order of Pompey, who sent him to Rome. He figured in the triumph of Pompey.

Appian (De Bello Mithrid., c. 105 and 117) states that Tigranes was afterwards put to death in his prison. (Ti-

TIGRANOCERTA (Tryavna/Stra), for some time the capital of Armenia, was built by king Tigranes after he had extended his dominion over Mesopotamia, Syria, and Phoenicia. Artaxata, the old capital on the Araxes, being of a very small position, the Parthian nations, then the allies of Armenia, Tigranes seems to have thought it convenient to have his capital near those countries, which often required his presence on emergencies. As his possession in Cappadocia, this danger arose principally from the neighbourhood of the Tigris, to which the time when Attalus left them his kingdom of Pergamus by testament (a.c. 133), formed a line on all Asia Minor, and at the time of the founda-

Tigranocerta was situated a short distance from the Upper Tigris, on the Nicophrus, a river of considerable breadth, as Tacitus states. Seert or Sered, a tall mound, surrounded by antient ruins, is generally sup-

posed to be on the site of Tigranocerta. Sered is situated in the banks of a small river, the modern name of which is unknown, and which flows into another river of considerable breadth, the Bellis of Haj Khafiz, which has its course south-east of lake Van, and flows into the Tigris. His latter river is called Khabur by D'Anville, but this is a mistake, the Khabur, according to Haj Khafiz, called by Renell, being another tributary river in the same department. The latter, it is supposed that the river Centrites was also called Nicophrus, and this opinion is principally founded in the circumstance of the river which passes Sered being a very small stream, this river being a large and considerable breadth. This opinion however is rejected by Renell, and indeed no ruins have been found on the banks of the Centrites, though it has not yet been shown that there are none. We are likewise ignorant as to the hanges which may have been taken place in the direction of the Centrites, which, after having left the mountains at the village of Kala Zerke, flows through an open and level country at some leagues distance east from Sered. Acc-

Tigrus, and subfamily of the Centrites, is a name given to a tribe of the same, and very strong fortifications; its suburbs contained gar-

dens and fish-ponds. The town was inhabited partly by barbarians, and partly by Greeks, the inhabitants of twelve Greek towns who were transplanted to this country by Tigranes after he had ravaged Cappadocia. The military position of Tigranocerta was admirably chosen. By its situation opposite the passage formed by the narrow valley of the Centrites in the Carduchian Mountains, it commanded one of the most important passes in the valley of the Tigris into Armenia across the Tigris. It was also opposite the gorge in the Cardu-

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TILBURG is an inland town in the kingdom of the Netherlands, in the province of North Brabant and district of Bois-le-Duc: it is situated in a heath on the banks of the river Le, 13 miles south-west, and 13 miles north-east, of Bois-le-Duc, and 38 north-east of Antwerp. It has three churches, a large castle, and 12,000 inhabitants, of whom between 5000 and 6000 are employed in the manufacture of fine woolen cloth and kerseymere. They likewise manufacture a considerable amount of coarse linen for the army. Extensive barracks have been built by the present king of Holland. Lying out of the great road from Flan-

ders to Holland, it is little visited by travellers.

TILBURG POORT (The old fortification on the north bank of the river Thames, opposite to Gravesend, for the purpose of commanding the navigation of the river). It was originally formed as a mere block-house in the time of Henry VIII.; but after the Dutch fleet, under De Ruy-
ter, had advanced into the Thames and Medway in 1697, Charles II. converted it into a regular fortification, to which considerable additions have since been made. The fort stands principally in the parish of West Tilbury, partially in the adjoining parish of Chadwell. It is surrounded by a deep and wide fosse, which may be filled with water when necessary; and its ramparts present formidable batteries of heavy cannon toward the river. The earthworks are very strong; but it has a stone portcullis, the elevation of which renders it a prominent object from the opposite side of the river, which is here about a mile wide. Within the fort are commodious barracks and other structures, and all the garrison and ordnance occupy a large part of a fort-major and a detachment of invalids; and piers toward the river afford facilities for the landing of troops, stores, &c. Owing to the flatness of the shore, the fort is liable to overflowing during floods and spring-tides, and its roof is consequently subject to tide-waters, and is tiling, chiefly of stone. The fort, from the river, is given in No. 120 of the 'Penny Magazine.'

TILE, a kind of thin brick, or plate of baked clay, used chiefly for covering roofs, but occasionally for paving floors, constructing drains, &c. The English name, and those by which tiles are known in other European languages, are derived from the Latin tegula, which contains the same element as tego, to cover. This becomes, in French, tegule; in Dutch, tegel; in Italian, tegola; in Spanish, teja, tegla, or tegilla; and in French, tuile.

An account of the use of tiles among the antients, illustrated by engravings of roofing-tiles found at Pompeii, is given in the 'Dictionary of Greek and Roman Antiquities,' art. 'Tegula,' in which it is stated that roofing-tiles were originally made like bricks, of baked clay (γκρανη), and that Byzas of Naxos introduced tiles of marble about the year 620 B.C. In addition to the superior beauty and durability of such tiles, they were made of much larger dimensions than was practicable in clay, and consequently the errors of their parallel lines might be brought into harmony with the rest of the building. From 50 to 40 ft. square, an expensive and magnificent method of roofing occasionally adopted consisted in the use of tiles made of bronze and gilt. Tiles were originally made perfectly flat, or with nothing more but the hook or notch underneath the upper border, which fulfilled the purpose of fixing them upon the rafters. They were subsequently formed with a raised border along each side, on the upper surface, and this border was made to converge towards the lower end, in order that the raised border of one tile or ledge might not prevent the successive rows of tiles from overlapping each other near. The lines of junction between the flat tiles were covered by small semi-cylindrical tiles, called imbrices, or imbracula, which, extending over the gutter, divided the surface of the roof into a series of channels, along which water descended to the gutter. Both the tegulae and the imbrices terminated at the edge of the roof in ornamental pieces, and the whole appearance of the roof was handsome. Another kind of ornamental tiling, mentioned by Pliny under the name of parvumacrum, consisted of tiles of a semicircular form at their lower edges, which, when laid in overlapping rows, somewhat resembled the feathers in the train of a peacock.

The process of making tiles is so similar to that of brick-making [Brick, vol. v., p. 407], that it will be sufficient to observe that only the best qualities of brick-earth should be fit. Since the year 1830 no excise-duty has been levied upon the manufacture of tiles, the duty having been found very prejudicial, especially after the repeal of the duty on slates, although it produced a very trifling revenue. The roofing-tiles used in this country are chiefly of two in the plane-tiles, which are flat, of a rectangular form, and usually about ten inches and a half long, six inches wide, and five-eighths of an inch thick; and pantiles, which also have a rectangular outline, but in such a manner that, when laid on the roof, the greater part of the tiles form a continuous channel for the descent of water, while one side forms a narrow convex ridge, which overlaps the edge of the adjoining tile. These are usually thirteen and a half or fourteen inches long, and are made at the lower edge, measured in a straight line from side to side. Plane-tiles are made with a hole near their upper extremity to receive a wooden peg, by which they are hung upon the laths to the roof, and are laid either with or without mortar in such a manner that the successive rows overlap each other, and the pantiles have no holes, but are hung upon the laths by ledges formed at their upper edges; they do not require so great an overlap as pantiles, and consequently form a lighter covering. The pantiles are admirably adapted to various kinds of roofing, and the suitable angles of inclination for each, are given under Roof, vol. xx., p. 143. Tiles of a semi-cylindrical form, laid in mortar with their convex or concave sides uppermost, respectively, are used for covering ridges.

Drain-tiles are commonly made in the form of an arch, and laid or bedded upon flat tiles called socles. Some useful information will be found in a paper on 'The Descriptive and Statistical Survey of the County of Kent,' by Mr. Robert D. Martin, which has been recently brought into extensive operation. Pantiles are usually square, and of greater thickness than those used for roofing. In ancient as well as in more recent times paving-tiles were frequently decorated with ornamental devices in various colours, so as to produce an effect resembling that of mosaic.

TLESIESIA, a genus of Polyprias mentioned by Pliny.

TILGATE BEDS. A portion of the great series of clay in the field of Kent and Sussex, called green-sands and the Portland oolite, is thus named by Mr. Mantell, who has described the numerous and interesting organic remains which it contains. The reptiles species are described in Professor Owen's 'Report to the British Association,' vol. xxvii., 1850.

TILLA, the name of a genus of plants belonging to the natural order Tiliaeae. The trees in England are called Lime-trees, in Swedish, Lind, and in German, Linden. They are characterised by possessing 5-petalous deciduous flowers, and a pistil of 10 excentric stamens; and a glose, villous, 1-styled, 5-locular ovary. All the species are handsome trees, with alternate heart-shaped, acute, serrated, deciduous leaves, and fragrant yellowish panedid flowers. The leaves are large, smooth, and white, and their sap possesses a considerable quantity of sugar. They are principally natives of Europe and America.

T. Europea, the European or Common Lime-tree, has peltate, fringed, scales, and compound, acuminate, deciduous leaves, which are smooth, with the exception of a rift at hair at the origin of the veins beneath, and are twice the length of the petioles; the cymes are many-spired, and the flowers are white, in the month of May. This tree is ubiquitous from the Pyrenees to the middle and north of Europe, and into Great Britain, although some doubts have been expressed as to its being truly indigenous. It is however introduced into all British Flora; and there can be no doubt, from wide diffusion, that it is truly naturalised in this country. It was well known to the antients, and is spoken of by both Theophrastus and Pliny. It is a very general favourer in Europe, and is planted in public places, parks, and approaches to residences, in France, Germany, Holland, and Great Britain. For this purpose its large size, handsomely ornamented with some appearance, and profusion of sweet flowers will adapt it. The wood is also in considerable request: it is white, close-grained, soft, light, and smooth, and is used by the cabinet-makers for a variety of purposes; it is easily worked, as well as durable, and on this account has been employed for carving. Most of the fine carvings in this country, as those at Windsor Castle, the library of Trinity College, Cambridge, and at Chatsworth, are of this wood. It is also used for woodwork in the buildings of the bark are very tough, and ropes and mats are manufactured from them. They are employed for this purpose in many parts of England, but in Russia and Sweden this wood is considerably used for the purpose of making bars of iron. The pulp is also used for this purpose the trees are peeled in the beginning of the year, and the bark is steeped in water, after which it is hung up to dry; and the layers of bark, being separated, are cut into ribands for making mats, or the shoots are twisted into these. The Russian manufacture by potters is also the case. The flowers common...
A large quantity of nectar, and exhalate a delicious scent. In this account they are great favourites with bees, and when expanded they are constantly besieged with these insects. The juice is much esteemed by the American botanists. It is also much valued in Switzerland, and the south of Europe. There are several species of this tree in England and Scotland, but they can scarcely be said to be wild. Specimens of this tree exist in the churchyard of Seulits in Bohemia, with its leaves contracted, which have miraculously assumed this character from the time that the monks of a neighbouring convent were all hanged upon them.

All the foregoing species are distinguished by not having nectaries or scales at the base of their petals; there are six other species characterised by possessing nectaries. Four of these are inhabitants of North America.

T. alba, the White or Silvery Lime, has cordate, serrated leaves, unequally at the base, clothed with white down beneath, but smooth above, and four times longer than the petals; fruit ovate, with five obscure ribs. This is the T. argentea of Desfautianes; T. panonica of Jacquin; and T. tomentosa of Moench. It is a native of the woods of Hungary, and is very readily distinguished from the other species by the whiteness of its leaves, which becomes especially evident when ruffled by the slightest breeze. It was introduced into this country in 1767, and there are a great many fine specimens of this kind, found at On-Thames, 60 feet high, and a number at Highclere in Berkshire. T. petiolaris was described by De Candolle from dried specimens sent from him by Odesa, where the tree is cultivated in gardens. The leaves are twice the length of the petals, and their under surface downy like the last.

T. glabra, the Black or Black American Lime-tree, has leaves deeply cordate, serrated, and somewhat coriaceous and smooth; the petals are truncate and crested at the apex, and equal in length to the style; the fruit ovate and somewhat ribbed. This tree is a native of North America in Canada and the northern parts of the United States; in the Southern states it is only found at a considerable elevation in mountains. It is a hardy tree and very valuable. The tincture that it yields is of a dark red color, and has been regarded by some as resembling the tincture of Ebrhart and other writers. It is a native of sub-alpine districts in the north of Europe. In Great Britain it is common in the woods of Essex and Lincolnshire; and Mr. E. Forster thinks it probable that this is the only true English lime.

T. rubra, Red Lime, has cordate leaves, unequal at the base, hairy beneath as well as the petals, with a tuft of hair at the base of the veins; the fruit glabrous and smooth. It is a native of Taurida, and some few species are growing in England. The young branches are of a beautiful coral-red colour, thence it has been called T. corallina. This species is by most other writers considered a variety of T. Europaea or T. grandifolia.

T. platypylla, Broad-leaved Lime-tree, has petals without nectaries; cordate, serrated leaves, downy beneath; origin of the veins, woolly; branches, hairy; umbels, three-flowered; fruit woody, downy, turbinate, with prominent angles. This is the T. grandifolia of Elizhart and Blackwell.
TIL better on plains than hills, and in moist than dry places. The trees may be propagated by seeds, which should be sown as soon as they are gathered; but this is a very slow process, and the more frequent mode of propagating them is by layering. In France a tree is cut down to the roots, and the shoots are encouraged to grow, and in the course of two or three years they may be planted in the positions in which they are to stand. Lime-trees will bear transplanting at a greater age than most trees; when large trees are transplanted, they should have their roots cut round three or four feet from the stem the year before they are taken up. This stunts their growth, and makes them bear removal better.

Loudon, Arbor et Frut. Brit., vol. i. and iv.; Bischoff, Lehrbuch der Botanik; Koch, Flora Germanica; Hooker, British Flora; Don's Miller's Dict., etc.

TILACEAE, a natural order of plants belonging to the syncarpous group of polypectites Dicotyledons. This order consists of trees or shrubs, seldom of herbaceous plants, with simple, toothed, alternate leaves, furnished with stipules. The flowers are axillary. The calyx consists of four or five sepals, which are valvate in aestivation; the petals four or five, with mostly a little petal at their base; the stamens are hypogynous, mostly indefinite, with oval or roundish two-celled anthers bursting lengthwise; the disk is formed of glands, which are equal in number to the petals and opposite to them; the ovary is simple, composed of from four to ten carpels, with a single style and stigma divided into lobes according to the number of the carpels; seeds numerous, with erect embryo, and abundant albumen. This order is nearly allied to Sterculiaceae and Malvaceae, from which it differs in its glabrous disk, distinct stamens, and two-celled anthers. The species, of which there are about two hundred and fifty, are arranged in thirty-two genera, and are generally diffused throughout the tropical and temperate parts of the globe.

Tilacia possess no active properties; they abound in a mucilaginous wholesome juice. The fibres of the inner bark are very tough and are used for a variety of economical purposes. (Tilac.) The wood is generally white, light, and tough, that of *Grewia ceaium* is used for making bows in India. The Trinomalee-wood used at Madras for making the Massoola boats is the produce of Berryia Ammonilla. The Corchorus olitorius is cultivated in Egypt for use as a pot-herb.

TILIGUA, Mr. J. E. Gray's name for a genus of Sau-

TILILLIQUA, Mr. J. E. Gray's name for a genus of Sau-

TILILLING, applied to arable land, is the stirring and preparing of the surface of the soil, so as to render it fit

for the vegetation of the seeds committed to it: its object

also is the destruction of noxious weeds.

The whole art of cultivation consists in tillage and me-

rating, and the profit of the husbandman depends as in the case of labors, on the amount of labors, on the extent of the effects. A defect in tillage will cause a great deficiency in the crops in ordinary years. To ensure good crops, the soil should be in such a state that the roots

and dews may readily be diffused through it. This is only

accomplished by throwing the surface of the soil into layers. It requires great knowledge and experience to give particular soil the exact portion of tillage which is suitable to it. A fine garden-bulth, as it is called, is the most pre-

ferable for bunching soil which has been manured; when they can be brought to such a state that after continued rains the surface dries without forming a crust, and crumbles of its own accord, the tillage has been good; and the deeper this soil is stirred, the more it

produce: but where clay abounds in the soil, and dry weather can be readily pulverised by crushing the dry

clods, and be reduced to the finest powder, too much till-

gage may do more harm than good. The fine clay is soon

converted into mud at the surface when it is rain, but

because it is not sufficiently porous to let the water through it; it dries into a hard crust, which effectually precludes the access of air, and consequently stops the vegetation of the seed. It is only by abundant manuring with organic

substances, by frequently breaking the surface by animal

trampling in clods to cohers can be overcome; and until the

is effectual it is best to stir clay soils as deep as possible by means of subsoil-ploughs, but they should not be pul-

verised so that the water cannot run down through the

the crust, and especially not to remove the crust in such a state of roughness that heavy rains

it with a coat of mud. The clods which are:

surface imbibe the moisture more gradually, fall to pieces, by which the surface of the plants are pushed

and as it were, moulded up. This is partial in winter after a frost, as all clay-land far

aware. It is very easily ascertained whether a soil

bear much tilillage or not. It is only necessary to try some

seeds in the surface; if they burst, or if the seed

breaking the clods, then water it abundantly, and let it dry in the sun; if a crust is formed in drying, that soil

not bear too much harrowing and pulverising, and shou

be left in a moderately rough state after sowing or during the

seed; but if, after it dries, the surface is completely

porous, then the finer the tillage the better the seed v.

vegetate. The whole depends on the ready admission of air or its exclusion. When grass-seeds are sown, the

surface should be well pulverised; but this cannot be done if the soil is apt to run together when much rain has

soon after the seed is sown. Some plants, like beans, v.

force their way through a very hard surface; but some

seeds are too weak to do so, and their growth is nearly

stomented by the least crust on the surface of the preparatory tillage of the soil before sowing the seed, th

is a great advantage in the stirring of it as the plants are growing. On this depends all the merit of the row-culture

for every kind of plant, especially those which have ex-

lent roots or extensive foliage, and which are charac

tivated for the sustenance of cattle. The effect of deep

tillage is here most remarkable. If rows of turnips or

bages be sown at such a distance that a small plough or other stirring implement can be used between them, or

the intervals be stirred more or less, and at different
depths, it will be found that the deeper and more frequent

tillage, until the foliage covers the whole interval,

the bulbs swell to a great size, the heavier and more

abundant the produce will be. It is worth noting as a

the experiment:—Now Swedish turnips or mangold-seed,

in rows three feet apart: let some of the rows be very

kept clear of weeds by surface-hoeing, and the plants be

completely covered with the distance of row-cultivator.

vals be stirred to different depths; some three inches,

some six inches, and some nine inches or more. The

result will be, that the first rows will appear to have

sown much too far from each other, not half the green

energy being made use of, whilst the foliage will be

covered more and more as the tillage has been

deep, and the last will completely cover the whole

intervals. The roots or bulbs will be in exact propor-

tion to the richness of the foliage, and the weight of the deep.
tilled rows will far exceed that of any of the others, while the first will, by comparison, appear a poor and scanty crop, however clear of weeds the surface may have been kept. The soil best suited for this experiment is a good light loam on a dry or rarely wet ground, but forced to moisture under any soil will chill the fibres and check the growth of the plants, however dry the surface may be. It was this which led Tull, the father of drift husbandry, to the conclusion that tillage was all that the soil required to make it fruitful, and will thus stir up the professional far but we shall not be wide of the truth if we assert that with proper tillage the soil will be gradually improved, and a much smaller quantity of manure occasionally applied, the waste produced by vegetation will render the soil more than fertile, and so to that purpose more manure and less tillage; and as tillage can be increased by mechanical contrivances so far as labourers are scarce, whereas the supply of manure must generally be limited, it follows that, as a general rule, the soil should be well and deeply tilled, due attention being paid to the nature of the soil and its property of retaining or transmitting moisture. Very loose sands should not be much stirred until they are consolidated by the admixture of manure and indeed in all cases the manure should be mixed as intimately as possible with the soil, and as deep as the tillage has gone, not including the stirring of the subsoil; for the roots will always penetrate for food and water, which they require. Those plants which throw out roots from the bottom of the stem, as wheat, barley, and oats, require the surface to be most pulverised and enriched to allow these roots to spread; a spring tillage is therefore highly advantageous of one or two weeks before the broadcast seed is deposited in rows by drilling or in patches by dibbling. This last method is found to give much finer crops, from the circumstance that the hoe not only loosens the earth between the rows, but also between the different patches of the growing corn, so that the corol roots are strengthened and the tilling of the stems so much encouraged, that it is not uncommon to see twenty, thirty, or more strong stems all bearing fine ears arising from one tuft of plants, far more seed being sown per acre than roots are mat together and send out fibres in every direction. The crowding of several plants does not prevent their growth, provided the fibres can spread around in a rich mellow soil, well pulverised, and admitting the air and moisture readily.

As a perfect tillage requires much labour and minute attention, and in many situations where the farms are large labourers cannot be procured at moderate wages, nor can they always be depended upon to perform the work with sufficient accuracy. The harrows are the most convenient implements of tillage by which it may be more perfectly accomplished, and at a smaller expense, by using the power of horses instead of that of men, and making implements which will till a considerable breadth at once, and with great effect. The old plough, and which, however it may be improved, still acts on the same principle of turning up a fresh portion of the soil, burying that which has for some time been at the surface, will probably always continue to be the chief implement of tillage; but the harrow operations, which are taken from garden culture, require particular contrivances to effect them by instruments. The harrows are but an imperfect substitute for the garden rake, and do not to the same degree cover the surface, or destroy the weeds which have therefore been invented, which by means of wheels can be regulated so as to act at a greater or less depth. These have received the different names of scariifiers, grubbers, cats-claws, or cultivators, according to the fancy of the inventor. Many of these answer the purpose well, and save labour. They can be used in all directions so as to pulverise the soil to any degree. Heavy rollers with and without spikes around them are used when many clods remain. Tilling several acres of ground in some country, the Belgian trаinеа, a strong frame of wood boarded over, and loaded with weights if required, is a most effectual instrument in levelling the surface and crushing clods, without pressing them into the soil as the rows are being made.

It would be endless to enumerate all the implements of tillage which are daily invented: some of the most useful have already been described. [ARABLE LAND; PLOUGH.]

As the cultivation of the soil approaches more to that of the garden, more perfect instruments will be used; such as can be directed with great accuracy between parallel rows of growing plants without danger of injuring them. When the rows of stabbs are very close, and correspond with the width of the instrument, so that the wheels will run in the intervals and the horses step in the same, the soil may be tilled perfectly, although the rows of plants have but a small interval between them: and the largest and most perfect tilling instruments are for cultivating equal rows of growing plants, as we are accustomed to see in a kitchen-garden. The result will be the same as when for the sake of experiment we sow the common grains and leguminous plants of the fields in a plot of garden-ground and sow them with the same regularity as the rows of cultivated plants. This is said to be a great improvement on our calculation when extended to a large surface, and hence the incredible results which we continually meet with in the reports of experiments on some new produce lately introduced: everything is on a magnified scale, owing to superior tillage. No doubt many fields possessed of fertile soils might, by attentive tillage, be made as productive as the best garden-ground. The Chinese have, as we are told, already accomplished this by their incredible number of labourers, but in this country mechanical contrivance are a substitute for millions of labourers when judiciously applied as our manufactures fully prove. The same ingenuity applied to tillage might increase the produce of land indefinitely, at least far beyond what we may now suspect.

In the early ages of agriculture tillage was almost confined to the ploughing of fallows to clean the land, which was very imperfectly executed, and in ploughing the earth not the instruments were used for the purpose so far as the land would give a return for the labour. The idea of tillage for the sake of a permanent improvement of the soil was only entertained by a few men who reflected, and that of encouraging the vegetation, while the crop was growing was not even then the sight of. The plough, the harrows, and the hoes which were to cover the seed were the only instruments in use, and they were very rude of their kind. A return of three or four times the seed sown satisfied the farmer and the landlord; and yet the first was hardly repaid for his toil, and the landlord received for rent what now would scarcely satisfy the tithe-owner. The present state of agriculture may be contrasted with this, and perhaps hereafter the comparison may be as disadvantageous to us as it now appears in our favour when we look back a few centuries.

TILLANDSIA, the name of a genus of plants belonging to the natural order Bromeliaceae. Linnaeus says of the plants belonging to this genus, Tillandsia cannot bear water, and therefore I have given this name to the genus from a professor who, in his book, The propriest passage from Stockholm to that place, no sooner set his foot on shore than he vowed never again to venture himself upon the sea. He changed his original name for land of, and by land, and yet the first was hardly repaid for his subsequent occasion to return to Sweden, he preferred a circuitous journey of 200 Swedish miles through Lapland to avoid going eight miles by sea. Dr. Elias Tillands, whose name and idiosyncrasy have thus been perpetuated, was professor of physics at Abou, and died in 1692, at the age of fifty-two. He published in 1688 an alphabetical catalogue of plants in the neighbourhood of his residence, which was afterwards followed by wood-cuts of 156 of the plants in the catalogue.

The genus Tillandsia of Linnaeus comprehends the plants described by Sloane as viscum carpillitioides, and by Plumier as Caragata, and is characterised by possessing a persistent calyx divided into three obovate, lanceolate, pointed segments; a corolla tube, which is divided, with the limb divided into three segments; six stamens not so long as the corolla, and inserted into it, and the androgynous; the ovary superior, surmounted by a style with a trifid obtuse stigma; the fruit, a trilocular capsule containing an unbranched stalk of aggregate fibres, which in the end constitutes a feathery wing. The species are most of them parasitical, and are natives of South America. T. utriculata, the pineapple of the colonists of Jamaica, linear, channelled, reserved, dilated leaves, inflated at the base; stem closely pinnate. It is found growing on old and decaying trees in the forests of the Jamaica. The stem is three or four feet high, and the leaves are a yard long.
and placed within one another in such a way that the water which runs down them is retained in their expanded branches. At the bottom of each branch is a reservoir, or swell out, of a bottle, which, being contracted at the neck, prevents the heat of the sun from evaporating the water. These reservoirs will each hold about a quart of water, and during the dry season they are the resort of all kinds of animals for the sake of the water, and there the young are obtainable to be fed with a supply of water from this source when all others fail. Dampier, in his Travels, gives the following account of this plant:—"The wild pine is a plant so called because it sometimes rises to the bush of leaves which surround the true pine-apple. The wild pines commonly grow from some bunch, knot, or excrescence of a tree, where they take root and spring upright. The root is short and thick, from whence the leaves rise up in folds one within the other, and extend to the extremity of the tree. They grow to a good thick substance, and so compact as to catch and hold the rain-water when it falls. They will contain a pint, or a pint and a half, or a quart; and this water refreshes the leaves and nourishes the root. When we find these pines, we stick our knives into the leaves just above the roots, and let out the water, which we catch in our hats, as I have done many times myself to my great relief. The seeds of these plants are furnished with wings, by which they are spread from tree to tree; and they grow in a most dense manner. Unless they possessed such means of transportation, they would fall to the ground, where, being parasitical, the young plants would perish.

T. subeunus, the Long-Moss Tillandsia, or Barbe de Vizcayen, is a native of the forests of North America, from Virginia to Florida, and of the West Indies and the Bahama Islands. It has a very minute root, and its long, red, compacted stems are upon the stems and branches of old trees, sometimes hanging down in a bunch like the hair of a horse's tail. The flowers are small and of a blue colour, and are developed all at once upon the ends of the branches. The flower grows on the trees in dry and arid plains, as well as in alpine districts. It attains a larger size in the more temperate localities. Its filamental stems, when deprived of their bark, may be used for the same purposes as horsehair, and are used in this manner in America. They are also in some places made into cordage. The only preparation they require previous to being used is being put into water for a fortnight or more, according to the temperature, when, on being taken out and dried, the bark easily separates from the stem, and is found fit for use. It has been recommended as a remedy in hemorrhoids, also as an effectual diaphoretic.

T. monostachya, Single-spiked Tillandsia, has the radicle leaves linear, channelled, recurved, and shining at the summit; the flowers are of a white colour, and the scales are imbricated; the spikes simple; the bracteas ovato-concave. This plant is a native of the West Indies. The flowers are of a snow-white colour, appearing in the axils of the bracts, which surround a rachis two or three inches long, and this arises from a mass of leaves arranged in the form of a rosette. As the leaves and bracts are coloured variously, green and red and white, the whole plant looks at a distance like a large flower; and when numerous upon the trees on which they grow, they produce a very handsome and remarkable appearance. The leaves of this as well as most of the other species serve as reservoirs for water. About thirty species have been enumerated by botanists; most of them are inhabitants of South America, especially of Peru, and of the great forests of the Andes; two or three of these species have been found in the southern states of North America.

TILLEMONT, SEBASTIEN LENAIN DE, an historian of considerable note, was born at Paris 26th November, 1637. He was the son of Jean Lenain, master of the requests, and his wife Marie le Ragois. His excellence of character was manifested very early; and even as a child he always abstained from those mischievous pranks in which his companions were so fond of indulging. When nine and ten years of age he was placed under the charge of the members of the religious Society then established in the vacant abbey of Port Royal, and under these instructors he devoted himself to the exercises of learning and piety. His favourite author, while at school, was Livy; a preference indicative of the bias of his mind to historical studies. He studied logic and ecclesiastical history under Bossuet, more particularly ecclesiastical history; and he evinced the earnestness with which he pursued it, and got the knowledge of his instructor to a severe test. He studied the theology of St. Austin, from which, when about eighteen, he turned his thoughts; and at this study of the Scriptures themselves, and of the Fathers and while thus engaged he began to collect the last notices of the Apostles and Apostolical Fathers, and to arrange them after the plan of Usher's "Annotations.

The by no means sharp notions of duty, kept him for some time undecided as to the choice of a profession. At the age of 23 he entered the Episcopal seminary of Beauvais, where he was received with such respect from his reputation for historical knowledge, that, thinking it might be a snare to his future, contemplated leaving it, but was persuaded to remain by Isaac de Stacq, one of the members of the Society of Port Royal, whom he had chosen for his spiritual guide. He remained three or four years in the seminary of Beauvais, and then spent five or six with Godeftoi Hartmann, canon of that city. He was much respected and beloved by the bishop of Beauvais, Chart de Buzanval, and feared that this estimation would make him vain, he suddenly left the seminary, and for two years with his intimate friend and school-fellows at Port Royal, Thomas de Fosse; but not finding in Paris that retirement which he desired, he withdrew to St. Lambert, a country parish in the neighbourhood of that city. In St. Lambert, in 1672, he resolved to become deacon, and fifteen months afterwards deacon. The following extract from a letter addressed to his brother (Pierre Lenain, then or afterwards subprior of St. Trappe) may serve as a prophecy of his piety and his humility. After adding that it was ten years of his consacration, and desire to be of any service to his, he said:—"I am far from those dispositions which I myself should be necessary for entering upon this office; and above all, I am obliged to confess that I have profited little from the grace which I might have received from the order and duties of the deaconship. But on the other hand I could not resist one whom I believe I ought to obey in everything, and who, I am well aware, has the greatest love for me. I beg of you then, my dearest brother, to pray to God for me, and to ask him whether it may be that I shall ever receive from him any such dispositions as the advice of my friend may be for my salvation and not for my condensation."

In a.d. 1676 he received priest's orders, at the further persuasion of de Stacq, who contemplated making him his successor, and who was charged with the office of the seminary. He was dean of the dunes, now re-established in their original seat, the abbey of Port Royal, to the immediate residence of which establishment Tillemont removed. He was however, in 1679, obliged to remove, and he took up his residence at the estate of Tillemont, short distance from Paris, near Vincennes, which belonged to his family, and from which he took his name. In a.d. 1681 he visited Flanders and Holland; and in a.d. 1682 undertook the charge of the parish of St. Lambert, where he had formerly resided, but soon gave it up at the desire of his father, to whom he ever paid the greatest respect and obedience.

Having prepared the first volume of his great work on ecclesiastical history, he was about to publish it when a serious accident occurred to the eye of this very celebrated man, connected with theology, it had to pass, and who raised some objections of the most frivolous character. Tillemont refused to alter the parts specified, deeming them not only just within the province, but also desirous to suppress the work, upon which he laboured diligently, though without any immediate intention of publishing it.

This exercise of the censorship led to an alternation of his plans; he was at first inclined to finish from the rest of his work the history of the Roman emperors and others whose actions were interwoven with the affairs of the Christian church, and to publish it separately; the first volume of this work, which, as not being theological, was exempt from the censorship, appeared in 1690, and even...
received with general approbation. It excited a desire for the appearance of his Church history, and the chancellor Boucherat, in order to remove the obstacle to its publication, appointed a new censor. Thus encouraged, he brought out the first volume in 1693, under the title of 'Mémoires pour servir à l'Histoire,' &c. The author concerns himself chiefly with facts, without entering into questions of doctrine and discipline; and notices not all the saints in their turn to prove that that portion of Scripture are some antient and authentic records. Each volume has notes of similar character to those given in 'L'Histoire des Empereurs.'

Tillemon supplied materials for several works published by others, as for the Life of St. Louis, begun by De Sacy and finished and published by La Chaise; for the lives of St. Athanasius and St. Basil, by Godereoi Hermant; of Tertullian and Origen, by Du Fossé, under the name of La Meuse, &c.,

(Vie de M. Lenain de Tillemon, by his friend Trouchez, afterwards canon of Laval, Cologne, A.D. 1711; Dupin, Bibliothèque des Autours Ecclésiastiques du Dixièmme Siecle; Biographie.)

TILLOCH, ALEXANDER, LL.D., was born at Glasgow on the 28th of February, 1739, and was educated with a view to following the business of his father, who was a tobacconist, and for many years filled the office of magistrate. He had, however, inclined to the pursuit of scientific knowledge than to the business of his birth. His biographer states that in early life his attention was greatly attracted by the occult sciences, and that although he was not long subject to their delusions, he never was inclined to turn away from them. The most celebrated of the earliest subjects to which Tilloch applied himself was the improvement of the art of printing; his experiments have been alluded to in a previous volume. [STEREOTYPE, vol. xxiii., pp. 42 and 43.] After carrying on the tobacco business he entered the law, and at an early age became a brother and brother-in-law, Tillich abandoned it, and for several years exercised that of printing, either singly or in partnership with others. In 1787 he removed to London, and added to his printing by a partnership with other parties, published the 'Star,' a daily evening newspaper, of which he became editor. This office he continued to hold until within a few years of his death, when bodily infirmities and the pressure of other engagements compelled him to relinquish it. The political opinions of Tillich were temperate. For many years he devoted attention to means for the prevention of the forgery of bank-notes, and in 1720 he made a proposal to the British ministry on the subject, which met with an unfavourable reception. He hoped to establish the French government, who were anxious to apply it to the operation of ambassadors; but, after some experiments had been made, and negotiations had been urgently sought by the French authorities, all communication on the subject was cut short by the fall of the ministry, and Mr. Trenchard and the other correspondents. In 1797 he presented to the Bank of England a specimen note, produced by block or relief printing, which was certified by the most eminent engravers to be impossible of imitation; yet nothing was done towards the adoption of his or of any similar plan.

Considering that there was room for a new scientific journal, in addition to that published by Nicholson, Tillich published, in June, 1797, the first number of the 'Philosophical Magazine,' a periodical which has ever since maintained a high reputation as a record of the progress of science, and a digest of the proceedings of learned societies at home and abroad. Of this work he was sole editor for a few years. After the death of Mr. Taylor, when Mr. Richard Taylor, who succeeded him in its management, became associated with him. In the earlier numbers of the 'Star' Tillich published several essays on theological subjects, some of which, relating to the proverbs, were subsequently collected into a volume by another person, and published with the name 'Biblicus.' In 1823 he issued an octavo volume entitled 'Disserationes Introductory to the study and right understanding of the language, structure, and contents of the Apocalypse, in which he endeavored to prove that the Apocalypse was written much earlier than is usually supposed, and before most of the apostolic epistles. His views on this and other points are discussed at length in a notice of this work, published soon after his death, in the 'Eclectic Review.' The last work undertaken by Tillich was a weekly periodical entitled the 'Mechanic's Oracle,' devoted
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principally to the instruction and improvement of the working classes. The first number appeared in July, 1834, and it was discontinued soon after his death, which took place at his residence at Islington, on the 28th of January, 1855.

Tillotsoh married early in life. His wife died in 1793, leaving a daughter, who became wife of Mr. John Galt. His religious opinions were peculiar, and he was one of the elders who acted as ministers of a small body who took the name of Christian Disciples, and had a place of worship in Princeton Street, London. He was a member of many learned societies in Great Britain and elsewhere, and was proposed, about twenty years before his death, as a fellow of the Royal Society of London; but his name was withdrawn from the list by the consequence of his dissertation that he would be objected to, not on account of any deficiency in talent or character, but solely because he was proprietor of a newspaper. A memoir of Dr. Tilloch appeared in the 'Imperial Magazine,' March, 1893, from which, with the assistance of other obituary notices, the above account is condensed. This was printed in the last number of the 'Mechanic's Oracle,' with a portrait.

TILLOTSON, JOHN, D.D. (born 1630, died 1694), a presbyter and one of the most celebrated divines of the Church of England. He was born at Sowerby in Yorkshire, a member of the great parish of Halifax, of a Puritan family. His father, who was engaged in the clothing trade, belonged to that section of the Puritans who were for establishing a general system of Independency, and he belonged himself to an Independent church, of which Mr. Root was the pastor. After having been a pupil in the grammar-schools in the country, the writers of his Life do not hesitate to say that his schools were so mean, but doubtless the grammar-school at Halifax was one, he became a pensioner of Clare Hall, Cambridge, in 1647, and a fellow of the college in 1651. It appears that he remained in the University till 1667. Puritanism was at that period in the ascendancy in Cambridge; but Tillotson very early freed himself from his educational prejudices, became a great admirer of the writings of Chillingworth, and soon showed himself one of a class of persons who were then beginning to be considerable in the University of England, who, taking their stand on the Scriptures, opposed themselves at once to Romanism on the one hand, and to Calvinism on the other. This position he ever after maintained, and his celebrity arises principally from the ability with which he illustrated and defended, both from the pulpit and the press, the principles of Protestantism, and of a rational and moderate orthodoxy. It may be added also, that so much of the effects of his original Puritan education remained with him, that he was never sensible of his own growing learning, although it was entertained and occasionally expressed notions of the duty of submission, which, if acted upon, would have maintained the House of Stuart on the throne.

Before he entered holy orders, he was tutor in the family of Prideaux, the attorney-general to Cromwell. This led to his residence in London, and brought him into acquaintance with several eminent persons. He was thirty years of age before he received ordination, and the service appeared to have been performed with some degree of privacy, as it is, we believe, not known when or where it was performed, and only that the bishop from whose hands he received it was not a bishop of the English church, but the bishop of Galway in Scotland, Dr. Thomas Syderse. At this period of his life he attended Insch College, and his early religious history, for amongst other things it was even asserted that he had never been baptized, were brought before the public by the non-juring party, when they saw him elevated to the primacy, from which Sanchoft had retired.

It is said by his biographer, Dr. Thomas Birch, that he was not perfectly satisfied with the terms of ministerial conformity required by the act of 1662, which restored the bishop of Sodor and Man, and he was reported to the city authorities of Edinburgh in 1666, where he was judged it proper to accept of the terms, and to become a regular and conformable minister of that church.

He was for a short time curate at Chester, and also for a short time rector of Ketton in Suffolk, a living to which he was appointed by the Quakers, and which was received by the Bishop of London. He was in the midst of his Puritan friends. But he was soon called to a wider sphere of duty, being appointed, in 1664, the preacher at Lincoln's Inn, and lecturer at St. Lawrence's Church in the Jewry. Here it was that those sermons were preached which attracted crowds of the most accomplished and learned of the time, and which have been since repeatedly studied by many succeeding divines of eminence, and are at this day the basis of his fame.

The course of his preferment in the church during the reign of Charles II. was—1669, a prebendary in the church of Canterbury; 1672, dean of Canterbury; 1673, a prebendary in the church of St. Paul, and 1677, a canon of Durham. After the death of William of Orange, his son-in-law was made dean of St. Paul's and clerk of the closet; and in April, 1680, he was nominated by the king to the archbishopric of Canterbury, an appointment which appears to have been exerted upon the king. The king had opposed him to a small share of envy from very different parties. The truth is, that besides his eminent zeal as having been the ablest opposer both of popery and rationalism, in a reign when the tendencies of persons in exalted stations were in these directions, he had a strong personal interest in the new king's affections, who was said, on credible authority, to have declared that there was no honest man than Dr. Tillotson, and that he would always be his intimate friend. He was the son of Martin Tserclas, of Tilly. The Tsercles, whose name is also written Tserclisses, were an old Puritan family of Brussels; John, a member of this family, acquired in 1448, the lordship of Tilly, in South Bohemia. John Tilly was born in 1550, at the castle of Tilly, and early entered the order of Jesuits, from whom he accepted the spirit of fanaticism, of blind obedience, and of absolute command, which distinguished him during the 1680s. He was also a member of the imperial cabinet, which early entered the army of Philip II., king of Spain and lord of the Netherlands, and he learned the principles of war under Alba. Requesens, the governor of the Netherlands, Don Juan of Austria, and Alexander Farnese. In the War of the Spaniards against the Protestant inhabitants of the northern Netherlands he acquired that hatred of heretics and that warlike enthusiasm for the Roman Catholic religion, which became one of the most prominent features of his character. Towards the end of the sixteenth century he entered the service of the emperor Rudolph II. and distinguished himself, first as lieutenant-colonel, and afterwards as colonel and commander of a regiment of Walloons, in the wars against the Hungarian insurrections. In 1603, he was commander of the imperial regiment in Silesia, and distinguished himself, at the battle of Sitzbauer in 1606, between Rudolph II. and Albrecht von Wallenstein. He was appointed commander-in-chief of the army to Maximilian, duke of Bavaria, which was in a very dangerous state. In 1609 Tillotson commanded the imperial troops, and he held this high office until his death. Tillotson gained the first great victory in the Thirty Years' War, which broke out in 1618. [Thirty Years' War.] After having conquered the Upper Palatinate with the troops of the Elector Palatine, and the Elector of Bavaria with the Imperial generals to pursue the army of Frederick V., king of Bohemia, instead of taking winter-quarters and thus losing all the fruits of their conquests, Waratah
winter was, in the seventeenth century, a very uncommon thing, and Tilly met with much opposition to his plan; but, by good fortune, he was not stopped, and on 2nd March the war. Tilly attacked the Bohemians, who had taken up a fortified position on the Weisse Berg, near Prague, and in a few hours the Bohemian army was nearly destroyed (8th of November, 1630), while only some hundreds of them escaped over the river Moldau. The Austrian nobles, who lived at Prague or resided in their castles, were warned by Tilly to fly if they would avoid the vengeance of the emperor; but they paid no attention to this generous advice, and were surprised; twenty-seven of them were killed.

After the brilliant victory on the Weisse Berg, Tilly hastened to the Rhine for the purpose of preventing the count of Mansfield from joining the margrave of Baden. He had a very drastic life in this campaign. The margrave of Baden-Durlach was defeated in the defiles of Wimpfen, and defeated, after an heroic resistance (1622).

On the 2nd of June, 1622, he defeated Christian of Holstein at Hochstädt; he pursued Christian and Mansfield to Westphalia; defeated them at Stadlo, near Münster, in a battle which lasted three days (4th to the 6th of August, 1623), and forced them both to disband their troops and to take refuge in England. For his victory at Stadlo, Tilly was rewarded by an immense sum, which he had, related, in the article Thirty Years' War, how skillfully Tilly first weakened and then destroyed the army of king Christian IV. of Denmark, but the principal glory of this campaign was earned by Waldstein, who, after taking Erfurt, entered the town with his four thousand men and Elbe, persuaded Tilly to turn his arms against Holland, and to leave him the conquest of Denmark. After Waldstein had been deprived of his command in 1630, and Gustavus Adolphus, king of Sweden, had landed in Germany. Tilly was appointed field-marshal and commander-in-chief of the imperial army. He appreciated so justly the military talents of his new opponent, that in the assembly of the electors at Ratisbon he declared Gustavus Adolphus to be a man whom he would command; through the influence of this imperial army, was as honourable as to gain victories over other generals.

The first great event of the new campaign was the capture of Magdeburg, on the 10th of May, 1631. The Croats and the Walloons in the imperial army committed unheard-of cruelties against the unhappy inhabitants; 30,000 of them were killed, and the town was entirely destroyed after three days' plunder. It has generally been believed that some Imperial officers besought Tilly to stop the atrocities of the soldiers, and that he coolly answered, 'Let them alone, and the Emperor will not take them.' This story was credited, however severe Tilly was, he cannot be charged with having urged the commission of cruelty, although he considered the plunder of a conquered town to be the fair reward of victory; but, in the 14th century, the blood of the vanquished was for a time the stock-in-trade of Magdeburg. In a letter to the emperor he said that since the destruction of Troy and Jerusalem there had been no such spectacle as that which Magdeburg presented. Six months later Tilly, who was in a fortified camp at Bremen, was abandoned Tilly for ever. driven, by the impetuosity of his lieutenant, Papenhagen, to engage in battle with Gustavus Adolphus before his reinforcements had arrived. Tilly himself was successful in his attack on the left wing of the Swedes, which was broken, and the elector of Saxony, who commanded it, fled as far as Eilenburg. But Gustavus Adolphus, who had beaten the left wing of the Imperialists, under the command of Papenhagen, stopped the progress of Tilly, and after a long and terrible engagement the imperial army was destroyed. When Tilly saw the flight of his soldiers, he swore that he would not survive the day on which he, the victor in thirty-six battles, was to fly for the first time in his life. Alone on the field the old field-marshal shed three tears of despair, and looked for death as his only consolation. However Duke Rudolph of Saxe-Lauenburg persuaded him to withdraw; and Tilly, putting himself at the head of four regiments of veterans, fought his way through Skolz in the escape of the Swedes. He escaped from the bold attack of a Swedish captain, called 'Long Fritz,' who was killed by a pistol-shot at the moment when he was seizing the field-marshal (17th of September, 1631). After the loss of the battle of Leipzig, fortune abandoned Tilly for ever. Although he afterwards succeeded in driving the Swedes from Franconia, Gustavus Adolphus compelled him to retire beyond the Lech. In order to prevent the escape of the Bavarians, he had a body of soldiers placed in a strong position near Rain, on the right bank of that river. Gustavus Adolphus, having arrived on the left bank opposite Rain, opened a fire from all his batteries on the Bavarian camp, while his pontooneers endeavoured to construct a causeway. The Bavarians, on the other hand, put up the most active resistance, but a ball broke his thigh, and he was removed from the field and carried to Ingolstadt. After the fall of Tilly, the elector of Bavaria abandoned his invincible position, and the Swedes crossed the river. He died on the 2nd of May, 1631, in the battle, in his seventy-third year, without leaving any issue.

Tilly was a little ugly man, with red hair, large whiskers, a pale face, and piercing eyes. He continued to lead a rough and turbulent life, and for a long time after the death of his camp; he boasted that he had never touched wine nor women; he spoke little, but thought much; he despised honours and money; the emperor wished to confer the duchy of Brunswick-Calenberg upon him, but Tilly refused it, and he died poor.

(Julius Bellus, Laurea Austrica; Breyer, Geschichte des Dreissigjährigen Krieges; Schiller, Geschichte des Dreissigjährigen Krieges; Leo, Universal-Geschichte; Tilly's 'more literary' memoirs; the German Lutheran is situated in 55° 4' N. lat. and 21° 6' E. long., in a fertile country on the south bank of the river Memel (called in Russia the Niemen). The little river Tilzele (pronounced Tilshefl) forms on the south side of the town a larger stream; it enters the Memel, and drains the town and the suburbs, into the Memel, over which there is a bridge of boats, which is 1150 feet long without the approaches. The thirty-six boats or pontoons are removed at the approach of war in the Tilze, Tilly's Order in Orig.
the heated iron is subjected to a very heavy hammer, the strokes of which not only bring it into a new form, but also force out from its substance considerable quantities of dross. The kind of tilt-hammer formerly used in this process is described by Holland, in his treatise on 'Manufactures in Metal', in Lardner's 'Cabinet Cyclopaedia.' He describes the shaft or helve of the hammer as nine feet in length, and thirty or forty inches in circumference, made of ash, and clamped at intervals with bolts. This shaft was joined to the axis of the hammer, which was a mass of cast-iron, weighing seven or eight cwt., and was secured at the opposite end to a massive collar of cast-iron called the 'hurti,' the projections or pivots of which formed the axis or centre of motion. The head of the hammer was made of wrought or framed work of timber. Above the hammer was placed a very strong but elastic beam, formed of tough ash bound with iron hoops, and against this, which acted as a spring to increase the force of the descending stroke, the head of the hammer was thrown up by the revolution of a ponderous circular frame of iron, with four projecting arms or teeth, which came in contact with the shaft very near to the head of the hammer. This circular frame, or 'arm-case,' was fixed immediately behind the axis of the hammer, and supplied the moving-power. In modern iron-works the shining-hammers are usually formed entirely of iron, the piece forming the actual head of the hammer being inserted into a ponderous cast-iron helve in such a manner that the metal is applied upon wrought iron, which is frequently dispensed with, and the hammer is lifted either by cogs or arms acting upon the extremity of the helve, beyond the hammer-head, or by an eccentric, or centre of motion, which was worked from the opposite side of the helve, between the hammer-head and the axis or centre of motion. Holland represents a tilt-hammer of the latter construction, which is about six tons in weight, and nine feet five inches long from the axis to the centre of the head. The hammer-head and its frame-work weighed about eight cwt. Such a hammer makes about one hundred and fifty strokes per minute.

The tilt-hammers used in the manufacture of steel are smaller and much more rapid in their action. Instead of receiving the impulse of the hammer, the heads of their hammers are set in motion by tappets or cogs striking downward upon the tail of the helve or shaft, which is prolonged beyond the axis. The tail of the helve is thus thrown down forcibly upon an anvil, from which it rebounds with great velocity, causing the hammer to rise from three to seven hundred strokes in a minute. Tilt-hammers are applied with great advantage to the forging of anchors, axles, &c.

The cogs which are impelled by water-wheels, it is advisable to fix the cogs or arms upon a separate shaft, which may revolve at any required velocity without increasing the velocity of the water-wheel itself, by the intervention of suitable cogged-wheels. Without such an arrangement much of the useful effect of the water may be lost, owing to the necessity of urging the wheel to a high speed.

TIMAEUS (Tjamaus), the son of Andromachus, was born at Tauromenium in Sicily, whence he is sometimes called a Tauromenian, and sometimes a Sicilian, to distinguish him from other persons of the same name. The year of his birth was n.c. 352. He was a disciple of Philiscus of Mileus, who had himself been instructed by Isocrates. He was a native of Tauromenium, a tyrant of Syracuse, whither he went to Athens. This seems to have happened in the year n.c. 310, when Agathocles, after the battle of Himera, and before taking his army over to Africa, confiscated under various pretenses the property of his enemies, and endeavored to secure his possessions in Sicily by putting to death or sending into exile such as he thought ill disposed towards him. (Diodorus Sic., xx. 4.) Timaeus spent fifty years at Athens in religion, politics, and literature. About the year n.c. 260, when Athens was taken by Antigonus, and the city was returned to his native country, either to Tauromenium or to Syracuse, where he spent the remainder of his life, and died, n.c. 256, at the advanced age of ninety-six.

This story of Timaeus, the main subject of which was a history of Sicily. It began at the earliest times, and brought the events down to Olympic 129 (n.c. 254), where the work of Polybius begins. (Polybius, i. 5.) How many books the history contained is uncertain, though we know that there were more than forty. It appears to have been divided into large sections, each of which formed in itself a separate work, whereas they are spoken of by several writers as so many independent works.

Thus one section bore the title of Euxiai eis Tarchale and contained the early history of Sicily in connection with that of Italy; another was called Euxiai eis Tarchale and contained the history of Sicily and Greece during the time of Agathocles and Alexander; and a third, which after it was finished when it was read, was regarded as a separate work, contined the history of Agathocles, and the last the history of Pyrrhus, especially his campaigns in Italy and Sicily. This last section was, according to the testimony of Cicero (De Fin., v. 12), divided into nine books, of which nothing remains; though as it has been preserved when it was comprehended, it may be viewed as a continuation of the great historical work.

This history of Timaeus, which, with the exception of a considerable number of fragments, is now lost, was commenced by him during his exile at Athens of an advanced age; but he did not complete it till after his return to his own country; and it was here that he added the history of the last years of the reign of Agathocles and wrote the history of Pyrrhus. As regards the character of the work, it was said to have been written with a certain bias or a tendency to the interest of the writer, which Timaeus himself had for censoring others and for having drawn upon him the nickname of Epictates (fault-finder). (Athensius, vi., p. 272.) Most parts of the severe criticism of Polybius may be perfectly just; but a regard to others we should remember that these two historians wrote their works with such totally different views, that the work of Timaeus, who knew the world only from his books, must in many respects have appeared absurd to the author of a 'pragmatical' history, and to a systematic and scientific writer. Polybius, however, wrote his work, as far as we can judge from the fragments, is justly censured by some antient critics for its rhetorical and declamatory character; although others, like Cicero (De Orat., ii. 4; 6; I. 4; &c.), speak of him as very useful. Even the first Greek historian who introduced a regular system of chronology, that is, he regularly recorded events according to Olympiads and the archives of Athens; and although, in the early period of his history, his want of criticism led him into gross chronological errors, he is an example which others found very useful and convenient. It must have been with a view to an accurate study of chronology that he wrote a work on the victories in the Olympic Games, of which we still possess a few fragments.
as an abridgment of the Glossary of Timaeus, if Phthis, who must have had the genuine work before him, did not describe it as a very little work (Boeot. xero 3170 1 x

Pausanias that Ruhmkorff owns that he has not discovered in it a single instance of a word or a phrase being explained incorrectly. There is only one MS. of this Glossy, which appears to have been made in the tenth century of our era, and which was unknown until Montfaucon drew attention to it. It was first edited, with an excellent commentary, by Ruhnken, at Leyden, 1754, 8vo.; a second and much improved appearance in 1789, 8vo. Two other editions have since been published in Germany, with additional notes by G. A. Koch (Leipzig, 1828 and 1833, 8vo.).

Suidas (φ. θ. Τιμαίος) ascribes to Timaeus, the Sicilian historian, a rhetorical work, called Σωλλός, *προφήτης ἀγαθός*, in sixty-eight books, which Ruhnken, with great probability, attributes to Timaeus the Sophist, who wrote the Glossary to Plato.

(Ruhnken, Prae Figatio ad Timaei Glossarium Platoniseum.)

TIMAEUS (Τιμαίος), of Locri, a Pythagorean philosopher. He was a contemporary of Plato, who is mentioned among his pupils, and is said to have been connected with him by friendship. (Cicero, De Finibus, v. 21; De Re Publica, 1. 41, 2. 31, 4. 25, which is called after him Timaeus (Tennemann, System der Platonischen Philosophie, i. p. 93, &c.). Separate editions of it have been published by D'Argens, at Berlin, 1702, 8vo., with a French translation; and by J. J. de Géler, at Leyden, 1750, 8vo.

This Timaeus of Locri is said by Suidas to have also written the Life of Pythagoras; but the usual carelessness of Suidas renders this a doubtful point, as he may possibly have confounded the Locrian with the Sicilian Timaeus, who in all probability has not existed. The History of Pythagoras at considerable length.

(Fabricius, Biblioth. Graec., iii. p. 94, &c.; Gellner, De Situ et Origine Syracusarum, p. 200, &c.)

TIMALIA, a genus of birds characterized by Dr. Horsfield.

Generic Character.—Bill strong compressed, deep (alutum). Nostrils subrounded. Wings short, rounded. Tail elongated and graduated. Feet strong: hind-claw twice as large as the middle claw.

Dr. Horsfield states that a peculiar character is exhibited in both the species of Timalia recorded by him, in the structure of the plumes, which cover the back and the upper parts of the neck, as well as the breast, belly, vent, and thighs. He remarks that the separate filaments (radii of Illiger), which constitute the vanes or webs of those plumes, are not in close contact, as is generally the case, but, being inserted into the shaft at a small distance from each other, they diverge with perfect regularity. The parts which they cover, says Dr. Horsfield in continuation, are accordingly marked with delicate parallel lines, and wherever several plumes lie over each other, they form a beautiful reticulation. On the posterior part of the abdomen, the vent, and the thighs, the plumes have in his great hissings the same character, being elongated and pendulous, so as to envelop those parts with a lux plume covering, which on near inspection appears covered with delicate hairs. This appearance is produced by a series of very minute parallel fili, on each of the separate filaments, arranged with great regularity and beauty. Plumes in which this structure can be discerned with the naked eye are named decompound by Illiger, and described as those whose radii are pinnate with slender laterals. The arrangement of those decompound plumes has in the appearance of the bird is exhibited with accuracy both in the figure of Timalia piletta and Timalia galula.

Example, *Timalia piletta.*

The plumage of this species is rather stout. General colour above, brown with an olivaceous tinge; underneath, testaceous inclining to grey. Head capped with saturated chestnut. Throat and cheeks white. Breast white inclining to grey, marked with intensely black stripes by the shafts of the plumes. A narrow white band commences at the forehead, near the base of the bill, passes backward, encircles the eye, and unites with the white plumes of the cheeks. Axillae white; which colour also shows itself in a narrow border of the wing. Quills and tail-feathers of a more pure brown colour than the other parts; very narrow transverse undulations, of a darker colour, observable on the tail-feathers by close examination. Plumage of the hypochondriae, thighs, and vent, long, pendulous, decomposed, and villose. Lesser wing-coverts, as well as the plumes which cover the nape and back, greyish-blue at the base; which colour shows itself on the separate filaments or radii, if the plumes are accidentally deranged. Tail underneath brown, with a hoary tinct. Bill black and shining. Feet brown. (Hor.'

Locality, Habits, &c.—Dr. Horsfield observes that the species is not uncommon in the groves and small woods which abound throughout Java. It often, he says, approaches villages and plantations, constructing its nest in the hedges; and he speaks of it as one of the social birds that delight to dwell in the vicinity of cultivation. In large forests he did not notice it. He describes its flight as low and interrupted, and adds that wherever it resides it is a welcome neighbour, in consequence of the peculiar beauty and pleasantness of its note, which consists of a slow repetition of the five tones of the diatonic scale (c, d, e, g, a), which it chants with perfect regularity, several times in succession, and at small intervals of time. Dr. Horsfield further remarked that the sixth tone was sometimes added; but as this required apparently an extraordinary effort, it was by no means so agreeable to a musical ear as the simple repetition of the five notes, which appeared to be the natural compass of the bird's organs. (Zoological Researches in Java.)

Timalia piletta. (Hor.)

TIMALIARAE. Mr. G. R. Gray's name for his third sub-family of *Trididei*. [TETURAL; TIMALLA.]

TIMANEES. [SIEHA LERON.]

TIMANYTHES, a native of Sicyon or of Cythnos, was one of the most celebrated painters of Greece; he was contemporary with Zeuxis and Parrhasius, and lived about 480 B.C. The works of Timanthes were distinguished particularly for their invention and expression, and one of the chief merits of his invention was, that he left much to be supplied by the imagination of the spectator. There is a remark in Pliny (Hist. Nat., xxxv. 36), probably a quotation, which bestows the highest praise upon Timanthes: it says, though in execution always excellent, the execution is invariably surpassed by the conception. As an instance of the ingenuity of Timanthes' invention, the same writer relates how a painter displayed us a picture of a sleeping Cyclops, painted upon a small panel, but in which the painter had conveyed a perfect idea of the giant's huge size, by adding a few ans* measuring his thumb with a thrysus.

Though Timanthes was certainly one of the greatest painters of antiquity, antiquity authors have mentioned only five of his works: Pausanias makes no mention of him at all, and Cicero classes him among the painters who used only four colours.* He painted a celebrated picture of the

* See *Dictionary of Greek and Roman Antiquities*, art. *Color.*
stoning to death of the unfortunate Palamedes, the victim of the ignoble revenge of Ulysses for having proclaimed his apparent insanity to be feigned: a subject worthy of the pen of a great master. This picture is said to have made Alexander shudder when he saw it at Ephesus. (Tzetzes, Chil. viii. 198; Junius, Cat. Artif., v. Timanthes.) Timanthes entered into competition with Parrhasius at Samos, and gained the victory; the subject of the paintings was the contest of Ajax and Ulysses for the body of Hector. His most celebrated work however was that with which he bore away the palm from Cototes of Teos; the subject was the Sacrifice of Iphigenia; and perhaps no other work of antient art has been the object of so much criticism, for no one ever quarrels, on account of the concealment of the face of Agamemnon in his mantle. The antients have all given the incident their unqualified approbation, but its propriety has been questioned by several modern critics, especially by Falconet and Sir Joshua Reynolds; Fuseli however, in an elaborate and excellent criticism in his first lecture, has probably finally settled the matter in favour of the painter. The Sacrifice of Iphigenia was given as the subject of a prize-picture to the students of the Royal Academy; and had all the candidates imitated the 'trick' of Timanthes, as Sir Joshua Reynolds terms it, which was the origin of his criticism upon the subject in his eighth lecture; he says, 'Supposing this method of leaving the execution of a grief to be performed by it, it would not be, the invention of the painter, and that it deserves all the praise that has been given it, still it is a trick that will serve but once; whoever does it a second time will not only want novelty, but be justly suspected of having recourse to it.'

The shallow remark of Falconet about Timanthes' exposing his own ignorance by concealing Agamemnon's face, is scarcely worthy of an Allusion. It may be questioned whether Agamemnon, under such circumstances as he was placed, could have been well represented in the face of the Artist. Accurately, most of the antients, and all the candidates imitated the 'trick' of Timanthes, as Sir Joshua Reynolds terms it, which was the origin of his criticism upon the subject in his eighth lecture; he says, 'Supposing this method of leaving the execution of a grief to be performed by it, it would not be, the invention of the painter, and that it deserves all the praise that has been given it, still it is a trick that will serve but once; whoever does it a second time will not only want novelty, but be justly suspected of having recourse to it.'

There was another antient painter of the name of Timanthes; he was contemporary with Aratus, and distinguished himself for a painting of the battle of Peloponnesus, in which Aratus gained a victory over the Persians, Olym. 137. It is said that the battle was not only one of the most difficult to paint, but none of these come into competition with the best timber of the Baltic or of our North American possessions. The timber of the north of Europe is generally of excellence.
In 1797 the duty on foreign timber was reduced—by 6s. 6d. to 4s. 6d. It was raised at different times, until, in 1804, it amounted to 25s. In 1810 the duty was raised to 54s. 8d.; and from 1814 to 1820 it was 64s. 11d. and 65s. The trade. In colonial timber had scarcely any existence before 1798, although until 1798 it had been admitted free of duty; and the average imports in that year was only 3 per cent. ad valorem, which was changed in 1803 to a specific duty of 2s. The consequence of the war there was a great rise in the price of colonial timber. A normal average price of 320l. the load. In order therefore to encourage the supply from our own colonies, North American timber was again, in 1806, admitted duty free. The stimulus was no doubt justifiable, but it was continued after the temporary causes in which it originated had passed away. The following table shows the effect of the differential duties in substituting colonial timber for that of the north of Europe:

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The return to a sounder principle of taxation has been very slow. In 1821, in consequence of recommendations from both Houses of Parliament, the duty on European timber was reduced from 6s. 8d. per load, and a duty of 10s. was imposed on colonial timber, leaving a preference duty of 4s. 8d. in operation. In 1831, the government of Earl Grey proposed, by gradual reductions, spread over three years, to lower the duty on European timber 15s. aside, so that it would cost 40l. 8s. 4d. per load less than colonial; but the measure was defeated in the House of Commons by a majority of 236 to 190. A committee of the House of Commons which inquired into the timber duties in 1835, recommended a very inadequate reduction (similar to that proposed by Earl Grey's government), but it was not followed by any result; and in 1841 the government of Lord Melbourne proposed a reduction from 53s. the load to 45s. on foreign timber, and an increase from 10s. to 15s. on colonial timber. Both parties were divided as to whether the reduction would be fairly compensated; and although the amount of this alteration was not in itself extensive, in the tariff of 1842 (§ 6 Vict., c. 47), the duty on colonial timber has been reduced to a merely nominal sum, namely, 1s. 1d. on the load, and 2s. on deals, and 4d. on lathwood. The reduction on foreign timber is partly prospective. Until the 10th of October, 1843, the duty will be 30s. the load on timber, and after this date 25s.; on foreign

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custom of certain parts of England, considered as timber-
trees, and being thus in building. (Cruise, Dig., l. 3, c.
2 & 3, 67.) Most of the cases upon the question as to
what trees are to be considered timber, have arisen in re-
ference to the stat. 46 Edw. III., c. 3, whereby it was
enacted that great or gross wood of the age of twenty,
the timber for the time being to be considered, though
not to be titheable, but that sylva cedâs, or underwood, should be titheable.
Lord Coke says that two doubts arose on the construction of this statute: first, what should be considered as high or
great wood; and secondly, of what age those gross or
timber trees should be. The answer was, that in this
case the act word gross signified such wood as had been or was, either by common law or the custom of the
country, timber; for the act did not extend to other
woods that had not the quality of greatness or the price
of timber, though none of the signers of the act thought
of the greatness or greatness of timber.
As to the second question, of what age those gross or
timber trees should be, the statute resolved this doubt in
these words: 'Great wood of the age of twenty years or
upwards,' which words were considered as declaratory of
the common law on the subject. (2 Inst., 642, 643;
3 Rep., 12.) It appears now to be settled, though there
have been contradictory decisions on the point, that trees of
the growth of twenty years and upwards, sprung from old
stools or stools, are so considered. As to the first point of
this statute it is enough to say, that the timber is not
and consequently are to be considered as timber. (4 M. &
C., c. 600.)
The timber-trees growing upon land belong to the
owner of the inheritance. A tenant for life has the
right to cut them, in so far as they afford him
shade and shelter, and a right to take the mast and
fruit. If the tenant for life sells timber-trees on the land to any amount
greater than he is entitled to as estovers, that is to say, the allowance for the
profit of the rent of houses and fences, he becomes liable to an action of waste;
and the trees, which by these or any other means, accidental or otherwise, have become severed from
the land, may be seized by the owner of the inheritance,
or by the lessee, if the lease be for life, or by T. and
G.'s at Court. (Perf. 68. 267.) If, however, the estate of the tenant for life be
without impeachment of waste, he has the full right to
fell timber, and also the property in all timber-trees felled
and blown down during his life.
The Crown of Chancery has sometimes directed the
timber growing on an estate, whereof a person was tenant
for life, to be cut down, for the purpose of paying debts
and legacies charged upon the inheritance. (2 Vern., 152.)
The Crown of Chancery has also directed timber in a state
of decay to be cut down for the benefit of the person
entitled to the inheritance, provided no damage were done
to the tenant for life. (2 Vern., 218.) The practice in
these cases is to order the money arising from the sale of
the timber to be invested, and the interest of it paid to
the tenant for life.
In leases for lives, when timber is included, if the lessor
fells the trees, the lessee may maintain an action of trespass
against him, because the lessee, though he may not
cut down the trees without being subject to an action of
waste, has an interest in them for shade and shelter, and
a right to take the mast and fruit, and may also top them if
they be not thereby injured. But where the trees are
accepted in a lease, which is usually done, the lessee has no
interest whatever in them, and the timber may be brought
into an action of trespass against him if he sells or damages them.
The lessee has also a power, incident to the exception,
of entering on the land in order to fell and take away the
trees. By the same power, for the sake of avoiding questions,
is often expressly reserved.
The timber growing on copyhold estates is, by the
general custom of most manors, the property of the lord,
who may cut it down, provided he leaves a sufficient quantity for
the support of the copyholder, which is also entitled to
common right. But the general right of the copyholder to have timber for the reparation of houses
and for ploughbôte and hedgebôte may be restrained by
custom, namely, that he shall not take it without assign-
mment from the lord or his bailiff. (11 R. 20, 66.) Where
the custom of the manor is that the copyholder shall em-
ploy the timber cut down in the reparation of his tenen-
tments, he may sell the tops and bark towards defraying
the expenses of the repairs. (3 Buls., 282.) A copyholder in
fee may, by the particular custom of the manor, have a
right to cut timber-trees growing on his copyhold and
sell them at his pleasure; and the same right may belong
by custom to a copyholder for life, who is entitled to
minate his successor, as being a quest copyholder in the:
but a custom that a copyholder for life may cut down
timber is unreasonable and void, contrary to the
inheritance and the nature of a life
estate.
Ecclesiastical persons being considered in most respects
as tenants for life of the lands held by them jury assessors.
A part of the wood which the owner may cut down
without the consent of the patron and bishop, is enabled to
the moneys paid by the sale of timber cut from the glebe-lands of such benefice, either for
expenses or by sale, purchased by him under the statutory powers vested in him for such purposes.
Trustees to preserve contingent remains are bound to
preserve not only the limitations of the settlements upon
which they are trustees, but also the inheritance of the
owner to cut the timber on the estate.

TIMBREL, a musical instrument of the highest antiquity;
the lypanum levae of the Roman poets, and, in the opinion of all writers of any authority, the
same as the lute, as the copyholder, or as any part of
Europe under the names of labor, tambourine, tambour, Busque, &c.

TIMBUCTU (TEMBOCTU, TOMBOOKTOO, &c.), is placed by Mr. Arrowmith, after careful research
and observation, of routes, in 17° 8' N. lat. and 14° 20' W. long. Mr. M'Queen, to whom we are so much indebted for the extension and correction of our geographical
knowledge of Africa, had placed it in 17° 40' N. lat. and 2° 30' W. long.; but readily yields the palm of accuracy to
Mr. Arrowmith. (P. 1. 144.) The position assigned by Mr. Arrowmith may be accepted as
being exact as can be obtained until the point is fixed by astronomical observations on the spot: or even then,
unless they may be made by more competent observers than us, the discrepancies among the statements of those who
have attempted to ascertain the positions of places on the
Lower Niger should some or all of these gentlemen have been.

The position of Timbuctú is one which is most impor-
tant to have ascertained, not merely on account of its being the
centre of so many routes, and therefore a useful starting-
point whence to calculate the horizontal bearings and
distances of many places; but as being, what the
consequence of so many routes may have shown, the index of the comparative elevations,
the position assigned by Mr. Arrowmith may be accepted as

The rude map of the northern curve of the Kowara by
the schoolmaster of Sultan Bello, the sketch of the position
of Timbuctú given to Mr. Park by an old Senoma Man,
and the delineation of Mr. Timbuctú by H. H. v. M. and
W. R., all concur in representing the Niger at the most northern
point of its course as forming a great curve—flowing fast
to the north, then to the east, and ultimately to the south. The
diagram of modern English travellers on the Upper and
Lower Niger places it beyond these limits, and our
presentations must be in the main accurate; and
the routes between a great number of different places obtained
from Arab travellers from the coast-towns of Marocco, Al-
geria, and Timbuctú, and the natives of the interior themselves, all harmonize with and
 corroborate these conclusions. It is because the statements
of M. Caillié agree with this view that we feel assured he
has not intentionally deviated from veracity, and because we
place a reliance on his accuracy and the evidence of individual places and persons which
we cannot mean accord to his bearings and distances.

Timbuctú appears to stand on the dechivity of an incon-
siderable eminence about eight miles north of the Niger.
"Nothing," says Caillié, "is to be seen in all directions.
but immense plains of loose shifting sands of a yellowish-white colour. From the point where Caillé quit the Niger, to Cabra, the port of Timbuctu, a distance of three miles, he passed along a narrow canal, and as he approached that to the right of him he halted the camels along by a rope, as the pole would not have been sufficient to move it, the natural inference is that he was proceeding up the stream. Between Cabra and Timbuctu he passed two lakes. These appearances coincide with the statements of Arabans, that during the rainy season with a stream of water, extends from north-east of Timbuctu, and, passing to the south of that town, disembogues into the Niger to the south-west of it. The same authorities mention a number of similar lakes which, during his stay in the town, were present. The structure of the plain on which Timbuctu is situated has rendered that site from a remote antiquity the meeting-place of so many converging lines of traffic. It is the nearest point at which the traders from the commercial districts of the west meet those of the south, and the supplies of war-food, rice, verdigris, indigo, gum, barca, and of the Atlantic north of Cape Nun, can strike, after crossing the great desert, the fertile lands extending to the south-east and south-west along the Upper and Lower Niger.

In addition to the settlement in those regions as early as the year 950 of the Hejira (A.D. 1254), and that it soon became the capital of a powerful state. Seeing however that Ptolemy places towns of the name of K-dpa (Káse) and Négira Metropolis (Nya-man, Mann), it is possible the limits of Timbuctu, and the latter somewhat to the east, at the confluence of a tributary with the Niger, there can be little doubt that the town built by Mansa Suleiman was not the first important commercial station in those regions. Indeed an author quoted by Cooley (Negroland of the Arabs, p. 68) would lead us to believe that a town bearing the name Tombuti existed in those regions as early as the year 150 of the Hejira. Rulers with the title Mansa continued to govern Timbuctu from the time of Mansa Suleiman.

The chief of Marocco and Feth rendered Timbuctu tributary, and from that time the communications of the Arabs with that country became more frequent and regular. Leo Africanus mentions that the great marechaussee of Timbuctu was built by an architect from Granada. The Arab conquerors allowed however the native dynasty to remain on the throne. The expulsion of the Arabs from Spain, and the weakening of the Arab power in North Africa by the Turkish conquests of Tunis, Tripoli, and Algiers in the course of the fifteenth century, increased the impurity of the predatory nomadic hordes; and about the same time, or a little later, the formation of settlements on the west coast of Africa, first by the Portuguese and then by the French, the latter gaining a new line of traffic with the interior, diminished the importance of Timbuctu as a commercial entrepôt. About the year 1500 a negro general of Souni, king of Timbuctu, raised the standard of revolt on the death of his master. The British conquerors of Timbuctu were a numerous party of the neighbouring provinces, and recalled to Timbuctu a part of the trade which had left it for Jenne on the Niger. When Leo Africanus visited this part of Africa, the territories of Abu-Bekr-Ishieh, of the king of Timbuctu, the kingdom of Bambara; for Muliah Ashaid, of Tadif, having driven Sid Ali of Suz from his territory, the fugitive was protected by the king of Bambara, and created by him commandant of Timbuctu. Sidi Ali made his peace with Mullah Ismail, successor of Mullah Ashaid, and the consequence was that Timbuctu became tributary to the prince of Tadift. This connection terminated with the death of Mullah Ismail (1795), and since that time Timbuctu appears to have been governed by a negro ruler, that is, by one who is neither an Arab, nor a Tuareg, nor a Fellaheen. The security of person and property, and the commerce of Timbuctu, appear to have fallen off since the accession of a negro chief.
Cooley, Negroland of the Arabs; Travels of Park, Lyon, Don Juan, Eyre, Cuilla, &c., &c.

TIME. This word may be considered either with reference to our abstract idea of the thing signified by it, or to the measures of it which have been contrived for use in the business of life. Something on the first point of view will be said in the article Space and Time, to which the following may be added.

When we think of time in the usual manner, it is of a real thing external to ourselves, which we cannot help imagining to have an existence and a measure, both of which we have been comprehended in a consideration of events. The after-selves of our present events who now speculate upon the conception were annihilated. A little more consideration shows that we are indebted for the idea to successions of observed events, or at least for the power of assigning them to external objects. No description can be adequate; if we say that change necessarily implies time, and that the perception of that which is different from that which was, suggests the notion of an interval, we see that we have already fully assumed the idea of time in the words is and were. But we may say that space and the objects which fill it exist independently of ourselves, and would undergo changes though we were not in existence to perceive them, and that therefore the times which those changes require would also exist; this inverts the order of the most abstract part of metaphysics, and is much beyond the scope of our article. We shall therefore turn to the mode of measuring time; we have a thorough conviction that time is a magnitude, that is, can be found in the external world. We may find the first instance what we mean by a greater or a smaller one.

In the perception of time as a magnitude, that is, of intervals of time as containing more or less of duration, we refer to that first instance to exhibit derived from a continual acquaintance with those great natural successions on which the usual actions of our lives depend, with which we can constantly, though unconsciously, compare the duration of our thoughts and ideas; to more an absolutely long or short time than there is an absolutely great or little space; these words are only comparative. If, for example, any one were to affirm that the universe was continually growing less and less, all its parts altering in the same proportion, and the dimensions of the human race with the rest, in such a manner that the whole solar system would now go into a nut-shell, such as nut-shells were a thousand years ago, it would be impossible either for him to prove it, if true, or for him to prove the contrary, if false, in like manner if any one were to say that the revolutions of all the heavenly bodies were continually accelerating, but that the properties of matter were also continually altering, and that revolutions which agreed in time, and which ideas are connected, and muscular efforts made, continually increased; it would be impossible to prove a contradiction. The oriental story is the best illustration of this: — A prince was ridiculing the legend of Mohammed being taken up an angel, and holding many long conferences with his Creator, and having many views of heaven and hell to the smallest details, in so short a time, speaking with reference to things upon earth, that on his being brought back, the water had not quite flowed out of a jug which he had dropped from his hand while the angel caught him. A magician at the court of this prince ridiculed his laughter by offering to prove the possibility of the story, if his height would only dip his head into a basin of water. The magician, and the magician's horse, who had been immersed, found himself lying by the sea-shore in a strange country. After a reasonable quantity of malediction upon the magician, he found himself obliged by hunger to go to a neighbouring town, and seek the means of support. In time he became independent, and married, and reared a family, but was gradually stripped of all his substance by losses, and buried his wife and children. One day he threw himself into the sea to bathe, and on lifting his head out of the water, found that he had only lifted it out of the basin, the magician who had promised to have been with him, and who had been standing round. On his bitterly reproaching the magician, the latter assured him, and was confirmed by all the bystanders, that he had done nothing but just dip his head into the water. The magician expressed no more doubts about the story of Mohammed, and however much any reader of the two tales may think that neither is true, little reflection will show that either might be so. Perhaps the author has been suggested by what is known to take space away from the time, or a second or two by the pendulum. [D. J. 19, p. 14, a.]

In the flow of motion itself there is no moment at which it took cognizance of time; a particle of matter continued to describe equal spaces in equal times, unless acted on by force from without. Yet it would be possible to state the case in such a manner, to be inserted at the end of the comparison of quantities of duration. If it were acted on by no external forces, are at A and B at the same epoch of duration, and at B and C at the same subsequent epoch, then if A C be n times A B, and if C be a t time, A or B, the motion must of necessity be invariable, and the character of the instant. The mathematician readily sees that the equations of motion do not depend upon the absolute recognition of time as a measurable quantity, but that any moving particle as A, being acted on by no force, the distance A C, described in the time t, might be introduced into all formulae instead of the time, without any question as to whether, time being physically considered, the space A C varies as the time. It is enough that the quantity named time and space be connected with that of the standard particle by the above law described. But though we can thus avoid the idea of measurement of time, we cannot get rid of an existence or of the notion of succession of epochs, just as the quantity of fluxions, fluxions in their nature, are connected with that of the standard particle by the law above described. But we can get rid of these intruders, the theory of limits, which the notion of fluxions immediately requires, was attacked, so that is giving up all the following quantities, to but variable quantities. We cannot take an average of the systems which have superseded that of Newton. The variation means change; it is not pretended that a variable has two values at once. All the different cases by Newton the same principle are in general considered, and considered by Newton, but the modern principles of fluxions in thought of a larger quantity to a smaller, or vice versa, taken in all and the other afterwards. If so slight a difference as this be worth a contest, the distinction of the principles of science must be trivial enough: the fact is that both systems consider successive values, and succession is n. If two computers were to quarrel which was the poor arithmetician, the one who stood still and counted the rages they passed by, or the other who walked on and counted them as he stood still, he would, to us, much resemble some of the disputants against the principle of fluxions.

The actual measure of time depends upon our benevolence to secure successions of similar events which shall form epochs defined by equal intervals of time. We must do this by our thoughts, except approximately, and in short periods. The memory of a man is used to sentiment or feeling of time which is part of our emotions, who die, and traced out a family which could not well perceive the division of the into eight parts at least would make a poor browser for an orchestra. As to the judgment of considerable parts of time, it is materially influenced by the style of conversation which has been the other countries through weariness has been long, and the contrary grounds already alluded to. Thus a year of nature may be truly, to the thoughts, of a different length than what may be called one. Of course, if his having passed quickly or slowly, we spoke not of the but of our mode of remembering it. A person of
recapitulation always says that time has passed quickly, another of a contrary habit the contrary; and this whether the laziness is a consequence of quickness of ideas, or of having little to do. In all the more correct machines which have been invented to measure time, there is but one principle: a vibration is kept up by the constant application of forces only just sufficient to counteract friction and the resistance of gases, and machinery is applied to register the number of vibrations. The remarkable law noted under Isochronism and Vibration makes it comparatively immaterial whether the vibrations are of precisely the same extent. But according to the way they have to respond to the motion of the heavenly bodies, there would be an interval of time. And even in astronomical phenomena there is no absolute recurrence at equal intervals, though nearly enough for common purposes. The value of such phenomena for the most accurate measures consists in most of their irregularities being truly distributed about a uniform mean, so that the excesses of some periods are compensated by the defects of others, giving, in the long run, power of determining that mean with as much accuracy as our modes of measuring long periods require. The same is true of the civil reckoning may be divided into two parts: first, the mode of making the different periods derived from the sun and moon agree with each other so as to afford an easy mode of reckoning [Powers or Revolution]; secondly, the mode of procuring true and convenient subdivisions of the natural unit consisting of a day and night. To the second of these we now turn our attention. The celestial revolution of the earth, as measured by the time elapsed between two transits of the same star over the meridian, is called a sidereal day. It is divided, as are all other days, into twenty-four hours of sixty minutes each, &c. The time so given is called sidereal time. If the sun were to move directly under the observer, the mode of reckoning. But since the sun has its own slow motion in the ecliptic, in the same direction as the revolution of the earth, the interval between one meridian transit of that body and the next is [Sywopsis] longer than the simple revolution of the earth, for just the same reason that the time which the minute-hand of a watch moves from coincidence with the hour-hand to coincidence again is longer than the hour, or simple revolution of the minute-hand. The difference between the apparent length of the solar day, which means the interval between two meridian transits of the sun, would always be of the same length, and a little longer than the sidereal day. But the sun neither does move uniformly, nor in the equator; and each new day introduces a new irregularity or the absolute length of the solar day, or, as it is called, the real solar day. This is the reason why the time shown by a sundial does not agree with the watch. To remedy this inconvenience, a fictitious sun is supposed to move in the ecliptic, and uniformly, while another fictitious sun moves in the equator, also uniformly. Both the fictitious bodies have the average motion of the real sun, so that the years of the three are the same; and the fictitious sun of the ecliptic is made to coincide with the real sun at the perigee and apogee, or nearest and farthest points from the earth; while the fictitious body in the equator is made to coincide with the fictitious body of the ecliptic at the equinoxes (from which it arises that there is also a coincidence at the solstices). This fictitious sun of the equator, when its clocks are adjusted; the interval between two of its transits, which is always of the same length, is called a mean solar day, which is divided into twenty-four mean solar hours, &c. The difference between time as shown by the real and the fictitious sun in the equator, is called the equation of time.

The determination of the equation of time is a mathematical problem of some complexity: what we have here to notice is that due to the interaction of the two sources of difference, it presents a very irregular series of phenomena in the course of the year. If the sun moved regularly, but in the ecliptic, there would be no equation of time at the equinoxes and solstices; if the sun moved with its elliptic irregularity, but in the equator instead of the ecliptic, there would be no equation of time at the apogee and perigee. Between the two the equation of time vanishes only when the effect of one cause of irregularity is equal and opposite to that of the other; and this takes place four times a year. In this present year (1842) the state of the equation of time is as follows:—January 1, the clock is before the sundial 3° 51′, and continues to gain upon the dial until February 11, when there is 1° 35′ of difference. This then begins to diminish, and continues diminishing until April 15, when the two agree, and there is no equation. The dial then is before the clock until May 14, when the equation is 3° 55′, which diminishes until June 15, when there is again no equation. The clock is now before the dial, and the equation increases till July 26, when the equation is 4° 10′, which diminishes until the 1st of September, when there is no equation, for the third time. The dial is now again before the clock; and by November 2 the equation has become 1° 18′, from which it falls off until December 24, when it is nothing for the fourth and last time. The clock then gets gradually before the dial till the end of the year. The phenomena of the next year will represent a repetition of the same circumstances, with some trivial variations of magnitude. There are several slight disturbing causes to which we have not thought it worth while to advert in a popular explanation: in particular, the slow motion of the earth, and the influence of the tides, &c. But we may mention that the equation of time is always the same, but the signs are reversed in the two hemispheres.

The sidereal day is 23° 56′.049 of a mean solar day, and the mean solar day is 24° 50′.56 of a sidereal day. We have in this article only to do with the mode of obtaining a uniform measure of time, or of intervals of time; this being promised, the subject will be taken up again in the article Year.

TIME BARGAIN. [Strocks.] TIME OF DESCENT. The technical term for the time employed by a material particle in falling down an arc of the ecliptic, or the apparent time, is described by the equation of velocity. When any number of curves are drawn from a given point, and another curve is drawn to cut off from every one of them an arc which is described by a falling particle in one given time, that curve is called tautochronous, or a tautochron. But when a curve is such as the cycloid, namely, that a particle, wherever placed, will fall to the lowest point in the same time, such a curve is also called tautochronous by various writers, and tautochronous by others. Our only object in inserting this article has been to note this confusion of language.

TIME (in Music) is:—

I. The measure of the duration of sound. That which divides a bar into two or three equal parts, and subdivides these.

III. The movement—i.e. the quickness or slowness—of a composition. 1. The degree of sound, or pitch, is shown by the place on the staff of any one of the characters called notes; but its duration is known by the particular note that is, as minims, or crochets, &c. The longest note, in relation to time, used in modern music, is the semibreve, which is considered the measure-note, and its average length is about four beats of a healthy man's pulse. The five other notes are proportionate parts of this. Thus the minim is in duration 1/4 of a semibreve; the crotchet is 1/4, &c.: consequently two minims, or four crotchets, &c., are equal to one semibreve, as exhibited in the annexed table:
2. Time is either duple or triple. The former divides every bar, or measure, into 2, or 4, &c. equal parts; the latter into 3, or 6, &c. Times are marked by the letter C,—also by this letter barred (C) and by figures. The C, whether barred or not, indicates Common Time; that is, duple time, having one semibreve, or its equivalent in notes, in each bar. Figures represent the fractions of a semibreve, the upper figure the numerator, the lower the denominator. Thus: 7/4, the numerator being 7, and the denominator 4, the time is duple; when 3, it is triple; when 6 or 12, it is compound-common; and when 9, it is compound-triple. But in reality, there are only two times,—binary and ternary; or, duple and triple; a fact, which, if long ago have been recognized and acted on, had music, as a system, made those advances which have long been witnessed in the other arts and sciences.

3. The term Time has thither had a third meaning annexed to it in musical language, by its employment in the sense of movement, a practice which has produced some confusion. The Italian word Tempo, signifying the same, is now growing into use,—a manifest improvement, which, it is to be hoped, will not have to encounter those prejudices under which music has so long laboured. [METRONOM.] On the subject of Time (Tempo) Rousseau has well remarked, that a succession of sounds, however skilfully arranged, and however lovely their vegetable shape, is nothing, if it be not measure, the duration, relative and proportional, of sounds, which fixes the true character of the music, and endows it with all its energy. Time (under which term, of course, includes rhythm) is the soul of song. Airs without measure slow make a deathly game, and without spirited, and well cadenced air inspires us with joy, and our feet can hardly be restrained from dancing. Break the measure, confound the relative times of the sounds, and the same air which proportion had rendered so agreeable, at once loses all charm for all the hearers, and are incapable of exciting the slightest degree of pleasure. Time, on the contrary, possesses a force, a power, in itself, and acts independently of a diversity of sounds. The drum must therefore be a proof of this, rough and imperfect as the instrument is, being the measure of all time has said its beats are in rhythm, though the sound is unvaried.

TIMOLEON (Τίμολεων), a Greek general and statesman. He was a native of Corinth, and the son of Timodemus and Timistate. Respecting his youth we know nothing, except that he was no less distinguished by his noble character and his love of freedom than by his illustrious descent. When he had grown up to manhood, his elder brother Timophanes, who had been elected general by the Corinthians, was killed in battle with the Spartans, under the eyes of his native town, by the help of his friends and his mercenaries. Timoleon at first only remonstrated with his brother, but when this was useless, he formed a plot against him, and Timophanes was killed. Soon after this event, which threw all Corinth into a state of violent agitation, some envious men, distrusted of Timoleon as magnumnisus and worthy of a real patron, others cursing and condemning him as a traitor, there arrived at Corinth ambassadors from Syracuse soliciting the aid of the Corinthians against his oppressors. This was a favourable opportunity for the party hostile to Timoleon to get rid of his followers, while at the same time it opened to Timoleon a field of action in Sicily, where he might set according to his principles and deliver the island from its oppressors. Timoleon was accordingly sent to Syracuse with a small band of mercenaries, which he himself had raised, 344 b.c. Syracuse was then divided into three parties: the popular party, which had engaged the service of Timoleon; a Carthaginian party; and the party of Dionysius, the tyrant, who had returned from Italy in b.c. 346. Dionysius had already been driven out of a part of the city by Hicetas, the tyrant of Leontini, who supported the Carthaginian party. On the arrival of Timoleon, Hicetas was killed, and his adherents were driven to Leontini, and Dionysius, who was reduced to surrender himself and his island to Timoleon, was allowed to quit the island in safety, and he withdrew to Corinth, in b.c. 343. [DIONYSIUS.] Syracuse had almost become desolate by the successive revolutions and party struggles. During the winter and the spring following his victory over Dionysius, Timoleon endeavoured, as much as was in his power to restore the prosperity of the city by recalling those who had been exiled, and by vowing colonists from other parts of Sicily and assigning lands to them. After this he continued to carry on petty warfare partly against the Carthaginians and partly against Hicetas. The Carthaginians in the meantime collected a large army, which, after having been conveyed to Sicily by a large fleet. Timoleon could muster no more than 3000 Syracusans and 9000 mercenaries, but in order to strengthen himself he concluded a peace with Hicetas, some of whose troops now sided with Timoleon. He was afterwards rewarded by his superior generalship he succeeded in gaining a brilliant victory over the Carthaginians on the banks of the river Crimissus, and confined them to the part of Sicily between the river Halicius and the western coast, a.c. 338. After this victory and the conclusion of a peace with Carthage he directed his arms against the tyrants in other towns of Sicily, whom he compelled to surrender or withdraw, partly by the terror of his name and partly by force of arms. Hicetas was made prisoner, and condemned to death by the Syracusans, with his wife and family.

After freedom and the ascendency of Syracuse were thus restored in the greater part of Sicily, Timoleon directed his attention to the restoration of the prosperity of the towns and the country. The former, especially Syracuse, were still thinly peopled, and he invited colonists from Corinth and other parts to settle there, and distributed lands among them. He himself, with the consent of the Syracusans, fixed their laws and laws, and to adapt them to the altered sounds and circumstances of the state. Although it would have been easy for him to establish himself as tyrant and to secure in his descendants the kingly power at Syracuse, he fulfilled the duties of the office entrusted to him with a salary which has rarely been equalled. He had no other view but the establishment of popular liberty, for which he prepared and trained the people. Some acts of cruelty and apparent injustice with which he is charged, are so excused in the character of those whom he had to deal with, for the Syracusans at that time were a motley and demoralized people, who could not be managed without Timoleon's assuming at times the very power which it was his wish to destroy. But Syracuse and Sicily felt the benefits he had bestowed on them for many years after his death, and continued to enjoy increasing prosperity.

During the latter part of his life Timoleon was blind and lived in retirement, respected and beloved by the Sicilians as their liberator and benefactor. He died in the year a.c. 337, and was buried in the Agora of Syracuse, where subsequently his grave was surrounded by porches and adorned with a gymnasium called the Timoleontemple. (Plutarch, and C. Nepos, Life of Timoleon; and Diodorus Siculus, lib. xvi.)

Dedication of Syracuse, inscribed as a sample of the Coins of Syracuse.


TIMOMACHUS, a celebrated ancient painter, a native of Byzantium, and said to have been the contemporary of Julius Caesar, who purchased two pictures in encaustic by Timomachus, for 80 Attic talents, about 17,380£; one representing Ajax the son of Telsonom brooding over his fortunes; the other, Medon about to destroy her children. He is said to have been celebrated in the temple of Venus city. These pictures have been more celebrated by the poets; there are several epigrams upon them in the Greek anthology, and they are alluded to by Ovid in the following lines:—

'Duces sedet vulnus fabrica Telsonomius
Inque oscilla aurum sànnum barbara maris habet.' (Pav. xii. 33.)
We learn from Pliny also that the picture of Medea was not finished; its completion was interrupted apparently by the death of the painter, yet it admired, he says, more than any of the finished works of Timonmachus, as was the case likewise with the Iris of Aristides, the Tyndarides of Nicomachus, and a Venus by Apelles, which wended or licentious, or even bold works of the respective masters. This picture is noticed also by Plutarch (De Aud. Poet., 3) in a passage where he speaks of the representation of improper subjects, but which we admire on account of the excellence of the execution.

The misanthrope satirizes Timon by alluding to the contemporary of Cassar ("Julii Cassari aetate"), but Durand, in his History de la Peinture Ancienne, expresses an opinion that the word aetate is an addition of the present editor, and according to the latter the mention of Cassar has much in its favour; the price of these pictures (17,280l.) is enormous, if we suppose it to have been paid to a living painter; but on the contrary it is a case with many parallels if we suppose the money to have been paid for the reputed masterpieces of Timon painting.

The fact of the Medea being unfinished puts it beyond a doubt that the picture was not purchased of the painter himself; and from a passage in Cicero (In Ferr., i. iv. 60) it seems clearly equal that both pictures were purchased of him. He devotes the manner in which they are mentioned with many of the most celebrated productions of the ancient Greek artists, it would appear that they were works of similar renown, and were likewise parodied by the anonymous author of a short passage which is met with under the name of Paussus, Nicias, and other encæastic painters about 300 B.C.

Pliny himself, elsewhere speaking of Timonmachus, mentions him together with the more ancient and most celebrated painters of Greece, with Nicomachus, Apelles, and Aristides, as in the passage above quoted.

Pliny mentions also the following works of Timonmachus: an Orestes; an Iphigenia in Tauris; Lechthyn, a gymnasiast; a 'cognito nobilium,' two philosophers or grammarians, one sitting and the other standing, one of which are mentioned with many of the most celebrated productions of the ancient Greek artists, it would appear that they were works of similar renown, and were likewise parodied by the anonymous author of a short passage which is met with under the name of Paussus, Nicias, and other encaustic painters about 300 B.C.

Timon (Timaro), a Greek poet and philosopher who lived in the reign of Ptolemaeus Philadelphus, about 270 B.C. He was the son of Timarchus, and a native of Phlius in the territory of Sicyon. He studied philosophy under Stilpo, at Megara, and under Pyrro, in Elis. He subsequently spent some time in the countries north of the Ægean, and thence went to Athens, where he passed the ten years of his life, and died in the nineteenth year of his age.

Diogenes Laertius, who has written an account of Timon (ix. c. 12), ascribes to him epic poems, 50 tragedies, satyrical dramas, 30 comedies, sili (σόλλα), and comic plays, all his productions. His other works, which have been of the kind of poetry in which he excelled. They were satires directed against the arrogance and pedantry of the learned. Timon wrote three books of sili (Athenæus, vi. p. 251; vii. p. 279), in which he parodied all the dogmatical philosophers of Greece: he himself was a Skeptic. The metre of these poems was the hexameter, and it appears that sometimes he took whole passages from Homer which he applied as parodies. In the first book Timon spoke in his own person; in the second and third the form of the poems was that of a dialogue, in which the converser with Xenophanes of Colophon, who was supposed to have been the inventor of the sili. (Diogenes Laertius, ix. 111.) We now only possess a few fragments of these poems, which in fact as admirable productions. They are collected in H. Stephanus, Poesae Philosophae, in F. Paul, De Siliis Graecorurn, Berlin, 1821, p. 41, &c.; in Bruneck's Analecta, ii. 67; and in 139. Respecting the other works of this remarkable philosopher, we have only the following notice: "J. F. Langeheinrich, De Timone Sillographe, in 3 parts, Lipsiae, 1780-23."
T I M

may judge from his intimacy with Isocrates, Plato, and other men of talent, and from the manner in which others speak of him, he received a most excellent education; but no important particulars are known respecting his earlier life. The first time that he comes prominently forward in the history of his country, was during the war between Thebes and Sparta. In the year n.c. 375, after the battle of Naxos, the Thebans, who were threatened with an invasion by the Lacedemonians, requested the Athenians to send a fleet to the aid of the Peloponnesians, as they had done at the beginning of the Peloponnesian war. The request was readily complied with, and Timotheus was appointed commander of a fleet of sixty ships, with which he led the Peloponnesians along the western coasts of Greece. In this expedition he first took Corcyra, which he treated with the utmost mildness and without making any use of his right as conqueror. The consequence was, that he had very easy work with Cephallenia and Acrania, and that even Aeleas, king of the Molossians, was induced to join the Athenian alliance. But while Timotheus was thus reviving the power of Athens in that part of Greece, the Lacedemonians sent out a fleet against him, under the command of Nicocles. A battle was fought near the island of Alyzium, in which the Spartans were defeated. Soon after Nicocles offered another battle, but as the fleet of Timotheus had suffered too much to allow him to accept it, Nicocles raised a trophy where his fleet, now reduced to twelve ships, was increased by reinforcements of the allies to seventy ships, against which Nicocles could not venture anything. The original object of the expedition however was now accomplished, as the Spartans had not been able to make their invasion of Lacedaemon, and Nicocles was thus enabled to direct his forces against the Boeotian towns which asserted their independence. Timotheus at the head of his large fleet had no means of maintaining it, for the means he had contained in it, and Athens, which was in no very prosperous condition, had been obliged to bear all the expenses of the fleet, with the exception of what Timotheus himself had furnished from his private purse. Athens therefore concluded a separate peace with Sparta, and sent orders to Timotheus to return home. On his way thither he landed at Zacythus a body of exiles who probably belonged to the democratic party of the place, and who had sought his protection. He provided them with the means of appearing and annulling their enemies, thus liberating the city of Zacythus, which was in alliance with Sparta. The oligarchs sent envoys to Sparta to complain, and Sparta sent envoys to Athens to remonstrate against the conduct of her admiral. But no useful consequence was given to the proceedings, and Athens stood. The Spartan exiles for the purpose of maintaining the peace. The Spartans therefore looked upon the peace as broken, and prepared for new hostilities.

On one of these occurrences Corcyra was hard pressed by the Peloponnesian fleet, and implored the Athenians for protection. Timotheus, who, on his former expedition, had given such great proofs of skill and talent, was again entrusted with the command of sixty ships. But Athens, which was itself in great financial difficulties, had not the means to equip them, and Timotheus in the spring of 373 n.c. sailed to the coasts and islands of the Aegean to request the Athenian allies to provide him with the means of assisting the Corcyrians. He declared that he had received sound information from Corcyra (Demosth. in Timoth. p. 1186). In 373, and in Macedonia he formed friendly relations with king Amyntas. His proceedings however went on very slowly, and apparently without much success, for he was of too gentle a disposition to force the allies to furnish what they could not give conveniently. At last however he had sailed as far as the island of Calalaurae, where his men began to murmur because they were not paid. The state of affairs in Corcyra had grown worse every day. His enemies had agreed upon the sudden collapse of his progress as a favourable opportunity for animing a blow at him. Iphicate and Callistratus came forward to accuse him, whereupon he was recalled, and the command of his fleet given to his accusers and Chabrias. His trial was deferred till later, whereupon he was discharged, not in any account of his innocence, though it was well attested, but on account of the interference of Aeleas, the Molossian, and Jason of Pheneor, who had come to Athens to protect him.

In n.c. 361, after the removal of his rival Iphocrates, Timotheus received the command of the fleet on the coast of Macedonia. He took Potidaea and Tenea from Olynthus, and these conquests were rewarded by his adoption into the patrician order of all the Chalcidian towns. From Thessal he proceeded to the Hellespont, where, with the assistance of Ar- barranes, he again gained possession of several towns. The year following he commenced his operations against Cephalenia, in which however he had no success. He was probably on account of the interference of the Macra- nians, who supported the town, and Timotheus was sent compelled to take flight.

In the year 357 n.c. Timotheus and Iphocrates, who had for some time been engaged in a private marriage between a daughter of the former and a son of the latter, obtained the command of a fleet of 60 s against the rebellious allies of Athens, especially Those of Samos. But the Athenian arms were unsuccessful, and treaty was concluded between the belligerents, and war was ended by a treaty with the Social War. The Athenian generals however Timotheus, Iphocrates, and Menestheus, were charged with having caused the ill-luck of the Athenians, and brought to trial. Timotheus in particular, Timotheus, received bribes from the Chians and Rhodiaces. The Athenians, who were themselves in the greatest danger were so convinced of his innocence, that they declared they were willing to take all the responsibility upon themselves in his behalf, if he was to be reprimanded by the five talents. As he was unable to pay the sum, he submitted to Clacies in Euboea, where he died soon after. The injustice of this sentence was tacitly acknowledged by the Athenians after the death of Timotheus, by the cemn in which his son Conon was allowed to sit beside his father.

Timotheus was no less distinguished as a man than as a general. He was of a very humane and disinterested character. He inherited his property in the shape of a country, which he left to his people only as a means of enriching themselves. When Aret and Jason came to Athens to protect him, they lodged his house, at which time he was so poor, that he was obliged to borrow furniture. He was afterwards of an upright and in a manner worthy of their station. Even his enemies, when they came to know him, could not help being attached and esteem for him.

(Xenophon, Hellen., v. 4, 63. &c.; iv. 2. 11. &c.; in crat.; De Permutat. in p. C. Tamas.; Theb. C. Sec. xv. and xvi.; compare Thirlwall, History of Greece vol. v.)

TIMO THEUS (Τιμόθεος), of Miletus, a Greek lyric and lyric poet. The time when his reputation had reached its height is mentioned by the scholiast on Apollodorus, iv. 6. He was a contemporary of EURIPIDES, and was the last of his class at the court of Macedon, who died n.c. 357, at the advanced age of 97. He was especially noted for the number of the songs of the lyric to eleven, innovation which was considered by his contemporaries as not going beyond the number of seven strings, and as a corruption of music, and a decree was passed at Sparta which is still extant in Boeotia, condemning his mar- vation. (Plutarch, De Mus., p. 1141, ed. Fr. de d. H. xiv. iv. p. 636.) Suidas mentions a great number of poetical compositions of Timotheus, which were at the time very popular in Greece; among them are te- ronomes, thirty-six proenoia, eighteen dithyrambs, twenty-two odes, forty songs, in addition to all these there is the exception of a few fragments which are preserved Athenaeus and the grammarians.

(Vossius, De Poeta Graeco, p. 46; Bod. Ges. der Lyrischen Dichtkunst der Hellenen, vol. ii. p. 3 &c.)

TIMO THEUS (Τιμόθεος), an Athenian poet of the called middle comedy. Suidas mentions the titles of several of his plays, and Athenaeus v. 343 p. serves to show that one of his plays bore the title The Bar- Dog. (Compare A. Meineke, Historia Critica Comicorum, p. 328.)

TIMOTHY, EPISTLES OF ST. PAUL TO. The seven to whom these Epistles are addressed, were a native of Ephesus. Timothy's father was a Greek, and Gentile, but his mother, Eunice, was a Jewess. Both his mother and grandmother Lois were faithful believers (2 Timothen, i. 5), who were probably convert
to the faith by the preaching of Paul and Barnabas on the occasion of their first apostolical journey among the Gentiles. Whether Timothy was himself converted by St. Paul or by the teaching of his mother does not appear, but it is certain that she had taken great pains with her son's education, for from a child, as St. Paul says, 'he had known the Holy Scriptures.' (2 Timoth., iii. 15.) His devotion to his new faith was so ardent, and the progress so rapid, that he was soon known, and gained the esteem and good word of all his Christian acquaintance. Accordingly when St. Paul paid his second visit to Lystra, the believers both of that city and Iconium recommended him so highly to Paul, that he 'would have liked to have taken him along with him.' (Acts, xvi. 5.)

Previously to commencing them however St. Paul circumcised Timothy, 'because of the Jews,' who were numerous and powerful in those parts, and likely to take offence at the preaching and ministerion of an uncircumcised teacher. (Acts, xvi. 1-3.) He was then solemnly admitted and set apart to the office of an evangelist, or preacher of the gospel, by the elders of Lystra and St. Paul himself laying their hands upon him (1 Tim., iv. 14; 2 Tim., i. 6), though he was probably not more than twenty years of age at the time. From this period A.D. 46 mention is frequently made of Timothy as the companion of St. Paul in his journeys, as assisting him in preaching the gospel, and in conveying his instructions to be observed. He was a responsible and divinely called companion with St. Paul and Silas, when they visited the churches of Phrygia and delivered to them the decrees of the council of elders at Jerusalem, by which the Gentiles were enjoined to abstain from 'meat offered to idols, drinking blood, and things strangled.' (Acts, xv. 29.) From Phrygia he proceeded in the same company to Troas, and thence to Macedonia, where he assisted in founding the churches of Philippi, Thessalonica, and Berea, at the last of which cities he and Silas were left behind, when St. Paul was hindered from Macedonia by the persecution of the Jews in that country and retired to Athens. In this city St. Paul was subsequently joined by Timothy (1 Thess., iii. 1), who gave him such an account of the afflicted state of the Thessalonian Christians as induced him to set out on his third missionary journey, and establish churches among them, concerning their faith: a charge both of difficulty and danger. From Athens St. Paul went to Corinth, where he was joined by Timothy and Silvanus, who both assisted him in converting the Corinthians and establishing the Corinthian church, for a period of a year and a half. (2 Cor., i.) When St. Paul left Corinth, Timothy appears to have accompanied him on his return to Asia, where they resided nearly three years, without interruption, except during the visit of St. Paul to Jerusalem. (Acts, xvi. 5.) It is not however apparent that he was accompanied by Timothy. Towards the expiration of their residence at Ephesus, St. Paul despatched Timothy and Erastus together to precede himself on a journey to Macedonia. (Acts, xvi. 5.) It is possible that St. Paul at the same time charged Timothy to visit the church at Corinth. On returning from Corinth to Macedonia, Timothy was joined by St. Paul from Ephesus, and henceforward they were frequently together, till Timothy was appointed by St. Paul to govern the church of Ephesus. In the interval between St. Paul's joining Timothy in Macedonia and the appointment of the latter to the superintendence of the church at Ephesus, Timothy appears either to have remained in or near Ephesus, or to have visited him there. St. Paul, as is well known, was a prisoner at Rome, though under but little restraint, and from Hebrews (xiii. 23) we may conclude that Timothy also suffered imprisonment either at Rome or elsewhere in Italy; and it is the less probable that he could have frequently visited him there. The subsequent history of St. Paul and Timothy is not clearly given either in the Acts of the Apostles or the Epistles of the New Testament; but it is reasonable to suppose that when they were both set at liberty, they resorted to the church of Ephesus for finding novelty and revisiting old. (See Hebrews, xiii. 23; Philippians, i. 1; ii. 19; 2 Tim., i. 3.)

Timothy was eventually left with the charge of the church at Ephesus, and Paul had set his heart on Asia. How long Timothy exercised this office is not known, nor can we determine the time of his death. An ecclesiastical tradition relates that he suffered martyrdom, being killed with stones and clubs (A.D. 97) P. C., No. 1846.

while he was preaching against idolatry in the neighbour-
hood of the temple of Diana at Ephesus. His supposed relics were removed to Constantinople, with great pomp, A.D. 356, in the reign of the emperor Constantine. Shortly after Timothy's appointment to the superintendence of the church at Ephesus, St. Paul wrote to him his first Epistle; the date of which was probably about A.D. 64, after St. Paul's first imprisonment at Rome. Some critics indeed of the text regard it as an Epistle written by the Apostle's own voice before Timothy's appointment to the superintendence of the church at Ephesus. (1 Tim., iii. 1, from which it appears that Timothy was in Ephesus when the Apostle wrote his first letter to him; 2 Tim., i. 8, that he had been left there when Paul was going from Ephesus into Macedonia. A careful examination however of the present text will convince the reader that the contemplated journey into Macedonia, of which the Apostle speaks (1 Tim., iii. 1), is some journey not mentioned in the Acts, and therefore subsequent to St. Paul's release from his first confinement at Rome. But whatever doubt there may be as to the date of the first, there is none about the genuineness of either of the two Epistles to Timothy. They have always been acknowledged to be the undisputed production of the Apostle Paul. The object and design of the First Epistle to Timothy were such as we might have expected from the relation between St. Paul the writer, and Timothy, to whom it was addressed. It was written with the view of guiding and directing the latter in his work as the companion and missionary of the Apostle at Ephesus, to instruct him in the choice and ordination of proper officers, and to warn him against the false teachers (Michaelis thinks they were Essenes) who had 'turned aside from the simplicity and purity of the truth of the gospel, saying things which are hard to be taken in, and which lead to perdition and destruction.' (1 Tim., iv. 1-7.)

From the above it appears that the First Epistle to Timothy was written to instruct him in the character and duties of his office, and to warn him of the danger to which he was exposed. From this the Second Epistle to Timothy, which was written to Timothy almost immediately after the first, should be regarded as an explanation of the First, and an addition to it. It contains much additional information respecting the Church that the Apostle had founded at Ephesus, and respecting the persons and their character who had attained to the rank of bishops and ministers in the churches of Asia Minor. The Second Epistle to Timothy is known by the title The Second Epistle of Paul to Timothy. The Second Epistle of Paul to Timothy. From chap. i., Vol. XXIV. 3 O
VERS. 8, 12, 17, it appears that this Epistle was written by St. Paul while he was a prisoner at Rome; but whether he wrote it during his first imprisonment, recorded in Acts, xvii., or during a second imprisonment, has been much questioned. According to the uniform tradition of the ancient church, it was written during the second confinement. The modern critics, who refer it to the time of the first, are for the most part anti-episcopalian or Romanists, being concerned only the permanency of Timothy's charge at Ephesus; the latter not knowing how to account for the omission of Peter's name in the salutations from Rome. The arguments adduced by Macknight (Preface to 2 Timothy) in support of the opinion of the apostles we have thought conclusive. St. Paul, it is generally agreed, returned to Rome after his first imprisonment, early in A.D. 63; where, after being kept in bonds as an 'evil doer' for more than a year, he is believed to have faced St. Paul and A.D. 66. As therefore the Apostle requests Timothy (iv. 21) to come to him at Rome, before winter, it was probably written in July or August, A.D. 65; and it is generally supposed that Timothy was at Ephesus when St. Paul addressed it to him.

The immediate design of Paul in writing this Epistle was, it would seem, to apprise Timothy of the circumstances that had recently happened to himself at Rome, and to request his immediate presence there. Accordingly we gather from the last chapter of this Epistle, that St. Paul, under confinement as a magician bound to his charge, that when he was brought before the Roman magistrates to make his first answer, 'no man stood by him, but all men forsake him;' that only Luke was with him: that being thus deserted by almost all, he was, as the Apostle says, 'very desolate.' This dearly beloved son in the gospel, before the time of his departure, which he knew 'was at hand.' He therefore requested him to come to Rome immediately, but being uncertain whether he should live to see Timothy again, he gave him in this Epistle a variety of admonitions, charges, and encouragements. This Epistle in fact is an appropriate and affecting sequel to the first, the principal injunctions and warnings of which it repeats, but with additional earnestness and tenderness. St. Paul, as if for the first time (chap. 1.), encourages Timothy to apply himself with all his gifts of grace to his holy work, to hold fast the doctrine which he had received from him, and not to be ashamed either of the testimony of the Lord or of St. Paul's own sufferings.

In chap. ii. St. Paul again cautions Timothy against heresies and 'foolish questions,' and exhorts him to personal holiness. In chap. iii. he gives a description of the 'perilous times which should come,' and which were to be anticipated by every possible exertion in performing the duties of a Christian magistrate. To this Paul exhorted him by a solemn charge before 'God and the Lord Jesus Christ, the judge of the quick and the dead.' He then depicted his own present state, and his presentiment of being soon a martyr: and then, in the immediate presence of Timothy, concluded by sending to him the greetings of some of the brethren of the Church at Rome. Whether Timothy arrived at Rome in time to find St. Paul alive, does not any where appear: the latest authentic information we have concerning him being given in this letter.

The Epistles to Timothy, in conjunction with those to the Thessalonians and Titus, are extremely valuable, as furnishing very strong evidence to the truth of many of the facts recorded in the Acts of the Apostles. They also exhibit coincidences between the Second Epistle to Timothy and the Acts given by Paley, in his 'Horae Paulinae,' pp. 333-336. Their value in another respect is thus described by Macknight, Preface to 1 Timothy—'These Epistles are likewise of great use in the church, as they exhibit to Christian bishops and deacons in every age the most perfect idea of the duties of their functions: teach the manner in which these duties should be performed: describe the qualifications necessary to those offices, and explain the ends for which they were instituted, and are still continued in the church.'

To the Epistle to Timothy, that addressed by St. Paul to Titus, nearly at the same time, is both a companion and an answer. The subject matter in both Epistles is nearly the same; but, and it is important to observe, that in none of these Epistles, addressed to intimate and tried friends, do we perceive any doctrine or precept at all different from what is enforced in the Epistles addressed to and directed to whole churches. The views and hopes and motives of action are the same in both: a proof of the Apostle's sincerity, and an evidence that he did not tinge a single doctrine, one for the learned and the other for the vulgar.


TIMOTHY-GRASS, so called from a person of that name who successfully cultivated it in North America, where it seems to grow more luxuriantly than any other kind of grass, and which is distinguished and its common English name in Meadow Cat's-tail. It has been highly extolled by many agriculturists for its production of hay which it makes, and also for its royal hay, and is consequently much grazed when allowed to stand till it is fit for hay; and in many respects it so readily imbibes moisture, that the harvest a very precarious. This is a principal reason why its cultivation has not been much extended in England. It is said to grow very sweet and early for sheep and cattle, and mixed with other grasses, may be very useful in bringing down land to pasture for a few years.

The soil which suits Timothy-grass best is a good moist and rather stiff loam. On gravel or chalk it does not do well, as it is liable to become infested with other grasses, although very heavy crops of it have been grown; and from its strong stem, when full grown it should always be fed off when young, or cut for hay oats or cattle and horse before the stem has become much green. Timothy-grass, when cut, is readily suitable to the climate of Great Britain appears from its not being grown, but found in the best natural pastures. In rich land which is tired of clover it may form a very good substitute. It may be either sown pure or mixed with other species which have been made with timothy-grass are not sufficiently satisfactory to form a decided opinion of its merits, and it well deserves the attention of experimental agriculturists.

SULTAN, KIAMRAM KOT-ED-DYN GURGAN SABEEH-KIRAN JHANGIR that it is a Timur, the fortunate, the axis of the faith, the pure wolf, the master of the time, the conqueror of the world. 'Terrible is a name which frequently occurs among the Persians,' says the late General d'Ohsson, 'and signifies a favourite or an intimate with the Emperor, which has been made with timothy-grass are not sufficiently satisfactory to form a decided opinion of its merits, and it well deserves the attention of experimental agriculturists.'

TIMUR-KHAN, the son of Bardam-Khan Behadur, or Baha-adur, who was the eldest son, Yasaugli, was the father of George Khan, and he was a direct descendant of the forever-side. He was the successor of Mongol emps, and being of royal blood, he held a high rank and Mongol nobility which was founded by George Khan among the Eastern Turks. (Tartars.) This title was conferred by the title Nusheh, which was added to the name of his father. Yet the power of his family was not lost. Timur was a soldier at the age of twelve years, and he spent his youth in the continual feuds between the Turco-Mongol tribes and the imperial family of Timur. After the death of his father, his uncle Seid-ed-din became chief of the Beris, being the eldest of the family. He was a war having broken out between Husein, of the Khorasan, and Mawwurni, (Mawwurun,) and the Khan of the Tatars, Gareh, in Nild, was opposed by Miran, who was the appointed chief of the tribe of the Beris in a.H. 720 (A.D. 1610.) In 1611, when Timur received a wound in the leg, while fighting in this war, he was called Timur-lenk, or the Lance timur, which had been corrupted by Europeans into Tamerlane, by whose name Timur is as well known in Europe as by his title. Husein rewarded him also with his head. Nevertheless, his greatness attracted to him these favours. Timur intrigued against his protector, and after the death of his wife he openly rebelled against him. A.H. 767 (A.D. 1660.) With a body of only 500 horsos
he surprised and took Nakhalab, a town which was defended by a garrison of 12,000 men, among whom there were 2,000 Turks, and fought by their commander. In May 788 (A.D. 1386) he defeated Husain near his capital, Balkh, and the prince was murdered by some emirs, who, seeing their former master forsaken by fortune, endeavoured to obtain the hand of Timur, who was then victorious in Persia, and turned to the protection of the house of Balkh, which was defended by the adherents of Husain, was taken by storm and destroyed by fire after a siege of three years, A.H. 771 (A.D. 1369), and Timur was proclaimed king of that country in the same year by the Kuraitai, or the central districts, in which Timur had been born and reared, or his capital. Husain-Soham, Khan of Khwarasun (Khiwa), saving imprisoned Timur's ambassadors, was attacked by Timur, who, after five campaigns, at last succeeded in taking the town of Khwarasun, in A.H. 791 (A.D. 1390). Timur occupied it, and the inhabitants, especially artists and scholars, were transplanted to Kesh, which became the second capital of Timur's empire. Previously to this the Khan of the Getes, who was master of the country between the Sibun, or Jaxarte, and the Irish, had likewise been compelled to pay homage to Timur, who thus became master of a part of Siberia and of the whole country which we now call Turkestan, and which was formerly known by the name of Khwarasun, and the northern direction that Timur thought himself strong enough to carry effect the plan of making himself master of all those countries which had once obeyed his ancestor Genghis Khan. His first attack was Khorasan, or the north-eastern part of Persia, and he prepared for it by making himself master of that country. The inhabitants of Khorasan were Khojas-Ali-Murad, whose capital was Sebeswar, Khojaj-Ali-Murad, whose dominions were on the boundaries of Jargatai, paid homage to Timur as soon as he ascended the throne of Khorasan. Timur prepared a vigorous resistance. Timur took Herat by storm, but did not destroy it. He carried off as his trophy the iron gates of this town, which were noted for their beautiful workmanship, and which he ordered to be brought to the country of the Bosphorus, which was famous for its metal work. Of Khojas-Khan surrendered without resistance, and Timur was only checked by several strong fortresses, such as Shaburish, Saburan, Kesh, and especially Kakhish, between Balkh and Kesh, in the mountains of the Hindu-Kush. The inhabitans of Sebeswar having revolted, Timur took the town by storm: two thousand of the inhabitants were slain alive upon the other, till they formed a mass like a tower, and each layer of human beings was fastened to the one below. Timur's generals were all committed to the house of Khojas, or Khorasan, and Timur was thus enabled to attack the country without resistance. Timur had employed twenty years in reflecting on the principles of warfare. He ed his armies with the skill of a countryman who had been trained general, but not with the superiority of genius. The differences between the numerous successors of Genghis Khan enabled Timur to attack them one after another, and each was pressed with the fall of his rivals. He em- ron in his war against Persia. This country was governed by several princes. Shah Sheja, of the dynasty of Moazaafer, who reigned in Fars and southern Irak, or in that part of Persia which was most exposed to the army from the east, submitted to Timur without resistance. Thus Sultan Ahmed, of the house of the Ikhana, the master of Northern Irak and Azeribain, or Western Persia, had alone to sustain the attacks of the Tartars, A.H. 788 (A.D. 1386). Timur entered the dominions of Ahmed by following the coast of the Caspian, and carrying the siege of those provinces of Mazanderan, Rejeb, and Rustemdar, and took the towns of Sultania, Tabriz, and Nakhalawin. He crossed the Araxes at Julfa on a magnificent bridge, which was strongly fortified on both sides, but which is now destroyed. The bridge was left to his hands; Timur, and the prince of Georgia purchased his protection by adopting the Mohammedan faith. The prince of Shirvan sent tribute to the camp of Timur, nine pieces of each thing sent him. Timur had taken with him in his campaign only eight slaves; the nineteenth was himself. On these terms he was allowed to remain in possession of his dominions. Taherten, king of Armenia, submitted to Timur without any resistance; but Kars-Yusuf, prince of Dyar- nekr, and master of the country round Lake Van, prepared to defend himself. A body of Timur's army marched against him, and took the forterasses of Abliat and Dileh by storm; and Timur himself commanded the siege of Van. This famous fortress fell after a siege of twenty days, the garrison was cast from the steep rock on which this town is situated, and the fortifications were razed by the order of Timur. That was the beginning of the downfall of the Carduchian Mountains and to descend into the valley of the Upper Tigris, Timur was obliged, by a revolt of the inhabitants of Ispahan, to march southwards to southern Persia. He took Ispahan by a general assault: he spared the houses and the temples of artists and scholars, but the remainder of the city was destroyed, and the inhabitants were massacred. More than 70,000 heads were laid at the feet of the conqueror, who ordered his soldiers to pile them up on the public places of the town, A.H. 789 (A.D. 1387). Timur surprised the army of Persia. Timur turned his arms towards the north, and over- ran the kingdom of Kiptshak, which was then governed by Toktamish-Khan. This war lasted from A.H. 789 to 799 (A.D. 1387 to 1396). [Tartara Kiptshak.] We shall here only mention the march of Timur in the campaign of A.H. 783 (A.D. 1381). According to Shereef-ed-din, Timur started from Tashkend, on the Jaxarte, on the 13th of February, A.H. 793 (13th of January, 1391). He marched in the north-west, and prepared to enter Kars-chuk; and Sarikan, until he reached Särlik-Uzen, on the river Araxes: thence he proceeded as far as Mount Kuchuk-dagh, and subsequently crossed Mount Ulu-dagh, or the range of the Ailt. He then took a north-western course, and attacked the city of Tobol in Siberia, and thence proceeded westward, crossing the Ural Mountains, and the upper part of the river Ural, or Yalik, where he drew up his army on the banks of the Bielaya, a southern branch of the Wolga. Toktamish, who awaited Timur in the environs of Orenburg, was not a little astonished to find him so far advanced towards the north; but being informed of his having taken that direction, he hastened to the assistance of his ally, and engaged him in a battle which took place on the 15th of Rejeb, A.H. 798 (18th of June, 1391), in which his whole army was slaughtered.

In the following year, A.H. 794; (A.D. 1392). Timur returned to his residence at Samarkand, and he left the war with Kiptshak to his lieutenants; he only appeared in the field in A.H. 797 (A.D. 1315) in order to stop the progress of Toktamish in the Caucasian countries. Meanwhile troubles broke out in northern Persia, which were put down by the submission of Kempt, a prince of the Khojas-Khan, and the city of Fars, which surrendered without resistance, especially in the town of Amul, where the whole tribe of the Fedaiyaa was massacred. Timur himself attacked southern Persia after his first return from Kiptshak. The conquest of that country was attended with the utmost violence, especially in the province of Georgia, where the dynasty of Mosaffar, vassals of Timur, who aimed at independence. After having occupied Loriastan, Timur entered Fars by the mountain-passes east of Shiraz, which were defended by the stronghold of Kaliz-zeft; but this fortress and the capital Shiraz were taken, the princes were put to death or fell in battle, and Timur's son Miran- Shah was invested with the government of Fars and Khuzistan. From Shiraz Timur marched westwards to attack the king of Bagdad, Ahmed Jelbar, of the house of Ikhana, Bagdad surrendered without resistance, and Sultan Ahmed and his family fled towards the Euphrates, accompanied by a small body of cavalry. Timur and forty-five emirs mounted on the swiftest Arabian horses pursued the sultan, and came up with him having had more than 50,000 horsemen. In the engagement which ensued Ahmed was again defeated and compelled to fly, leaving his harem and one of his sons in the hands of the victor. The scholars and artists of Bagdad were transplanted to Samarkand; and Timur remained at Bagdad for two months, learning little to his soldiers that he ordered all the wine which was found in the town to be thrown into the Tigris.

During this time Kar-Kusuf, prince of Dyarnekr, had recovered part of those districts round Shiraz which Timur had taken in his earlier campaign; and several princes in Armenia and Georgia were still independent. Timur resolved to bring them to submission, and after having succeeded in this, to attack the kingdom of Kiptshak on its boundaries in the Caucasus. Starting from Bagdad in A.H. 797 (A.D. 1394), he marched to the Upper Tigris...
Tigris by Tekrit, Roha or Edessa, Ho-su, and Keif, all situated in Mesopotamia. He laid siege to Mardin, a strong place in the mountain-plateau south-east of Diyarbekir, but not being able to take it, he proceeded himself with the promise of a annual tribute which Sultan Isa, the master of Mardin, engaged to pay, and he marched to Diyarbekir. This town was taken and plundered. From Diyarbekir Timur marched to Akhlat, north of Lake Van, crossing the Euphrates in the process. He then overran the provinces of Cilicia and the Cilician Gates, and so far as Moscovia, whereupon he left the command of these countries to his lieutenants, and returned to Samarkand, in order to prepare for a campaign against India.

After the death of Firus-Shah, the master of India between the Indus and the Ganges, several pretenders made claims to the vacant throne. At last Mahmud succeeded in making himself master of Delhi, and in establishing his authority all over the empire of Firus-Shah. Under the pretext of the rivas of Mahmud, Timur declared war against India; and such was the renown of his name, that ambassadors from all the countries of the East arrived at Samarkand and congratulated him on his new conquests before he had obtained any triumph. Timur, in his usual style, a.d. 1396. He proceeded on his way through the passes in the Ghur Mountains, or the western part of the Hindu-Kush; and on the 8th of Moharram, a.d. 801 (19th of September, 1396), he crossed the Indus at Attok, where Alexander the Great and his entire host was defeated by the Genghis Khan had been compelled to give up his plan of advancing farther. Timur traversed the Punjab in a direction from north-west to south-east, crossing the rivers Behut, Chunab, Ravee, the Euphrates, and the Tigris, and then advanced northwards as far as Moscow, where he left the command of these countries to his lieutenants, and returned to Samarkand, in order to prepare for a campaign against India.

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Persia and Jazgat's descendants reigned for a century; and for three centuries they ruled over Northern India under Moguls.

Timur has been compared with Alexander, but he is far below him. It is true, that except in India, Alexander found only effeminate nations on his way, while Timur fought with the most warlike nations of the world; but the enemies of Alexander were Greeks, Egyptians, Persians, and Turks, which were governed by one absolute master, while the warlike nations which were subdued by Timur were divided into a multitude of tribes and governed by numerous princes, each of whom was jealous of his neighbour. Timur overran the Persian, Turkish and Ottoman, and the Tartars of Kipshah, but he was not able to subdue them. Both Alexander and Timur protected the arts and sciences, but Timur could only transplant them; he forced his power upon people, while Alexander forced them to acknowledge his power because he could appreciate their talents. Timur's cruelty was the consequence of his savage and barbarous temper; Alexander only forgot the laws of humanity when he was overpowered by wine or by passion. Timur was a man of extraordinary talents, who accomplished great things after long experience and severe struggles: Alexander, a true genius, came, saw, and vanished. The greatness of Timur inspires awe, and we shrink from it with terror; the greatness of Alexander attracts us because it is adorned with the amiable qualities of his character.

The life of Timur is the subject of many valuable works. Sheref-ed-din'Ali wrote the history of Timur in Persian, which has been translated into French by Penzel la Croix, under the title 'Histoire de Timur-Bec, connu sous le nom du Grand Tamerlan,' &c., Paris, 1722. This is the best work concerning Timur, although the author often flatters.

Abasiah, a Syrian, on the contrary, depreciates the character of the Timurides.

The same book was translated into modern German by Penzel, München, 1813. Schidberger, a German soldier, was made prisoner by the Turks in the battle of Nicopoll (1395), when he was only sixteen years old, and Angora he was taken prisoner by the Tartars, and became a kind of secretary to Shahrokh and Miran-Shah, the sons of Timur. He finally returned to Germany in 1427, after a captivity of thirty years, and then wrote the history of his adventures.

Clavijo gives a correct conception of Timur's conquests in the 'Decline and Fall,' chap. liv. Another most valuable work is Clavijo, 'Historia del gran Tamerlan, e Itinerario,' &c, Clavijo, ambassador of king Henry III. of Castile at the court of Timur, was present at the battle of Angora. (Descriptoins, Historie des Huns, vol. ii.) Timur may be considered as the author of the 'Tufuket, or the Code of Laws.' This work was originally written in the East-European language, and was translated into Persian. The Persian version, with an English translation and a most valuable index, was published by Major Davy and Professor White, Oxford, 1783, 4to.; and Langley has translated the Persian version into French, under the title, 'Instituts Politiques et Militaires de Tamerlan,' Paris, 1787. This work is of great importance for the history of Timur; we see that this Tartarian conqueror was provided with maps and works concerning geography, which were composed by his order.

TIN. This metal is one of those which were earliest known, though it occurs in comparatively few countries: the acquaintance of the ancients with this metal, though it does not occur in the native state, is accounted for by the circumstances that the ore is found frequently near the surface, and is easily reduced by charcoal and a moderate degree of heat to the state of metal.

According to Berzelius, tin is found in England, Saxony, Bohemia, Hungary, the isle of Banca, the peninsula of Malacca, in Chili, and Mexico: Malacca furnishes the purest tin, and Cornwall the largest quantity.

Tin occurs in two states of combination, the peroxide and double sulphurphate of tin and copper: this last is rather a rare substance, and it is from the former that the metal is almost entirely obtained.

The peroxide of tin is found in Cornwalt in two forms:—1. In veins in primitive countries, where it is intimately mixed with several other metals, as arsenic, copper, zinc, and tungsten: this is common stannite. 2. In loose rounded masses, grains, or sand in alluvial soil, in which state it is called stream-tin. The former, when reduced to the metallic state, yields block-tin; while the latter yields grain-tin, which is the purer of the two.

The oxide of Tin, Hydrostannic or Stannic, is found in attached and imbedded crystals, and massive. Primary form a square prism, which is commonly terminated by four-sided pyramids. Cleavage parallel to the lateral planes and both diagonals. Fracture uneven or imperfectly conchoidal. Hardness 6 to 7; gives sparks with steel, and is brittle. Colour white, yellow of various shades, red, brown, and black. Streak paler. Lustre adamantine, vitreous. Transparent, translucent, opaque. Specific gravity 6/6. In soluble in acids. Before the blow-pipe, in powder on charcoal, it is reduced to the metallic state. Fine crystals of this substance occur, more especially in Cornwall and Saxony.

Analysis of the oxide of tin of Cornwall by Klaproth:—

<table>
<thead>
<tr>
<th>Substance</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tin</td>
<td>77/5</td>
</tr>
<tr>
<td>Oxygen</td>
<td>21/5</td>
</tr>
<tr>
<td>Iron</td>
<td>0/25</td>
</tr>
<tr>
<td>Silica</td>
<td>0/75</td>
</tr>
</tbody>
</table>

The Massive Varieties of oxide of tin are called stannin. What is termed wood-tin is found in reniform and botryoidal masses, or in wedge-shaped pieces, which have arisen from their partial destruction; the surfaces are generally water-worn. Wood-tin exhibits various shades of brown, which sometimes appear in concentric bands, giving it a ligneous appearance, whence its name.

Stream-tin has evidently been derived from the decomposition of wood-tin. In the depths of caverns, where portions of stony matter having been carried away by the water, which has rounded the fragments of the ore.

At Finbo in Sweden oxide of tin has been met with containing nearly 2/1 per cent. of oxide of tin; the surfaces are generally water-worn.

The Parts.—Stannic or Stannic oxide of Tin and Copper, is a rare substance, having been found only in Cornwall at Hue Rock, in the parish of St. Agnes.

It occurs crystallized and massive. Primary form of the crystal a cube. Cleavage parallel to the faces of the primary form. Fracture uneven, with a metallic lustre. Hardness: readily scratched and reduced to powder; brittle, Colour steel-grey, mixed with yellow. Specific gravity 4-35.

Massive Variety.—Fracture granular and uneven, with a metallic lustre. Hardness 4. Brittle. Opaque. Specific gravity 4-35 to 4-76.

Analysis by Klaproth:—

<table>
<thead>
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<th>Substance</th>
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<tr>
<td>Tin</td>
<td>34</td>
</tr>
<tr>
<td>Copper</td>
<td>36</td>
</tr>
<tr>
<td>Iron</td>
<td>2</td>
</tr>
<tr>
<td>Sulphur</td>
<td>25</td>
</tr>
</tbody>
</table>

Having now described the ores, we proceed to state the Properties of Tin.—This metal is of a silver-white colour, very soft, and so malleable that it may be reduced to leaves 1/1000 th of an inch in thickness. It is not tinfoil: it suffers but little change by exposure to the air, and that which does occur arises rather from impure sulphurous vapours than from oxidation; for it is not oxidized by the common action of air and moisture. Its tenacity is but slight, so that a wire 1-15th of an inch in diameter is capable of supporting only about 31 pounds: a bar a quarter of an inch in diameter was broken by 296 pounds weight. Tin is inelastic, but very flexible, and when bent it produces a peculiar crackling noise. When rubbed it imparts to the fingers a peculiar smell, which remains for a considerable time. Its specific gravity is about 7-29; at 442 Fahr. it fuses; and if exposed at the same time to the air, its surface is tarnished by oxidation, and eventually a grey powder is formed. When
heated to whiteness it takes fire, and burns with a white flame, and is converted into peroxide of tin. If slowly cooled after fusion, it exhibits a crystalline appearance on solidifying.

Oxygen and Tin do not readily combine at common temperatures: they unite in three proportions, forming the protoxide, sometimes called stannous acid, the sesquioxide, and the per- or tin-oxide, frequently termed stannic acid. Protoxide of tin cannot be procured perfectly pure by direct action: the best method of preparing it is to procure a solution of protochloride of tin, evaporate it carefully to dryness, and then triturate it in a mortar with excess of crystallized carbonate of soda, which decomposes the chloride, and leaves the protoxide of tin.

When this has been washed, and dried carefully on the sand-heat, it is of a fine bluish-black colour, is very soluble in hydrochloric acid, and when heated in the air it takes fire, burns, and is converted into peroxide: the density of protoxide of tin is 6·666: it is soluble in solution of potash and soda, but not in ammonia, nor do the alkaline carbonates dissolve it. It is composed of—

One equivalent of oxygen
8

Equivalent 80

The alkaline solutions of this oxide gradually deposit metallic tin, and peroxide remains in solution. Its salts very readily absorb oxygen from the air, and form compounds which readily yield oxygen; and it is on this account that it converts the sesquioxide of iron into protoxide, and gives silver, mercury, and platinum in their metallic state. With gold a purple compound is formed, known by the name of the purple powder of Cassius. The hydrate of this oxide of tin is white.

Sesquioxide of Tin is formed by mixing fresh precipitated and moist hydrate of peroxide of tin with a solution of protochloride of tin, as free as possible from hydrochloric acid: by the mutual action of these substances a limy grey matter is thrown down, which is generally slightly yellow, from the presence of a little peroxide of iron. It is composed of—

One equivalent and a half of oxygen 12
One equivalent of tin 56

Equivalent 70

It is soluble in hydrochloric acid, and also in ammonia, which last property distinguishes it from the peroxide; and it is distinguished from the peroxide by giving a purple precipitate with the salts of gold.

Peroxide or Bin-oxide of Tin, or Binamic Acid.—This is readily prepared by the action of strong nitric acid slightly diluted upon tin; violent action occurs, and the binoxide formed remains in the state of hydrate: after washing and drying and exposure to a red heat, the binoxide remains pure, is a pale straw-yellow colour, and sublimes at a temperature of 666°. When decomposed by an alkali, also yields binoxide of tin: when it has been rendered red-hot it is quite insoluble in acids, and acts as an acid by forming soluble compounds with the alkalis, which are called stannasates: the moistened hydrate acts as an acid also in reddening litmus-paper. When melted with glass it forms a white enamel.

It is composed of—

Two equivalents of oxygen 16
One equivalent of tin 56

Equivalent 74

Chlorine and Tin combine to form the protochloride and the perchloride. The protochloride is prepared by dissolving the metal in hot hydrochloric acid till the evolution of hydrogen gas ceases: the solution is colourless, and deposits crystals, which sometimes are acicular, and at other times of considerable size. They consist of—

One equivalent of chlorine 36
One equivalent of tin 68
Three equivalents of water 27

Equivalent 121

When heated to about 212°, the whole of the water is nearly expelled; at a higher temperature hydrochloric acid is evolved, and oxichloride of tin remains. It is soluble in a small quantity of water, but decomposed by a large quantity, oxichloride of tin being precipitated.

The protochloride of tin is used as a reagent in emuls-priming, and in chemical investigations as a re-chlorid agent, or as the mode already described.

Protochloride of tin may also be obtained by dissolving a mixture of equal weights of granulated tin and bichloride of mercury, or of protochloride of mercury, or by fusing hydrochloric acid gas over tin heated in a glass tube; in all these cases it is prepared free from oxide: it is a grey solid, of a resinous lustre, which fissures below redness and sublimes at a high temperature.

Bichloride of Tin may be prepared in several modes: first, by heating the protochloride in chlorine gas; second, by dissolving the hydrated peroxide in hydrochloric acid; third, by putting tin into the mixture of hydrochloric and nitric acid, called aqua regia, which yields nascent chlorine; fourth, when a mixture of 1 part of tin with 4 parts of anhydrous hydrochloric acid is heated, a colourless limpid liquid is obtained, which fumes strongly in moist air; this is the bichloride of tin, formerly known by the name of the fuming liquor of Libanus; it boils at 666°, is rendered solid by the addition of one third of its weight of water, and dissolves in a larger quantity; by the action of alkalis it is decomposed, hydrated peroxide of tin being precipitated.

It consists of—

Two equivalents of chlorine 72
One equivalent of tin 56

Equivalent 128

Sulphur and Tin combine in three proportions: the proto-sulphide is prepared by adding to melted tin an equal weight of sulphur, and stirring the mixture till combustion is effected; the product is to be powdered when cold, mixed with an equal weight of sulphur, and throws a small portion into a hot crucible and eventually bedded to redness. Its properties are, that it is of a black-brown colour, has a metallic lustre, fuses at a red heat, and when cooled has a lamellated texture. When hydrochloric acid is passed into a solution of protochloride of tin, a similar compound is obtained; hydrochloric acid destroys protochloride of tin with the evolution of hydrochloric acid gas, a solution of the protochloride of tin being formed.

It is composed of—

One equivalent of sulphur 16
One equivalent of tin 56

Equivalent 74

Sesquioxide of Tin.—To prepare this, finely powdered proto-sulphuret of tin is to be mixed with a third of the weight of sulphur, and the mixture is to be heated to a modern red heat, always stirring the mixture. It has a deep greyish-yellow colour, and when strongly heated is converted to the state of proto-sulphide when heated in hydrochloric acid, hydrocyanic gas being given out.

It is constituted of—

One and a half equivalent of sulphuret 24
One equivalent of tin 56

Equivalent 88

Bisulphuret of Tin may be prepared in different modes when hydrocyanic acid or hydrocyanic acid gas is added to a solution of bichloride of tin, a bulky precipitate of a dirty yellow colour is obtained: this is hydrated bisulphuret of tin: in the dry way it is procured by heating bichloride of tin with eighty parts of tin amalgam, with sixty parts of mercury, rubbed up with seven parts of hydrocyanic acid gas, and sixty parts of hydrochloric acid: the mercury facilitates the combination of the tin and sulphur, and the ammoniacal salt, by its evaporation, appears to prevent the temperature becoming too great, and to decompose the bichloride of tin formed. This substance, formerly known to the chemists by the name of Aurum muscarum, or Zima gold, is in crystalline scales, and sometimes in six-side plates, of a dark bluish colour and metallic lustre. It is red or colourless in any acid, but nascent chlorine causes it to be changed to the size called aqua regia, dissolves it; it is soluble in solution of potash and soda, forming what has been two called sulphur naphtha.
Phosphuret of Tin is readily formed by adding phosphorus to the melted metal; it is of a silvery-white colour, and soft enough to be cut with the knife. After fusion it crystallizes: when thrown upon a red-hot coal, the phosphorus burns. This compound does not appear to have been accurately analyzed; but when phosphorized hydrogen is made to act upon a solution of protochloride of tin, a phosphine is formed, which is readily oxidized by the action of the air.

It consists of—

Two equivalents of sulphur
One equivalent of tin

Equivalent

Phosphuret of Tin is readily added to solutions of the peroxide of tin; but a coarse powder, the one infused of galls occasions any precipitate. When chloride of gold is poured into solutions of peroxide of tin, a purple-coloured precipitate falls. A solution of potash throws down a white precipitate, which dissolves in excess of the alkali. In the solution be boiled, a black powder falls, which is metallic tin; while a compound of peroxide of tin and potash remains in solution. Ammonia throws down a white precipitate, not soluble in excess of the alkali.

Alloys of Tin.

Most of the malleable metals are rendered brittle by alloying with tin; it combines readily with potassium and sodium, forming brilliant white alloys, which are less fusible than tin; but the potassium alloy burns readily while it contains more than one-fifth of potassium. With arsenic it forms a metallic mass which is whiter, harder, and more sonorous than pure tin. With antimony tin forms a white, hard, and sonorous alloy. Bismuth forms with tin an alloy which is more fusible than either of the metals separately, a mixture of equal weights melting at 212°; this compound is hard and brittle. Copper and tin form alloys which are well known and highly useful; they are bright red and mercury readily amalgamates, and the compound is used for silvering mirrors. With iron tin forms white compounds which are more or less fusible according to the proportion of iron they contain; tinplate is of all the alloys of tin the most used, the melting point of which is about 700°. Tin is the most extensive applications of this very valuable metal.

Tin, Manufacture of. Under this head may be noticed, first, the processes required to bring tin into marketable state, embracing the smelting and refining of the metal; secondly, the manufacture of tin-ware, or of articles of tin-plate; and, thirdly, a few of the manufactures of compound metals in which tin forms the principal ingredient. The tin ores are procured from the coasts of Cornwall, the richest source of iron, the inner surfaces of vessels of iron or copper, &c., with a thin coat of tin, forms the subject of a separate article.

Smelting and refining of Tin. Separation of Black and Grain Tin. The processes by which tin-ores are mechanically separated from the grosser impurities which are usually found with them, and broken into fragments convenient for the subsequent operations, are briefly noticed in the article Mining, vol. xxv., pp. 244 and 245. After being thus reduced, the ore is roasted or calcined in a reverberatory furnace, until it ceases to exhale arsenical vapours, by which, together with some subsequent processes, it is further cleansed from the admixture of foreign matters. On account of all the processes connected with the preparation and smelting of tin-ore, as practised about sixty years since, is given in the 'Mineralogia Cornubienesis' of Pryce, of Redruth; but, although most of the processes are still performed with little alteration, we have depended more for the following account of them upon an extensive article on 'Tin,' in Dr. Ure's recently published Dictionary of Arts, Manufactures, and Mines, in which the previous operations of mining are also minutely described. The ores of tin in Cornwall are of the copper and arsenic kinds, which are always reduced, or smelted, within those counties, their exportation being prohibited; but this arrangement is stated not to be injurious to private interests, because the vessels which bring the fuel from Wales for the smelting furnaces return to Swansea and Neath laden with copper ores. The smelting-work does not generally belong to the proprietors of the mines, but to other persons who purchase the ore from them, their value being determined by the kind of assay. After the ore is reduced, or smelted, for form quality, are taken to the smelting-works; a small sample is taken from each, and these samples, after being blended together, are mixed with about four per cent. of ground coal, placed in an open earth oven, and heated in an air, until the ore is reduced. As the furnace is made very hot before the crucible is introduced, the assay is finished in about a quarter of an hour; after which the melted metal is poured into a mould, and the drossy substances which remain in the crucible are pounded.
in a mortar, in order to separate, and to add to the ingot, any minute granules of tin remaining among them. Dr. Ure observes that a mixture of these two would be obtained by fusing the ore, mixed with five per cent. of ground glass of borax, in a crucible lined with hard-rammed charcoal. A gentle heat should be applied to the crucible during the first hour, a stronger heat during the second hour, and, finally, an intense heat for a quarter of an hour. This process brings out from four to five per cent. more tin than the other; but it is stated that it has the inconveniences of reducing the iron, if any be present, which may be readily ascertained by subsequent solution in nitric acid. If the silicate of iron, which would be left, would be tedious for ordinary adoption, as the smelter may have occasion to try several samples in one day; and that first described, while imperfect in a chemical point of view, affords a similar result to that resold by the smelter on a large scale.

The smelting of tin-ores is effected by two different methods, which may be briefly described by stating that in the first and most common, the ore, previously mixed with charcoal, is exposed to heat in the hearth of a reverberatory furnace, in which pit-coal is used as fuel; while in the second, which is applied merely to "stream tin" (the tin procured from stream-works), and which is followed in order to obtain the finest quality, the ore is fused in a basin, formed like a blowing-house, in which wood-charcoal is used for fuel.

In the former process the prepared ore, which is called *wilt*, is mixed with from-one-fifth to one-eighth of its weight of powdered anthracite, or culm, to which a little slaked lime is added. The furnace is then charged as described above.

These substances are carefully blended together, and a little water is added to the mixture to facilitate the operation of charging the furnace, and to prevent the charge from being blown away by the draught of the smelting process. From twelve to sixteen cwt. of the above mixture forms an ordinary charge; but in the smelting-furnaces at St. Austell, or Austell, in Cornwall, of which representations are given by Dr. Ure, each charge amounts to from fifteen to twenty tons. The charge is spread upon the concave hearth of the furnace, and then the aperture by which it is inserted is closed and luted, and the furnace is gradually heated, and kept hot for six or eight hours, by which time the reduction of the ore is completed.

The final application of the required temperature is necessary to prevent the tin oxide from uniting with the quartz of the gangue, or refuse portion of the ore, and forming a kind of enamel. When the fusion or reduction is considered to be finished, one aperture of the furnace is opened, and the melted mass is stirred up to remove the separation of the tin from the scorie, which are then drawn out by means of an iron rake. These scorie consist principally of masses of refuse matter, and some of very tin containing, which are immediately thrown away; but among them are pieces which yet retain a considerable quantity of tin, and which are separated and reserved for further processes. So soon as these refuse matters are removed, a channel is opened by which the melted tin flows from the hearth into a large vessel called the basin of reception, where it is allowed to rest for some time, in order that the impurities yet remaining with the metal may separate, by their different specific gravities. When it has settled, the tin is ladled into moulds, so as to form into large blocks or ingots.

The ingots produced by the above process frequently contain portions of iron, copper, arsenic, and tungsten, together with small quantities of sulphur, tellurium, and antimony, which escaped decomposition, undecomposed oxide of tin, and earthy matters which have not passed off with the scorie. To remove these tin is subsequently exposed to the process of refining, which commences by placing the crucible on the hearth of the reverberatory furnace, similar to that used for reducing the ore, and applying a moderate heat, which causes the tin to melt, and to flow into a basin provided for it, leaving upon the hearth a residue which consists of a very ferruginous slag. From blocks are then placed into the furnace, but removing the unsoftened remains of the former, until about six tons of tin have flowed into the basin. This part of the process is termed a *tiation*, and is followed by the actual refining, which is usually effected by plunging billets of green wood into the melted tin in the basin, by means of an apparatus erected by it. The basin is filled with a mixture of coke, fuel, and is a kind of ebullition produced in the tin, which causes the lighter impurities to rise to the surface in a frothy form, and the heavier to the bottom. The froth or scum, which consists chief of the oxides of tin and foreign metals, is skimmed off and returned into the furnace; and when the tin is sufficiently boiled, the green wood is lifted out, and the coal is allowed to settle, in which the densest part rests on the top, that with a trifling admixture of foreign metal, is given in two or more metal vessels, and then the tin is allowed to settle, and is poured into the crucible or vessels formed from the lowest part of the basin, and is used for use in the preparation of the refined process. The operation as above described requires five or six hours; of which the first is occupied in blowing the furnace, the three following in stirring the tin with the bill of wood, and the remaining time in subduction. A similar effect is sometimes produced by an operation called *tinning*, in which, instead of the ebullition produced by the green wood, the mass of melted tin is agitated by water, ore, or some other means of forcing a current. The tin is then allowed to settle, and it falls into the basin from a considerable height.

After continuing this agitation for some time, the surface is skimmed carefully; and if the upper part of the basin is yet too impure for the market, the refining is repeated, the distillate being first thrown out, and then allowed to stand until the impurities separate spontaneously. After refining, the tin is cast into blocks of about the cwt. each. The moulds used for this purpose are generally made of a *block tin*. From a very remote period, almost to the present time, a duty was paid upon all tin raised in Cornwall to officers appointed by the duchy, who required a block of tin, before being sold to market, to be taken to the duchy offices, and there coined; the value of which was the expense of sending it to one of the places appointed for coining, and the inconvenience of waiting for the periodical coinages, which were usually three years apart. These duties were abolished by 1 & 2 Vict., c. 20, which repeals a perpetual duty. The cornwall equal to the average produce of the tin during ten years previous to its coming into operation. It has been stated that the richer portion of the ore is left or rejected by the smelting of tin reserved for other purposes. Such as contain small quantities of tin. Scarcely any or ore taken to a stamping-mill, and broken washed in a similar manner to the ore, while those which contain much tin are re-smelted without any previous preparation. From these scorie, which are called *wilt*, an inferior kind of tin is produced by a second smelting.

The inferiority of this product may be readily imagined: observes Dr. Ure, since the metal which forms the scoriace is what, being less fusible than the pure metal, is always partitioned out of the metallic bath, or basin of reception. The dross or residuum of the refining furnace is increased fire after the removal of the refined tin, and is then put out into a separate basin, in which it is allowed to stand. This residue is then carried into another crucible, which needs a second refining, and the inferior portion of the mixture becomes deposited on the bottom and sides of the vessel in the form of a brittle white alloy, with a crys Radiant tin contains large proportions of foreign metals that no use is made of.

The average quality of the tin-ore, as prepared for smelting-furnaces, is such that 20 parts of it yield from 1 to 13 parts of metallic tin, or from 624 to 65 per cent and the quantity of coal required for producing one ton

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*Dr. Ure: hut Fryer, in his "Miscellaneous Observations," last the 12.3.3. s. 12.7. 12.7. Tin, or tellurium, and it is a form (p. 398). The term scoriace, which remains in the scorie or slag after it is first smelted, which must be re-smelted and coatable, He applies the same term to copper in similar states.
T I N

TIN 473

TIN

 Tin is about a ton and three-quarters. Respecting the time when this economical fuel was substituted for wood-charcoal in the smelting of tin-ores, authorities are at variance. Pryce, in his 'Mineralogia Cornubicensia,' p. 282, says that 'Necessity at last suggested the introduction of wood- charcoal for the smelting of tin, and sometimes be.

Sir Bevil Granville, of Stow, in this county (Cornwall), temp. Car. I., who made several experiments, though without success; and he adds that the 'efficient smelting of the ores of tin did not take place till the second year of Queen Anne,' when Mr. Liddell, with Mr. Moult, a noted chemist, obtained his majesty's patent for smelting block tin with fossil coal in iron furnaces. 'The invention of reverberatory furnaces for the production of tin were employed alone in the district of Cornwall.' As a result of this discovery; the form of which, he states, writing about 1778, 'has admitted little improvement to the present time.' Holland, after observing that the commencement of this important substitution is generally supposed to have been about 1803, states that the question as to the discovery of the fitness of pit-coal for the purpose lies between Pryce's account, as above cited, and that of Becher whose name he incorrectly gives Beecher, an ingenious chemist, who, in consequence of persecutions in his own country, visited England, and in the first year of Charles the Third introduced several improvements in the art of mining; and he quotes a passage, but without referring to his authority, in which Becher claims for himself the credit of the introduction of coal for this purpose. 'Though between the precise time or manner of this improvement, its importance is indubitable; and such is the effect of the superior economy of this and other metallurgical operations as performed in England, that experiment has shown the employment of blast and simple, consisting of bench pits and shears, mallets, as this island for the purpose of smelting, and sending the tin back to the East at a lower price than it can be produced for on the spot.

The smelting or reduction of tin by the blast-furnace with wood-charcoal, is practised on a limited scale for the production of tin of the greatest possible purity. The finest ores supplied by stream-hawks, and the finer tin sands, are selected for this operation, and as these are free from many of the impurities found in other ores, they do not require calculation. The works in which blast-furnaces are employed are commonly called blooming-houses. The furnaces used are about six feet high, from the concave hearth to the throat, or commencement of the long narrow neck, which, as it is impossible by this means to make the bend as even, or at true an angle as is desirable, Mr. J. Basset, of Birmingham, contrived a simple and effective apparatus for the purpose, for which he was rewarded by the Society of Arts in 1831. An end view of this apparatus is given in the subjoined cut, in which a represents a metal block screwed down firmly to a bench, and having a longitudinal cylindrical cavity, within which is laid a long iron cylinder, the end of which is distinguished in the cut by a tin. The diameter of the cylinder is such that it will turn freely upon its axis within the cavity in which it lies, and which has a slit or opening about half an inch wide along the top of the cylinder at b. A squared axis projects from each end of the cylinder to receive a handle c, which, when the instrument is at rest, lies in an horizontal position, and is supported by the block d. These handles are not fixed to the square axes of the cylinder, but are capable of being

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taken off and put on again in any position of the cynder, which should be equal to that of the longest length or bend. Longitudinal cuts, wide enough to receive the edge of a tin-plate, are made in the cylinder from the circumference towards the centre to any required depth or at any required angle, and A, B, and C, in order to make a right-angled lap, as shown in the marginal figure G, the cylinder is turned into the position shown in the figure, with one of the radial cuts under the longitudinal opening in the block a. The handles are put on, and the edge of the lap is inserted into the semi-cylindrical groove in the cylinder. The handles are then moved in the direction indicated by the arrow and dotted lines, and the plate is forced to assume the position of the dotted lines G, receiving at the same time the required lap B, and returning towards the original position, the plate may be easily removed. In addition, to make the plate to be bent so as to form a hollow cylinder or tube, the motion of the handles is continued until the cylinder is turned completely round, by which means the plate will be wrapped or rolled round it. The cavity in the block a is made large enough to receive the cylinder with this addition to its thickness; and if this operation be attempted, one side or cheek of the cylinder is made larger than the rest, a pivot, so that the purpose of lifting out the cylinder. The pipe is subsequently removed from the cylinder by detaching the handles and sliding it off longitudinally. Appended to the description of this apparatus, in the Society's 'Transactions,' is a description of a method of bending metal, or brass, by filling them with hard solder, and passing them through two thick rings of the same substance, one of which is fixed in a vice or work-bench, while the other is attached to the ends of such lengths of pipe as are to be bent to sufficient leverage for bending the pipe in that portion which intervenes between the rings. As the solder is softer than the material of the pipe, the rings will give way to any dangerous pressure sooner than the pipe itself. When this ring has been passed over the curve of the pipe, the solder is melted from the inside of the pipe. It is observed that in performing this operation upon brass pipes, they should be previously tinned on the inner surface, in order to secure a perfect union between the tube and the core of solder.

After a tin vessel has been rounded upon a block or mandril, by striking it with a wooden mallet, and the seams finished as above described, all its exterior edges are strengthened by bending a thick iron band into a perfect ring, applying it to what would otherwise be the raw edges of the metal, and dexterously folding them over it with a hammer. By this means the appearance of the articles is improved, and their durability and strength are greatly increased. A superior kind of tin-ware, commonly known as block-tin, is carefully finished by beating or polishing a polished steel hammer upon a metal plate, by which means the surface, which otherwise appears somewhat wavy, is made very smooth and silvery, especially if it has been polished with dry whiting. But it is principally in the production of block-tin wares that swaging is resorted to as a ready means of producing grooved or ridged borders or other embossed ornaments. This process consists in swaging the metal between two steel dies or swages, the faces of which bear the desired pattern, and are made counterparts to each other. The mouldings round the edges of dishes and other similar articles are produced in this way; the swages embossing the required lengths, and the metal being being gradually turned round until every part of its circumference has been submitted to its action. It was formerly usual to make such mouldings separately for large articles, and to attach them with solder; and Holland states that the practice of swaging was introduced in England by Thomas Holborn, who executed very bold and handsome mouldings by placing the outside of the article upon a concave bed of lead, having a hollow line or groove sunk into it, into which the rim of the cover or vessel was forced by the application of a huge hammer on the inner side, until the required degree of projection was obtained. The border was then completed by the application of swages, as before described. The lower die is usually fixed in an apparatus to which movable guides are attached to insure the correct position of the article to be operated on, and the upper is made in the form of a hammer, the handle of which is pivoted so as to insure its descent in precisely the right position. Sometimes the requisite power is applied by simply working the upper swage or hammer itself; but in other cases the head of the swage-hammer is struck with a mallet. Very many beautiful and ornamental patterns are obtained in the same manner as other metallic sheet metal, with a press or other machinery. Many cheap coffin-plates are manufactured at Birmingham in this way; and these and similar articles are sometimes ornamented with a very beautiful method of ornamenting tin wares by producing a crystallized appearance on the surface which was much practised a few years since, under the name of moiré métallique, or crystallized tin-plate. It consists in applying a sheet of tin-plate on a heated plate slightly heated, and then washing with water, and covering with a lacquer varnish, without mix the lustre of the crystalline appearance is speedily lost by the action of the air. Dr. Ure observes that it woul not seem that the acid merely lays bare the crystaline structure really present on every sheet, but masked by a film of redundant tin,' and he gives the following directions for performing the process:—The tin-plate, slightly heated, is to be placed over a tub of water, and to have its base supported by a number of aubergines or small white wares, parts of aquafortis, and two or three of distilled water, holding and part of common salt or sal-ammoniac in solution. When the crystalline spangles appear to be thoroughly burnt out, the plate should be immersed in cold water, with a little cotton (taking care not to rub so hard as to disturb the crystallized film of tin which constitutes the feathered surface), dried with a gentle heat, and immediately coated with lacquer. If the whole surface be not covered with lacquer, the lines of the crystalline appearance may be traced by playing over the surface of the plate with the pointed flame of a blow-pipe.' (Diet of Art, p. 663 and pp. 1283, 1284.) By using coloured varnishes very beautiful boxes and other ornamental articles can be produced by this process.

Manufacture of Tin Alloys.—Britannia Metal—which forms the principal ingredient in various kinds of pewter and other white metallic alloys, which are manufactured into the various wares of table, drinking, and of plate—gives an interesting account of the manufacture of pewter and similar articles of Britannia metal, which may be briefly noticed here. This manufacture was conducted in the city of London, by two individuals by the names of Jessop and Hancock; and the brilliancy, lightness, and cheapness of the wares, which, when well made, are resemble silver, have secured for them a very extensive sale in this and other countries. The extreme fineness with which such alloys may be worked into any shape leads however to the manufacture of many articles of a thin and character that they speedily lose their beauty. Various authorities differ greatly as to the exact composition of Britannia metal, but the proportions given by Holland are 34 lbs. of the best block-tin, 28 lbs. of metallic regulus of antimony, 4 lbs. of copper, and 6 lbs. of brass. The tin is first melted and raised to a red heat, and the alloying metals are added to it. The copper and antimony are successively poured into it from the crucible, and the slag, which have been melted; the mass being metallic during the operation, to complete the mixture. The mass is then being completed by the continued application of fire and pressure, by holes to which molten tin or oxide, in which it is cast into slabs fifty inches long, six inches wide, and one inch thick; or if it is containing small articles, into smaller moulds to form it into convenient ingots. The thick slabs of metal are then divided by passing over an axe, and are cut up into smaller pieces until they are reduced to the required degree of thinness. This operation is performed without any annealing or softening; and the edges of the sheet become little twisted or cracked by it.

Although most articles manufactured in silver are now produced in Britannia metal, and in other alloys of silver...
character, the principal consumption is in candlesticks, tea-pots, coffee-bigins, and other vessels for containing liquids. The feet of candlesticks, the bodies of tea-pots, and other articles containing embossed work, are stamped between dies; and when the shape of the article will not allow it to be stamped in one piece, as in the case of a cylindrical vessel with raised work upon the sides, it is sometimes stamped in halves, which are subsequently fitted and soldered together. Articles approaching the globular form may in like manner be stamped in three or more pieces. In stamping brass, silver, and plated metal the dies are not set so close as those used when gold or silver upon them are executed at a very great expense, but in the manufacture of Britannia metal a cheaper process is followed. Plaster casts are produced of the required pattern, on which original models or designs, or from manufactured articles, are made. The mold, and from the mold moults or dies of fine hard pig-iron, which, with a very little finishing, forms dies fit for stamping so tractable a metal. When very thin, it may even be stamped in dies of brass or of spoon-metal.

The great facility with which this alloy may be moulded to any required form is illustrated by the operation termed spinning, by which the bodies of tea-pots with concentric circular swells are usually formed. A wooden chuck or mould is set in the lathe, and the chuck is removed from the boss of the vessel when completed. When spinning rapidly, the workman bends the plate over the model-chuck by pressing it with tools of hard wood or polished steel until it is brought into precisely the same form as the chuck, and at the same time is prevented from crumpling or latticeing the metal; and such is the dexterity acquired by some workmen, that Holland states that some individuals can spin twenty dozen of these teapot bodies in a day. The form is perfect upon a second chuck. The pairs of articles are usually formed by a stroke in a die previous to the spinning. Spherical articles are, as in the case of stamping with dies, usually formed in two or more parts; but in some instances they are made to overlap the model, which is then composed of several segments, which may be taken out of the finished vessel by removing a centre-piece, in a similar manner to a boot-last.

Many small vessels, spoons, and other articles are cast in an almost unchangeable state, so as to be used as such, as balusters. The facility with which Britannia metal is cast, and run into any shape and cut in the lathe, as for turning purposes and small vessels previously formed by casting, is a great recommendation to the manufacturer. Articles of this kind are much admired in the public. The purities acquired during their formation, by boiling in water containing sweet soap; after which they are polished, either by hand, or more commonly by the buff and brush set in motion by a steam-engine. The buff is a solid cylinder of wood, resembling a grindstone in form, the rim or periphery of which is covered with buff leather dressed with fine sand from the bed of the river Trent, which, after being dried and sifted, is mixed with oil. The buff is a circular but smaller circle of wood, sanded with four or five kinds of sand; it, as well as the buff, is dressed with sand and oil, and afterwards for finishing with powdered rotten-stone and oil. The brush is used generally for such articles as from their form cannot be applied to the buff, and supplied with embossed work. After buffing and brushing, the articles are boiled in a solution of pearlash, and finely hand-brushed and hand-polished by an application of soft soap, a little oil, and powdered rotten-stone. This operation is usually performed by females, as it is found that no instrument can supply an effectual substitute for a soft hand, which is one of the first requisites inquired into when persons apply for work in this department.

TIN TRADE. The history of the trade in tin commences with the very earliest records of commercial intercourse with the British islands. (CASSITERIDES; and PICT.

History of England, vol. i., pp. 91-95.) We shall only notice this trade as it has existed within the last two centuries. Davenant gives some interesting information concerning it soon after the middle of the seventeenth century. In 1683 our exports of tin to all foreign countries amounted to 153 tons; in 1695 to 240 tons; in the three years of peace, from 1698 to 1700, on an average, to 1237 tons; and in the ten years of war, from 1700 to 1710, on an average to 1094 tons. In these last ten years the annual purchases of the Dutch amounted to 300 tons, of the estimated value of 21,574l. Davenant accounts for the great increase in the exports on the ground of the increase of trade in all our neighbouring countries, as being, as well as ourselves, increased in the luxurious way of living; such who heretofore were content with pewter are now served in plate; and such as made use of trenchers, wooden platters, &c., will now have pewter vessels, all which is visible within forty years, and has occasioned this great call of a commodity almost peculiar to us. But the produce of the mines more than kept pace with the increased demand; and when Davenant wrote, Queen Anne had between 4000 and 5000 tons of tin on hand, a quantity equal to four or five years' consumption. 'As the case stands at present,' he adds, 'Holland is the great magazine for tin: the necessities of such as have it upon their hands, either in merchandise or security, drive it thither, and the French, who have been for some time past very anxious of tin, have made purchases from this country, to the damage of the public.' He proposed that a thousand tons of the dead stock should be coined into tin half-pence and farthings. The produce of the mines went on increasing, and the accumulation to which Davenant alludes is only about a year's produce of the mines at present.

In the 'Journal of the Statistical Society of London' (vol. ii., part iv.), there is a valuable paper, by Joseph Carnes, Esq., on the production of the Tins mines in Cornwall, and of the Consumption of Tin in Great Britain, from which we borrow some of the following statements. From 1750 to 1785 the produce of the mines varied from 2273 tons, the lowest amount, to 3005 tons, which was the greatest quantity, in the year 1807: the average for this period was 2757 tons, and the average price 64s. 6d. per cwt. From 1789 to 1818 the annual average quantity was 2975 tons, at 76s. 9d. per cwt. From 1817 to 1837 inclusive, the average annual quantity was 4211 tons, and the average price paid to the miners was 73s. 6d. In 1787 Banca tin was imported into this country for the first time, and the price of Cornish tin soon fell to 56s. the cwt., and would have declined still further if a new market had not been opened. It was in these arrangements with the East India Company, that the greater part of the purchases of the Company were made at low prices, but the tinner's were indemnified by the artificial scarcity which raised prices in the home market. At first the Company paid only 66s. 13. 4d. the ton, delivered on board in London; in 1792 they gave 71s.; and on the renewal of the Company's charter they agreed to purchase 800 tons annually at 75s., and offered to take half as much more at 66s. 13. 4d. In 1809 the difference between the prices paid by the Company and the price of the home market was so great that the tinner was prevented from supplying the Company, and their exports ceased; but in 1811 they agreed to pay 79s., and in 1812, 90s. per ton. The connection finally ceased in 1817, as the supply of the home market had become more profitable.

The gradual increase in the consumption of tin in Great Britain is shown in the following table:

<table>
<thead>
<tr>
<th>Period</th>
<th>Annual Average</th>
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</thead>
<tbody>
<tr>
<td>1783 to 1790</td>
<td>292 tons</td>
</tr>
<tr>
<td>1791 to 1800</td>
<td>232 tons</td>
</tr>
<tr>
<td>1801 to 1810</td>
<td>216 tons</td>
</tr>
<tr>
<td>1811 to 1820</td>
<td>261 tons</td>
</tr>
<tr>
<td>1821 to 1830</td>
<td>275 tons</td>
</tr>
<tr>
<td>1831 to 1840</td>
<td>281 tons</td>
</tr>
</tbody>
</table>

Until 1838 all the Cornish tin paid a duty of 4s. per 120 lbs. to the duty of Cornwall, which, with the fees, was equivalent to 5s. This duty is now abolished. About 10,000 men, women, and children are supposed to be employed in the Cornish mines.

From 1753 to 1790 the proportion of British tin exported...
was 7-10ths of the produce of the mines; in the next ten years it was 3-4ths; from 1800 to 1820 one half; from 1820 to 1830 it had diminished to 2-4ths; and from 1830 to 1847 to 1-5th. The quantity of foreign tin imported, the greater part of which is intended for re-exportation, since 1815 (p. 42) shows—From 1815 to 1831 the annual average quantity imported was 213 tons; exported annually during the same period 224 tons. From 1831 to 1838 the imports of foreign tin averaged annually 1527 tons, and the exports were 1482 tons. This foreign tin can be supplied to Europe and America than the Cornish tin. In 1841 the imports were 28,343 cwt., or 1421 tons, of which 17,915 cwt. were from Singapore, 6197 cwt. from Java, and 3324 cwt. from the East India Company's territories. In the same year the exports of foreign tin were 25,344 cwt., or 1291 tons, to the United States, Holland, Russia, France, Italy, and Germany. The exports of British tin in 1841 were 1287 cwt. France took 8905 cwt.; Turkey, 4061 cwt.; Russia, 2790 cwt.; the United States, 1733 cwt.; and Italy, 1239 cwt.; being more than three-fourths of the whole. In the Custom-House records the quantity of tin manufactures exported is not distinguished, but in 1840 the exports of 'tin and pewter wares and tin plate' were valued at 360,819L. Under the tariff of 1842 (5 & 6 Viet., c. 47), foreign tin-ore will be admissible for the first time, on paying a duty, which is 10s. the ton if from a British possession, and if of a foreign, 50s. But as none of the British possessions contain tin likely to be brought into the English market, the real duty is 50s. The former duty, 10s. per cwt., was probably the quantity of tin annually produced in Banca is estimated at 2700 tons, and in the Malay peninsula about 1300 tons; and these are the parts from which a supply of ore, if any, is likely to be received.

TIN (Medical Properties of). It cannot be confidently asserted that tin in a metallic state has no influence over the human system, as many respectable writers affirm that tin-filings are decidedly anthelmintic, and that this is owing to mechanical irritation of the worms causing them to be detached from the surface of the intestines; it is stated that water in which tin has been boiled, and wine digested in a tin vessel, are also anthelmintic. Others, denying to tin any inherent power over worms, have attributed these effects to the presence of a small portion of arsenic. Be this as it may, it is a very crude method of treating worms to exhibit such a material as tin-filings.

Anthelmintics. Even oxide of tin is of doubtful efficacy, as might be expected from its extreme insolubility. Its mode of action is by occasional meeting with acids in the stomach, as the hydrochloric, and therewith forming a chloride. Two compounds of chlorine with tin are known, one the protochloride, the other oxychloride. Both of these are exceedingly soluble; the latter so much so that it can with difficulty be kept in the solid state, and more frequently occurs in the liquid state, and is called the spiritus humana Libavi, or butter of tin. The former is much used by healers, among whom, when in the solid state, it is called salt of tin, and when liquid, spirit of tin. In the former condition, it has sometimes been mistaken for common salt; it has thus been the source of poisoning, though it is not very active when introduced into the stomach. A few grains of it injected into the jugular vein prove rapidly fatal to dogs. In case of any of it being swallowed, emetics or the stomach-pump, demulcent drinks, and, if necessary, moderate venesection, may be employed, followed after a time by vital stimulants. It has been thought by some to be dangerous to allow fluids containing acids, such as the weak acid wines, or cyder, or even fatty, saline, or albuminous substances, to remain long in tin-vessels, as an injurious action of these on the tin is supposed to occur. If any serious effects have ever followed from such a cause, it is most likely that these vessels were only coated superficially with tin, which being rubbed off, exposed the more potent metal beneath to the solvent power of these substances. It is therefore prudent to examine from time to time all copper- and other vessels to see that the tinning is entire.

TIN PLATE. [Tinners.]
alcoholic tinctures, or more generally simply tinctures; when sulphuric ether is used, they are denominated sulpichetal tinctures.

When wine is used, though differing little from pure alcohol, the term medicated wines is applied to them; and when the process of distillation is employed to aid the extraction, particularly of volatile oils, the result is termed spirit. Such a tincture, which is sometimes conjoined, and the proceeds termed an ammoniated tincture. In some cases less of the principal ingredient is taken up or dissolved when ammonia is used, than when simple alcohol is employed. For the last purpose, some tinctures were called essences, from the term esse, it being thought that they contained only the purer or more refined portion, the alcohol leaving all the base principles, such as the starch, gum, woody fibre, &c., unaltered. All higher degrees of spirit are now thus described.

These terms are now discussed by pharmacists, though retained by the people. Elixirs differ only from being of a greater consistence; they are not unfrequently turbid from the extractive matter suspended in them. Tinctures are further distinguished into simple and compound; they are called simple when one substance only is submitted to the solvent; compound, when two or more are.

Another important distinction among tinctures is founded upon the degree of strength of the liquid in which the principal is nearly pure resin, a strong spirit is needed; when much gum is associated with the resin, a weaker is required. Hence some tinctures are prepared with proof spirit, as the greater number; a few with spirit above proof; and some with rectified spirit.

A well-prepared tincture should be clear, possessing the colour of the article which is its base, and partaking in an eminent degree of its characteristic odour and taste. A tincture of tinctures is a deposit falls down, either from some slow chemical change taking place among the ingredients, or from the evaporation of some of the spirit. This renders old tinctures not unfrequently turbid, and of variable strength. Thus tincture of opium, when newly prepared, contains one grain in nineteen minims, but after some time one grain of opium is contained in only fourteen minims. This inconvenience may be avoided with all recent vegetables, by forming what are termed 'vegetable tinctures.' These are merely the juices of the fresh plant, and should be used, rather than the hydrochloric acid, as the latter will break down the vegetable substance.

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shire, where Matthew was born about the year 1637. In 1647 he was admitted to Lincoln College, Oxford, where Dr. Hickes was his tutor; but he afterwards removed to Exeter College; and he was finally elected to a law fellowship at All Souls, soon after he had taken his degree of B.A. in 1676. He proceeded L.L.B. in 1679, and was created D.D. in 1683. The following year, 1684, he was made master of the Grammar School of the University of Oxford, which was long afterwards made in print by the opponents of his theological opinions, his debauceries while he resided at Oxford were so scandalous as to have drawn down upon him on one occasion a public reprimand from his patrons; and after he obtained his doctor's degree he went over to the Church of Rome, not without subjecting himself to the imputation of having an eye to the worldly advantages which such a step might seem to promise. But his mind, just as it had long been the throne of the path of his life, did not appear however that he actually obtained any court favour or patronage by his change of religion; and, according to his own account, given in a pamphlet he published in his own defence in 1708, he reverted to the Church of England some months before the Revolution, having attended mass for the last time at Candlemas, 1688, and publicly received the sacrament in his college chapel at Easter following. He asserts that his mind, which for some time past was under very strong influence, had been influenced for his part by Januarius Romanus eminently by the notions as to the high and independent powers of the clergy which then prevailed there, and which he had adopted without examination. Accordingly, when he then actually abandoned his cause and left the church principium at the same time; or rather, as he puts it, he discovered that these principles were unfounded, and that at once cured him of his popery. 'Meeting,' he says, upon his going into the world, with people who treated that notion of the independent power as mere delusion, and by the example of the absurdities of popery to be much greater at hand than they appeared at a distance, he began to examine the whole matter with all the attention he was capable of; and soon he found that it. was quite the case. He discovered, that all his former doubts were so far from having any solid foundation, that they were built on as great a contradiction as can be, that of two independent powers in the same society. Upon this he returned, as he had good reason, to the Church of England, which he found, by examining into her constitution, disclaimed all that independent power he had been bred up to the belief of.' The Revolution having taken place, he now also, naturally enough, became a zealous partisan of that settlement, and all the rest of his life, which appears to have resided mostly in London, consists almost entirely of that of his successive publications and of the controversies in which they involved him.

He was an author of a number, 1663, by the publication, in 4to., of 'An Essay concerning Obedience to the Supreme Powers, and the Duty of Subjects in all Revolutions, with some considerations concerning the present juncture of affairs.' This was followed in March, 1664, by 'An Essay concerning the Rights of Sovereigns,' a second edition of which, with additions, was brought out in the same year. This year also he published 'A Letter to the Clergy of both Universities, in recommendation of certain alterations which there was then some talk of making in the Liturgy; and in 1695 another pamphlet in support of the same views. But the first work by which he attracted general attention was an 8vo. volume which he published in 1706, entitled 'A Discourse concerning the Rights of Mankind in the Peace of Religion.' About the same time he came forth a pamphlet, entitled 'New High Church turned (as it appears) by a Christianizer,' in exposure of the pretensions put forward by Sothebey's and party; upon which the House of Commons, in 1707, voted that sermons to be burned, on the 26th of March, 1710, expressly ordered Tindal's Rights of the Christian Church and the second edition of his two 'Defences' to be condemned. The author, who was Tindal, drew from Tindal the same year three more pamphlets— first, entitled 'A High Church Catechism: the second, 'The Jacobitism, Perjury, and Popery of the High Church Priests,' the third, 'The Merciful Judgments of God upon the French Church and the Court of Rome'. This year, 1710, the next year, on the Lower House of Convocation having drawn up and printed 'A Representation of the present state of Religion, with regard to the late excessive growth of Infidelity,' Burrowes, and Profaneness,' Tindal forthwith replied in 'The Nation Vindicated from the Aspersions cast on it' in the said representation. The second part of this performance is occupied with an explanation and defence of what he became the author of a second work in opposition to the assertion of the Convocation, that views went to overturn the foundations of all morality, and of all religion, natural as well as revealed. For some years from this date Tindal's active pen was exclusively occupied in writing pamphlets, which do not appear to have been very effective at the time, and have been long forgotten. It is remarkable however that in so voluminous a work as Coke's 'Memoirs of the Robert Walpole, no notice should be taken of a personal controversy in which he was engaged and in which he had been defeated. Walpole, on the other hand, has been accused Tindal of a treacherous desertion to the opposite faction as soon as he found that Walpole had been about to deprive of power. It is probable that these were some misunderstanding on both sides. In any case this miniatirual rupture was merely a personal quarrel in which little or no public principle was involved. It is said, however, that when Tindal had published 'An Address to the Inhabitants of the two great Cities of London and Westminster,' in reply to a pastoral letter which the bishop of London, Dr. Gibson, had addressed to the clergy of England and other recent deistical writings. 'A Second Posthumous Letter,' soon after published by the bishop, called forth 'A Second Address' from Tindal; and both addresses were printed in the same year, in 8vo. volume, with alterations and additions.

From this date Tindal seems to have remained quiet to the year 1730, when he produced, in a 4to. volume, on work by which he is now chiefly remembered, his 'Christian History Old and New Creation, or the Tradition of the Nature of Religion.' The object of this was, as is indeed sufficiently, declared in its title, to contend that there is nothing more in Christianity, properly understood, than what the human reason is quite capable of discovering for itself, and by implication that deep-seated special revelation has ever been made by the Deity to man. It did not however contain any express denial of the truth of Christianity, of which indeed the author and publisher had continually promised, but without new defence stronger than any that had been previously thought of. Tindal, 'said Warburton, some years after, 'a kind of bastard Socraates, brought our speculations from heaven to earth; and, under pretense of advancing the antiquity of Christianity, laboured to undermine its original.' The book made a great deal as
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various answers to it soon appeared, the most noted of which were the De, Dr. Waterland's 'Scripture Vindicated,' 1730; 'The Usefulness, Truth, and Excellence of the Christian Revelation defended,' by Mr. (afterwards Dr.) James Foster (the eminent dissenting clergyman), 1731; 'A Defense of Revealed Religion,' by Dr. Conybeare (afterwards bishop of Bristol), 1732; and 'An Answer to Old as the Creation,' by the Rev. John (afterwards Dr.) Leland (another learned and distinguished dissenting divine), 1733. The book is also discussed in the last-mentioned writer's more celebrated work, his 'View of the Protestant Religion,' the history of which is thus described: 'He defended himself in Remarks on Scripture Vindicated, and some other Later Writings,' published along with a new edition of his 'Second Address to the Inhabitants of London and Westminster,' in 1730. But this was his last production: his health now began to give way, and he expired on the 18th of August, 1733, at a lodging in Cold Bath Fields, to which he had been prevailed upon to remove a few days before from his chambers in Gray's Inn. Tindal never held any preferment except his fellowship; but it is stated, in the 'Biographia Britannica,' that in the reign of King William he frequently sat as judge in the Court of Delegates, and had a pension of 200l. a year granted to him by the crown for his services in that capacity. He married Sarah Walpole, the sister of Robert Walpole, and among his avocations was a advocate in the courts of civil or ecclesiastical law; which would seem to imply that he had been called to the bar, or been admitted an advocate at Doctors' Commons, although that fact is not mentioned. A new edition of his 'Essay on the Bribery of 1733,' appeared in 1747, and was dedicated to the late Lord Walpole, the late Lord Bath, and to His Excellency the Earl of Granville, who had obtained a last men- tion under the name of Tindal, 'was principally written by Dr. Birch.' There is no hint of this in the very full and elaborate Life of Birch, in the second edition of the 'Biographia Britannica,' which is stated to be compiled from his own papers and communications with friends and persons,' his papers,' Coxe proceeds, 'in the Museum and in the Hardwicke Collection, which I have examined with scrupulous attention, and various other documents which were submitted to his inspection, and to which I have had access, prove great irregularity of judgment in selection, and fidelity in narration. He derived considerable assistance from persons of political eminence, particularly the late Lord Walpole, the late Earl of Hardwicke, and the Honourable Mr. Pitt, but the account of the Partition Treaty was written by the late Earl of Hardwicke. The account of Lord Somers's argument in Barker's case was written by his great-nephew the late Mr. C. Yorke. I can also trace numerous communications by Horace Walpole, though they cannot be so easily specified. Birch was a staunch Whig, but his political opinions have never led him to forget his duty as an historian. He has not garbled or falsified debates, or misstated facts; he has not wantonly traduced characters, or tillipised events, or grossly misrepresented the real cause which he disapproved; but in his whole work, whether he praises or blames, there is a manly integrity and candid temperance, which must recommend him to the reading reader. This is another advantage of the Continuation of Rapin: but, although in some parts the work has a claim to be considered as an original authority, it is in the greater part not only a compilation, but a mere transcription from preceding writers. The authors indeed frankly state in their prefatory notice that they have not scrupled to copy or imitate any part of the several authors they have made use of, when conducive to the usefulness of the work, or where there was no occasion to alter or abridge. The numerous documents inserted at full length make the Continuation a convenient repository of authentic information; and the notes which accompany the translation of the preceding part of the work add greatly to the value of the original text. Tindal's other publications were—the pamphlet relating to his uncle William (as above), an abridgment of Spence's 'Polymetia,' under the title of 'A Guide to Classical Learning for Schools,' and a translation, from the Latin, of Prince Campani's 'History of the Growth and Decay of the Othman Empire,' which appeared in 1748.

TINIAN is one of the Ladrones or Mariane Islands [vol. xili., p. 281]: it lies near 15° N. lat. and 146° E. long. It is uninhabited and of small extent. It owes its name in the world not to its real importance, but to the circum-

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stances, just one fact, that it has remained there nearly two months, from 26th of August to the 21st of October, 1742, and that in the account of his voyage a description of the island is given in glowing colours. It extends about 12 miles from south-south-west
to north-north-east, and the breadth is about half as much. The soil is somewhat sandy, but very dry and healthy. The land rises in gentle slopes from the beach to the middle of the island, but the ascent is often interrupted by small valleys, many of which are covered with a clean turf composed of very fine trefoil and intermixed with a variety of flowers. There are no running streams, but good water is found by digging a few feet below the surface near the sea. The islands are three small lakes. Black cattle, in a wild state, are numerous, and at the time of Anson’s visit the number was computed to amount to at least ten thousand. Our common domestic fowl is plentiful in the woods, and several kinds of wild fowl are found in the island. There is also an abundance of wild hogs. Besides the cocoa-nut palm and the breadfruit tree there are guavas, limes, and sweet and sour oranges, and antirrhinum plants in great abundance, by the use of which the crew of the Centurion, the vessel commanded by Captain Anson, which was sent with small stores and medical supplies, was restored to health in a short time. There is no harbour, but only an open roadstead near the south-western extremity of the island, which is dangerous during the prevalence of the western monsoon, from June to October. This island was frequented by Portuguese during the year 1725, in a paper which was translated by Ratty, and published in the 35th volume of ‘The Philosophical Transactions’ (No. 266, published 1727). Anson remarks, that the mean ofаг 1/2 plates, or, as they were sometimes called, latres or lates, was not commonly practised in England, notwithstanding the great consumption; and that we were obliged to import our own tin to Germany, and to purchase the alloys of lead and copper when manufactured. Anderson (Hist. of Commerce, vol. iii., p. 230) states that about 1740 the manufacture of tin-plate was brought to such perfection in England that very little was imported from foreign countries, and that the quality of British tin was far superior in purity and fineness of surface, owing to the plates being drawn under a rolling-mill, instead of being hammered, as was common in those made beyond sea. The difficulty of extracting tin, in what may be called the modern manufacture, is, in wetting the tin-sheets, with a perfectly smooth and clean surface, which is essential to the adhesion of the metal to an equal film, was one of the principal obstacles to the progress of this department of the art of tinning.

The art of making tin-plate is essentially a thin coating of tin which exists between tin and the metals to which it is applied, and it consists, essentially, in rendering the sheet to be tinned perfectly clean and free from oxide, and then bringing it into contact with melted tin, which forms an alloy with the harder metals, until it has an appearance, and protects it from oxidation. The hardening of the sheet-iron, as the most important application of this process, will be first noticed. This operation is usually described by Mr. Parkes, in the paper above cited, and which, from that it has been adopted, the following description is condensed. Réamur’s statement of the German process, in the ‘Philosophical Transactions’ may also be consulted by those who are curious about the details of the earlier method of tinning, which seems to be that about to be described in all essential points.

The finest English or Welsh bar-iron, prepared by charcoal, instead of mineral coke, and known to the trade as tin-iron, is used for making tin-plates. The material for tin-plate is a thin sheet of iron, from six to eight inches wide, and weighing about an ounce. The bars are made red-hot, and extended by passing them between rollers, until they are reduced to about three-eighths of an inch in thickness. When cooled, the pieces are cut by shears, worked by machinery, in lengths of about ten inches by six, which are repeatedly reheated and rolled, until they are reduced to as thin a state as the process will conveniently allow. The sheet is then divided and again rolled until it reaches in thickness one-half of which it is doubled again, and rolled until still diminished in thickness. When thus brought to an acquired thinness, the thin sheet is cut into plates of the required size to suit the market (most commonly about three-quarters of an inch in breadth), which, after being cut and trimmed, are separated,—an operation which needs the application of considerable force, as the compression of the metal causes them to adhere strongly together. Parkes states that the cutting of the plates was, when he wrote, a work of considerable labor, and that his brother, who was smith in Glamorganshire had invented a machine for the purpose, which was impelled by a water-wheel, and which cut a quantity equal to a hundred boxes of two hundred and twenty-five plates each, in a day, which is four times more than is done by hand. After the threading, the plates are piled in heaps, one being a cross-wire at intervals, to separate the number required from a box. That name is technically applied to the number of the plate and not the number of the cases, although it is not until they are completed to the plates are actually placed in boxes.
The next operation to be performed is the removal of every particle of oxide or other impurity from the surface of the plates. For this purpose each is bent to an angle of about 60°, so as to bring it into the form of an inverted A or Z, and then steeped for a few minutes in a leaden trough containing liquid hot dilute sulphuric acid, or 3 parts of acid to 1 gal. of water, containing 6 pounds of acid to 3 gallons of water makes a mixture of the proper strength, and sufficient for eighteen hundred plates. After being immersed for four or five minutes in this liquid, the plates are taken out, arranged in the floor in single file, and then removed, by means of the iron rod, to a reverberatory furnace or oven, in which they are submitted to a red heat. The reason for bending the plates now becomes obvious, because if they were flat, the two sides, instead of being in direct contact, would be forced away from each other, and thus the plate would be exposed to the air, and could not be heated equally on both sides. The heat to which the plates are exposed, combined with their previous washing in the acid, causes them to throw off a scale of rust or oxide, whereby this operation is termed *scaling*. If well performed, it gives to the iron a mottled blue and white surface, somewhat resembling marbled paper. The plates are then removed to a bath of slighdy acid, and immersed to a second or cold rolling, which removes any warping acquired in the previous processes, gives a high degree of smoothness to their surfaces, and imparts elasticity to the iron. The rollers, or *rolls*, employed in this operation are long rollers of iron, 3 or 4 inches in diameter, and 2 to 3 feet in length, cast in thick cold iron boxes or moulds, and their surfaces are carefully polished. Parkes states that rollers of about thirty inches diameter are much better than those of smaller dimensions for this purpose; the length of the rolls is usually seventeen or eighteen inches. After the cold rolling the plates are immersed singly, in a vertical position, in an acridulous preparation called the *lye*, consisting of water in which bran has been steeped for nine or ten days, until it has fermented to give off a liquid resembling the water in which the plates are kept for ten or twelve hours, and occasionally turned, to insure an equal exposure of every part of their surface; and from the lye-trough they are transferred to a leaden vessel containing dilute sulphuric acid, the strength of which is varied according to the judgment of the workman. This trough is divided into compartments, which will contain a box of plates each; and both it and the lye-trough are slightly heated by flues, to assist the action of the acid menstrum. Parkes states that a temperature of 90° or 100° Fahrenheit is sufficient for this operation, which is called *pickling*, and which requires some nicety, to prevent the plates from being strained or blistered by remaining too long in the acid. They are usually aged in the pickling house, where they remain until they become bright and free from black spots. They are then removed into pure water, in which they are so accoutered with hemp and sand, to remove any remaining oxide, or other superfluous impurities, that it may not accumulate in the rolls, until wanted for picking, because, even if left for months, they will remain perfectly free from rust.

As the sole object of these operations is to cleanse the iron plates from rust and dirt, it is evident that the details may be varied considerably; but it is not necessary to notice particularly any deviations from the usual process. The *tinning* of the plates is effected in a range of cast-iron pots heated by flues, and forming together an apparatus called the *tinning bath* or *tinning pot*, or the pot, which contains enough melted tin to form a layer a quarter of an inch thick. The soldering of tin being thus melted, is shaken off by a smart blow with a stick, leaving only a faint stripe, which may be discerned upon all finished tin-plates. After heating the plate in the vessel from grease by rubbing them, while yet warm, with dry bran; after which they are packed in boxes of wood or sheet-iron.

The tinning of the inner surfaces of cooking utensils and other vessels of capacity is performed by securing the surface until it is perfectly bright and clean; then heating the vessel, pouring in some melted tin and rolling it about, and rubbing the tin all over the surface with a stick of cloth moistened with lye-trough, which may be used, as in soldering, to prevent the formation of oxide, which would impair the mutual affinity of the metals. Pure grain-tin should be used for this purpose, but it is frequently adulterated with lead, by this means vessels

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of copper, brass, and cast-iron are tinned internally, and thereby rendered fit for the most delicate culinary operations; and in a similar way any small portions of iron-plate may be coated with tin. Bridge-bits, stirrups, and many other small articles, are tinned by immersing them in a galloë bottle of stone-ware, with an oval body and a narrow neck, together with a quantity of bar or grain tin, and of sal-ammoniac. This vessel is then to be closed, and laid on its side over a charcoal fire, made upon a forge-hearth, and by turning it round, and frequently shaking it, the tin is to be uniformly distributed over the surfaces of the enclosed articles. When tinned they are taken out, washed in water to remove the sal-ammoniac, and dried in warm sawdust. The great advantage of the process consists in the employment of the stone-ware bottle, which prevents the dissipation of the fumes of the sal-ammoniac, and gives up the whole of the tin, which no metallic vessel would. The method of tinning pins is described under Pin, vol. vii., p. 161.

(Memoirs of the Literary and Philosophical Society of Manchester, second series, vol. iii., pp. 347-80; Philosophical Transactions, December, 1728; Manufactures in Metal (in Lardner's Cabinet Cyclopædia, vol. iii.); Ure's Dictionary of Arts, &c.)

TINNITUS AU RİUM, ringing in the ears, may arise from many different conditions. It is sometimes due to an unnatural state of the circulation in some part of the ear, the movement of the blood producing a vibration of the nerve which the mind does not distinguish from that produced by sonorous vibrations of the air. But most frequently the sensation is due to some disordered state of the auditory nerve, and is entirely subjective. It is thus perceived in some diseases of the brain, in nervous persons, and in those who are much debilitated; and is a common sign of organic disease of the auditory nerve itself. It is analogous, in these cases, to the subjective sensation of sparks and flashes of light which is perceived in cases of disease of the retina or optic nerve. It may therefore be a sign of a dangerous condition, or a prelude to complete deafness; but in the great majority of cases it is unimportant, depending on some local temporary affection of the ear, or on some disturbance of the digestive organs with which part of the brain sympathizes.

TINNUINCULUS, Vieillot's name, for the antients, for a genus of Falconides. Type, Tinnunculus alaudarius, Linn. ; Falco tinnunculus, Linn., of which we proceed to give M. Temminck's Description.—Wings reaching to three-fourths of the length of the tail; upper plumage of the male varied with numerous black spots; quills striped internally; claws always black.

M. Temminck states that this short indication is inserted to enable the observer to distinguish at the first glance this species from the Falco tinnunculoides (Cresserette, or Lesser Kestrel), and he then proceeds to give the following details relating to the former:—

Male.—Top of the head bluish-grey; upper parts reddish-brown, regularly sprinkled with angular black spots; lower parts white, slightly tinged with reddish and with oblong brown spots; tail ash-colour, with a wide black band towards its extremity, and termined with white; bill bluish; cere, space around the eyes, iris, and feet yellow. Length about 14 inches.

Female, larger than the male; all the upper parts of a brighter reddish; lower parts yellowish rusty, with oblong black spots; tail reddish, with nine or ten narrow black bands, and with a large band of that colour near its extremity, which is terminated with reddish-white.

Male in winter has the upper parts of a reddish hue spotted with black; the top of the head more or less clouded with bright blue; the plumage variegated with white; sometimes entirely white.

Female in winter on the top of the head, the nape, and the mantle brown-rusty streaked with black; these streaks form the angle of the back; on the first quills are seven reddish and whitish spots; tail reddish, undulated with grey-sah and transversely striped as in the female; throat reddish-white; at the opening of the bill a small black stripe which is prolonged on the upper part of the neck; the rest of the lower parts whitish-rusty with oblong black spots; iris brown; cere yellowish-green.

This is, there can be little or no doubt, the (Cnestus) of Aristotle (Hist. Anim., ii. 17; vi. 1: viii. 3), and so most zoologists are disposed to consider it as well as that it is the Tinnunculus of the ancient Greeks. (Play, Nat. Hist., x. 37.) It is the Pustreccio, Cestrel, Trinunculo, Acetello Falchietto di Torre, Gieso, and Ganiemello of the modern Italians; Cessarello, Cesserelle, Cresterelle, and Eprever al Lometti of the French; Turmfalke, Rothei-geyer, Mouseticks, Windenschlick, Busch-geyer, and Wannen-ather of the Germans; Kyrko-falk of the Swedes; Kestrel, Stannel, Stonegall, and Wild-hawk of the modern British; and Cudylj of the ancient British.

Geographical Distribution.—Europe generally, but not habitually beyond the regions of the artico circle, where its place is occupied by the Mergus, England, Scotland, and Ireland. Smyrna, in winter at least Strickel... Africa, from the north to the south, according to Temminck, Senegal, according to the same authority. The Linnean Society have received it from the Cape of Good Hope Asia, India (Selby); banks of the Ganges Yatow (Horse); Japan (Siebold and Bürger). M. Yarrell states that figures of it occur in drawings from Chaa.

Habits, Food, ±c.—The provincial name: Windowh well expresses the most striking characteristic of this hawk. With its head to windward, whence Mr. Mozes suggests that one of its designations should be Windese, not 'Standgate,' not Stonegal; it remains with open tail and winnowing wings suspended high in air, as if its piercing eye may include a considerable area in which no field-mouse is safe: when the bird sees one, it drops unerringly on the surprised prey. When thus poised above the fields, it sometimes is within the range of a gun. We have heard farmers exult in bringing one down, but thinking that the bird was then on the watch for one of their greatest enemies. Mr. Waterton has pleaded to cause of the Kestrel well, and shown how greatly it is the friend of the agriculturist. But though mice are its prey, it undoubtedly preys upon small birds, and also on bees and their larvae, and earthworms. Mr. Selby saw a hawking after cockchafers (Melolontha vulgaris) late in the evening. He watched one with a glass, and saw for
bird dart through a swarm of those insects, seize one in each claw, and eat them on the wing. The kestrel returned to the charge again and again, and Mr. Selby ascertained the cause of this, for he afterwards shot the bird.

If a kestrel can make a nest with a high perch as a receptacle for its eggs, it will not take the trouble to make one; indeed, it probably never does build: sometimes it lays upon the bare ledges of rocks and in old ruined towers. The most suitable places for the nest are those or five, and those ground-colour reddish-white, which is mottled closely with dark reddish-brown and sometimes blotched with reddish-brown. The young come forth from the egg towards the end of April or beginning of May, and are covered with a yellow down. In the egg they are snow-white.

In the Portraits d'Oyeuse, the following quatrains sum up the qualities of the Kestrel —

*Malois, Lenara, Reis, et autre vermaine
Elle est venue à notreCourier,
Elle est venue avec la Colombelle,
Quclle defile des oyeuse de regne?*

The allusion here made to the friendship of the Kestrel for the Dove is probably taken from the passage in Pliny to which we have above called attention.

N.B. M. Brehm would make three distinct species from this hawk, under the names of, 1st, Hochkopfluger (high- head); 2nd, Mittelkopfluger; and 3rd, Rundkopfluger (flat-headed). Upon this M. Temminck drily observes that those who wish to multiply the catalogue of names and of species in favour of each accidental or local variety, may consult the work of M. Brehm. [FALCONIDÆ, vol. x. p. 348.]

TINITORETTO, J.A./COPO, one of the most celebrated painters of modern times, and one of the heads of the Venetian school, was the son of a dyer (Tintoretto), whence the agnomen of Tintoretto: his family name was Ruffi; and he was born at Venice in 1512. He exhibited a remarkable facility for drawing at a very early age, which induced his parents to place him in the school of Titian. Ten days however after young Tintoretto had entered the school of the great painter, he was sent home again to his parents; Titian's attention being attracted by some very spirited drawings he saw in his studio, he inquired who made them, and upon Tintoretto's acknowledging himself the author, Titian ordered one of his scholars to conduct the boy home.

This remarkable rebuff in the career of the young painter seems to have added vigour to his energies, and he commenced a course of indefatigable application. He purchased some casts from the antique and some from the models, from the picture of John the Baptist, and the Picture of Michael Angelo of Morning, Twilight, Night, and Day, at the tomb of the Medici, in San Lorenzo at Florence, resolving to follow the style of Michael Angelo in design, and to combine with it the colouring of Titian,—which intention he proclaimed to his visitors by the following line, which he wrote upon the wall of his apartment:—

*Il disegno di Michel Angelo, e l'colorito di Titano.*

By day he copied pictures by Titian; and by night he made drawings upon coloured paper, with chalk, from his casts, lighted merely by a candle; by which means he acquired a very quick and shrewd, and a peculiarly for which all his works are conspicuous. To these studies he added the occasional study of the living model and of anatomy; and to attain a still greater mastery of chiaroscuro, he used to make models of figures in wax, and placed above them the pictures of Michael Angelo of Morning, Twilight, Night, and Day, for the light as he required it: he also suspended models and casts from the ceiling, for the purpose of becoming familiar with various perspective views of the figure. In addition to these studies, he copied much gratis from Schiavone in colouring. Tintoretto's first picture which attracted notice was one containing portraits of himself and his brother, by candle-light, himself holding a cast in his hand, and his brother playing the guitar. He exhibited this picture in public, and shortly afterwards he exhibited a large historical piece upon the Rialto, which gave him a rank amongst the great painters of Venice. He undertook every commission which offered itself, and frequently painted large works merely for the price of the materials. It would be impossible to enumerate all his works here; they amounted to many hundreds. One of his first great works in fresco was a façade in the Arsenal, which he painted in 1546, representing Balassazar's Feast; and the Writing upon the Wall, 1548, which he also performed. The following were the most remarkable:—The Tiburtine Sibyl, for the church of Santa Anna; the Last Supper, and the Washing of the Disciples' Feet, for the church of Santa Maria della Visitazione; and the Assumption, which he executed for the church of the Trinity, The Temple of Solomon, and the Death of Abel, besides some others.

Tintoretto was so eager for employment, and so desirous of public notice and applause, that rather than be inactive he was occupied with the public work. He first voluntarily offered his services, or at most required no further outlaw from his employer than would cover the cost of the materials. He painted upon such terms the façade in fresco of a large house near the Ponte dell'angelo; on the lower part of the house he painted a very spirited representation of a cavalry battle, above which he placed an ornamental cornice in bronze; over this he painted a large historical composition containing many figures; between the windows he introduced various figures of women; and at the top a rich frieze: the great extent and the boldness of these paintings astonished the Venetian painters of that period.

Upon very similar terms he executed two great frescoes, at Santa Maria dell' Orto, where he painted, in 1550, 100 duets, and the façade containing a picture in the following order: one was the Procession of the Jews with the Golden Calf, and Moses upon a rock in the background receiving the Tables of the Law; which were supported by a group of mediocris angels; another was a representation of the Last Judgment, containing an immense number of figures in an extraordinary work, which, in the opinion of Vasiari, would have been perhaps without its rival as a work of art, if the execution of the parts had been equal to the conception of the whole.

The following works also are accounted amongst Tintoretto's masterpieces:—Saint Agnes restoring to life the son of the Prefect, painted for the chapel of Cardinal Contarino; the Miracle of St. Mark, called 'Il Miracolo dello Schiavone,' where the saint delivers a Venetian, who had become a Turkish slave, from a punishment ordered by his master, by rendering him invulnerable, so that hammers and other instruments of torture were broken upon his body without hurting him; this picture, which is generally considered the best of all Tintoretto's works, was painted in his thirty-seventh year, for the brotherhood of St. Mark, and when it was finished and put up, the worthy friars disputed with one another about the price, a dispute which Tintoretto, by ordering the picture to be taken down and sent home, and telling the brotherhood that they should not have it at any price. He however, after some entreaty, restored it to its place and received his own price, and the friars further gratified him by ordering three other pieces of the same kind,—the Exhumation of the Body of the Saint at Alexandria, through the two Venetian merchants Buono da Malamocco and Rustico da Torcello: the Translation of the Body to the Ship; and the Miraculous Preservation of a Set of a Saracen Sailor through the Saint: the miracle of the slave is in the Academy of Venice; it has been engraved by J. Mathan; the other three are in the Scuola di San Marco. Pietro di Cortona is reported to have said that of all his pictures, that of the Death of the Virgin, which he painted for the Madre Cappellani, an Assumption of the Virgin, and a Circumcision of the Infant Christ, painted in competition with Schiavone; and a Marriage at Cana, now in the church of Santa Maria della Salute. The Miracolo dello Schiavone, the Crucifixion of San Rocco, were of a most magnificent kind, and were among the only pictures to which Tintoretto put his name. There is an engraving of the Marriage at Cana, by Volpato, and a spirited etching by E. Fialleti.

Tintoretto executed many great works for the governo
TINTORETTO painted at Venice eight friezes for the duke of Mantua, recording the duke's feats, to be placed in his castle. But in the duke's lifetime, with his family, and was splendidly entertained by him. He painted also the portrait of Henry III. of France and Poland, when that king visited Venice; of which picture Ridolfi relates a curious history. Tintoretto was engaged with Paul Veronese in painting some figures in the church of the Archangel Michael, which was the church of the Convent of the Scrutinio, over the Turks in 1571. He painted many other works in the ducal palaces, historical and allegorical, commemorating the history of Venice, of which the most famous are the capture of Zara by storm; and the great picture of Paradise, upon canvas, 74 feet by 34, containing a surprising number of figures. This was his last great work; he commenced it in several pieces in the Scuola Vecchia della Misericordia, and finished it, with the help of his son, in its place on the ceiling of the great council-hall of the Senate, now the library.

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in a direct line south-west of Dublin, or 103 miles by road through Castle-Dermot, Carlow, Leighlin Bridge, Kilkenny, and Cuffesgrange.

Surface; Geology; Bogs.—The Knockmeadeown Mountains, on the south border of the county, where it is conterminous with Cork, rise to the height of 2700 feet above the sea, their steepest and most precipitous face being formed of clay-slate, partly bordered on the flanks by sandstone, and on the higher grounds sustaining isolated caps of the same rock, or upholding more continuous mountain-masses. The position of the sandstone on the flanks is generally conformable with the upheaval of the subjacent clay-slate, but the masses on the higher grounds approach more and more to a horizontal arrangement. This tract (of clay-slate) is surrounded by floetz limestone, which is of a much different character, but of a similar formation. The northern face of the Galtees, towards this narrow valley, is in many parts extremely precipitous, and even inaccessible: the southern face, towards the feder valley or limestone plain, which separates them from the Knockmeadeown Mountain, is of a tamer character. The strata of the sandstone are, in the upper region of the Galtees, almost horizontal, yet gently curved, following the form of the summit, and precipitously broken off on the sides, where they frequently crop out. On the flanks, where they are not abruptly broken off, they become more inclined, and appear to be conformable to the surface of the clay-slate on which they rest. The sandstone varies much in character, but in general it is a fine-grained rock, composed of grains of quartz closely aggregated. The sandstone of Slieven-na-Muck yields excellent flaggs.

In the south-eastern corner of the county, north of Croom and Carrick-on-Suir, is a group of Hills called Slievena-na-Man, the geological character of which is similar to that of the Knockmeadeown mountains, shale and sandstone alternates, and consists of a nucleus of clay-slate, surrounded and surmounted by sandstone.

In the centre of the county is another important range, it including an unusually thick covering of till, and north of Limerick, near the little river Mulkerne, or Billoo, which joins the Shannon a short distance above Limerick. At this extremity the range is known as the Doon Mountains; but as it extends north-eastward into Tipperary, the most important summits are known as the Bilbo and Keepers Mountains (the latter 2100 feet high) and the Devil's Bit; it crosses the county of Tipperary in a north-eastern direction by Templederry and Roscrea, becoming narrower as it advances, and enters Queen's County and King's County, which it separates from each other, and where it is known under the designation of Slieven Bloom. The geological character of these mountains is similar to those already described: Keeper and Bilbo and the adjacent parts of the range consist of clay-slate in the principal stratum, except for a small space on the north-west side, near the village of Silvermines, where, at the foot of the hills, the clay-slate comes in contact with and immediately supports the floetz limestone. To the north-east of Templederry the range is elevated, and the strata of the clay-slate varies in this mountain-range. The sandstone in one part, near Newport, on the west side of the range, is a coarse red conglomerate, and rests unconformably on the Suir, two small streams, which unite into the Shannon in these mountains, at Lackamore, five miles east of Newport. There are three veins, one of them thicker than the rest, and bearing rich copper-ore in bunches. The workings on these veins were extended 700 feet in length and 150 feet in height, and the ore is of the water-washed type. The mines were still further worked, but the machinery was insufficient to keep the mine free from water.

Considerable quantities of lead mixed with silver were obtained first century in an opening at the junction of the coal-field and the limestone, Silvermines. This opening had already filled with clay, sandy clay, sand, decomposed slate, and scattered blocks of limestone, Lydian-stone, and sandstone, the whole mass being supported by metallic depositions of various kinds; and in this 'softness,' as the miners termed it, the operations were conducted.

Near the lower part of Lough Dergr, one of the lakes through which the Shannon flows, are the Arra Mountains, forming a part of the larger group of mountains, extending north-west, and extending across the Shannon into the county of Clare (where they are known by the name of Slieven Berragh); they consist partly of clay-slate and partly of sandstone, but on the narrow eastern side of the mountains which yield slate not inferior to that of North Wales.

The rest of the county is occupied by the floetz limestone, except a portion of the district between the southern groups of mountains (Slievena-na-Man and the Galtees) and the Central range, which is occupied by the coal-field of Killalaule, and or one or two small tracts on the western side of the county, where trap rocks appear interstratified with the limestone. This floetz limestone presents in its connection with other rocks and in its organic remains a close resemblance to the limestone of Derbyshire and the north of England; but differs in this, that the tract occupied by it forms an extensive plain, marked only by slight undulations.

The coal-field extends about eighteen miles in length from north-east to south-west, from near the river Nore to the neighbourhood of Cashel, and about six miles in breadth. It is partly in this county and partly in that of Kilkenny. There are two very small outlying portions near Clogh and Ballycoor. The coal-bed, which is a very low range of hills, placed upon the floetz limestone, and elevated above it. It varies in its elevation, being highest and most abrupt on the north-western side, where the hills rise from 300 to 600 feet above the limestone plain. On this side the dip both of the limestone and superincumbent coal-strata is greater than on the other side. Towards the south-east the surface declines gradually, and the streams which water the tract mostly flow in that direction. The strata are more gently inclined here. The aspect of the hills varies, but they are commonly rounded with intervening hollows. The junction of the limestone with the coal-formation is generally at the foot of the hills, but sometimes half-way up their side. Immediately above the hills, one or two beds of each: the upper gristone, when not covered by the superior beds, constitutes the main body of the elevated part of the coal-hills: it is marked by repeated undulations, with intervening hollows, the gristone beds having their greatest extension or length generally from north-east to south-west. In these troughs the coal-beds are found resting upon fire-clay, which intervenes between them and the gristone and forms the floor of the coal, and covered by shale, grit, and then shale again. Sometimes this series is repeated so as to give two seams of coal. The troughs are generally from fifty to seventy yards deep from the surface to the coal, near the centre of the mountain, and from 500 and 700 yards wide at the surface. The coal is of the nature of blind-coal or anthracite. The coal-works have been carried on with increased activity of late years; before 1825 the yearly produce was valued at about 12,000£; since that period it has been nearly doubled.

In the eastern part of the county: one continuous line of bog extends from the border of the coal-field, near Killalaule, to the south-easterly part of the central range of hills at Roscrea, a distance of nearly 30 miles; and towards the south-west the boggested on this, and some in the northern part of the county, between the Lower Brusna and the Shannon.

Hydrography and Communications.—The greater part of the county is comprehended in the basin of the Barrow and its tributaries, which unite with the Shannon above Portumna. A small part on the eastern border is drained by the Minster, or King's River, a small affluent of the Nore, which itself is an affluent of the Barrow. The Nore rises in this county, but has its course chiefly in the county of Tipperary and near the Suir, which rises north of Templemore, on the south-eastern slope of the mountains that there cross the county, and flows by Thurles, Golden,
large, and are occupied by gentlemen, but there are not so many of them; the quantity of grazing-land had been very considerable five years previous to 1795, but it has declined ever since, and was at the period to which the measurements relate greatly reduced. The pastures having been converted into tillage. Farms are generally bounded by double ditches; fields are divided by single ditches, and are generally enclosed by hedges. Some of the land from cattle trespassing is trifling. The ground is left to grass for six or eight years

Rents have been decreasing, and was estimated that they were reduced from the preceeding period of 20 to 30 per cent. The Irish acres is in general use. Yards at the time of the inquiry were generally held under lease, but the granting of leases was going into disuse, and the custom of which the leases had fallen in during the preceding 14 years at least 20 times by the conveyance of a term of farm leases is thirty-one years, or three lives. Cottage and glebe lands are commonly let for twenty-one years. The inquiry, it has not been usual to grant leases to tenants in common; such leases had been found erroneous; they had prevented draining and improving. About one-fourth of the barony was at the time of the inquiry held under middle-men, but the system of tillage was going into disuse; and though leases do not usually contain such mandatory clauses as that the lessor should expend the necessary expenses of cultivation, it is understood that the lessee is not to sublet. There has been a disposition in the landowners to consolidate small holdings; but where ejectments have taken place they have been resisted by the peasantry, and threats have been made and our lands are used of very little purpose, and the occupation of the vacant land: considerable difficulty has thus been placed in the way of consolidation.

The average rent of land is not given; the common expression for small and medium-sized farms is however so great that when a recess occurs men will bid more than they will allow them to make a subsistence from the land: and in most cases the average tenant cannot obtain more than a bare subsistence. The rent of these small holdings is generally paid in horse, cattle, or in goods. The system of tillage is 25 per cent, but when let as con-acre it brings a higher rent, which is usually paid in money, except when a tenant let land to his own labourers. Dairy-land is worth in an acre, more than tillage-land, and grazing-land is more valuable.

The usual rotation of crops is threefold: potatoes, wheat, and oats form the series, and the land will bear to a very great extent. The potatoes are of the common white potato, because, though of inferior quality, they grow more freely and on more exhausted. Potatoes are generally cultivated with the spade, but the practice of drilling them in by the plough is becoming more common: followers are occasionally resorted to, though not to much to rest the land exhausted by the frequenting of the potato crop as to clean it from weeds: followers are generally manured with lime, which is burned with ease small-coal from the coilleries in the county.

Wheat is more commonly grown after potatoes than after fallow: the seed is generally sown as late as during the season, and is generally manured. Many of the smaller farmers break the lands with a wooden malt. Many of the wheat of the finest quality: a good deal is threshed out by the fallow, and immediately after harrowing may pass with the market after other debts: the large farmers do not off their food any

November.

The cultivation of clover, rye-grass, and vetches is much improved, because the borders of mangel-wurzel are cultivated: the potato is generally cropped for feeding cattle. The clover is left on the ground only one year, and is mown twice and then ploughed in.

After the common rotation of crops has been taken once or twice, or on some of the best lands three or four times, the ground is left to grass for six or eight years.
Grass or clover seeds are usually sown with the oats the last crop of the tillage course; and for the two following years the produce is mown, and then grazed until the land is again broken up by the plough. Small farmers frequently do not sow any grass seeds nor mow the crop; they content themselves with a little hay, and allow the land to fallow for a year or two. Owing to the warmth and moisture of the climate, and from the later period (the month of August) at which they are cut, the crops of hay are heavier than would be produced by land of equal fertility, and are often gathered after a shorter interval. To meet the demand for English hay, the labourer has to work sometimes for six weeks in July and August, merely for his food, consisting generally of potatoes and milk. When a farmer feeds his cattle, he gives him commonly better food than he would have at home. If a labourer has a cottage, potato-garden, and milk from his employer, as is usual, these are considered equivalent to a third or a half of his wages. The labourers in the richest grazing districts are the worst off. The labourers who work on small holdings or at fixed wages, exhibit generally increased cleanliness and decency of appearance, and their cabins are better furnished.

There is no employment for women, except in some of the baronies in harvest-time, and perhaps in the potato-planting and digging seasons, when they earn about 6d. a day. Formerly they spun wool for their own clothes, but this practice has ceased for several years, probably because the market article cannot be sold cheaper. The rearing of fowls is the source of some profit; and a couple of pigs will bring in about 3l., which is depended upon to pay the rent of the potato-garden. There is no work for children under fourteen years of age; they are not employed in hoeing or weeding corn or other crops.

The cottier tenants, occupiers of less than ten acres of land, are enabled to feed and clothe their families better than the labourers, but are themselves some 2d. cheaper. The labourers who are dieted by the farmers. Cottiers seldom keep a cow; they hold their land from year to year, and are generally in arrear for rent, which is always (if a man holds five acres or more) expected to be paid in money.

The potatoes which the labourers or cottiers consume constitute the food of his family; he himself is frequently fed by his employer. Milk is not used in more than one half of the families. The greatest expenditure on tobacco is 6d. a week. Cottiers and labourers are entirely supplied with glass, and even when they get it in casting a funeral 5s.; at consecration at Easter and Christmas 1s. is expected: but these fees are often remitted

The dwellings of the labourers are of the most wretched description, nor has any perceptible improvement taken place of late years. During the alarm of cholera they were whitewashed, but that is now neglected. They are generally 20 feet long by 10 wide; walls of clay, divided into two or perhaps three very small apartments, and never having a second story; covered only with a thatch of straw, and having nothing but the bare ground for the floor, and that often full of holes, which in wet weather become little pools of water. A hole in the roof allows the escape of the smoke, and their windows, 15 inches square, are more commonly without glass than with it, and almost universally destitute of shutters. They have rarely any window boxes or flowers; and where they have not even that, the pig sleeps in the house. These wretched hovels usually cost in erection about 10l., and the tenant pays from 23l. to 30l. a year as rent; with a roof of land, the rent is near 25l. 10s. The cabins are always kept in repair by the tenant. They are usually built separate, not grouped in villages or hamlets, and for convenience near the road-side.

It rarely happens that there is more than one bed for the whole family; a bedstead, a dressers, a piping iron pot, and some crockery, all of the worst description, usually complete the catalogue. In some wretched cabins even these are not found, and the family lie on the floor.

The chief article of food is the potato; the peasants grow this in preference to any other, as an abundant supply with less care and less manure. A labourer, when employed, gets three meals of potatoes a day, his wife and children only two. In July and August, when the old potatoes have become unfit for food, and the
new crop is not ready, colic or other bowel complaints are produced by the unwholesomeness of the diet; and the failure of the potato crop is always productive of great distress: the labourer is then obliged to procure provisions upon credit, which he obtains with great difficulty and by paying above the market-price. In respect of clothing, considerable improvement has taken place; though the peasants are still very indifferently clad. No material for clothing is of home manufacture, chiefly cotton is made up on their own dresses; sometimes however they are unable to do this, and have to pay for getting them made. The use of shoes and stockings is increasing. Old clothes, brought from London and Liverpool, are much worn. The yearly expenditure of a labourer's family consists of this: 11d. in money and 1d. in kind for blue stocking wool; 3d. for a pair of old shoes; and 8d. for a pair of singer. The ordinary diet is turf; near the bogs this is cheap; but to one living at a distance of 8 or 10 miles from a turber, the cost is doubled. When fuel is scarce, pilfering and the destruction of woods and fences are common. Straw and dryd cow-dung are used as a substitute for turf. The county has always been one of the most disturbed in Ireland: although there is an ebb and flow of crime in other counties, Tipperary has always kept up steadily to high water mark. Never was the county placed under the police magistrate of Cashel. (See Parliamentary Papers for 1836, vol. xxxii, p. 357.)

**Divisions, Towns, &c.**—The county is divided into eleven baronies, as follows:

<table>
<thead>
<tr>
<th>Situation</th>
<th>Pop. in 1831</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clanwilliam</td>
<td>4,152</td>
</tr>
<tr>
<td>Eliogarty</td>
<td>38,531</td>
</tr>
<tr>
<td>and Clonmel (East)</td>
<td>36,702</td>
</tr>
<tr>
<td>and Clonmel (West)</td>
<td>8,142</td>
</tr>
<tr>
<td>Ikerin</td>
<td>N.E.</td>
</tr>
<tr>
<td>Killenahan</td>
<td>30,774</td>
</tr>
<tr>
<td>Middlesbrough</td>
<td>44,103</td>
</tr>
<tr>
<td>Ormond (Lower)</td>
<td>45,066</td>
</tr>
<tr>
<td>Ormond (Upper)</td>
<td>24,807</td>
</tr>
<tr>
<td>Owney and Arra</td>
<td>32,454</td>
</tr>
<tr>
<td>Sillevardagh</td>
<td>32,765</td>
</tr>
</tbody>
</table>

It contains the county-town of Clonmel or Clonmell [CLONMEL]; the city of Cashel [CASHEL]; the ex-borough (formerly parliamentary) of Fethard; the market-towns of Cahir, Carrick-on-Suir [CARRICK-ON-SUIR], Clogheen, Killenaule, Ninagh, Roscrea, Templemore, Thurles, and Tipperary; the post-towns of Burris-o’Leagh, Burris-o’Kane, Cloughjordan, Golden, Littleton, New Birmingham, and Newport; and the villages of Ballina, Emily, Mullinahone, Silvermines, Toomavara, and others. Some of these are of great extent, and appear to be merely a portion of the others we give some account here.

Fethard is in the barony of Middlesbrough. 100 miles from Dublin by Kirkenny and Callan, and 9 miles from North from Clonmel. The town contained, in 1831, 592 houses, inhabited by 699 families; 39 houses uninhabited, and 5 building; with a population of 3405: the whole parish contained 679 houses, inhabited by 791 families; 41 houses uninhabited; and 7 building; with a population of 4050. The town is irregularly laid out on both banks, but chiefly on the left or north-eastern bank of a small stream, the Glashagh, which ultimately joins the Suir below Clonmel. Fethard is an ancient and decayed town, in a bye situation, with little trade. Of the houses 120 are slated, and chief; of the two streets: the rest are thatched cabins, and of the poorest description. There are a parish church; a Presbyterian and a Primitive Methodist meeting-house; two Roman Catholic chapels, one the regular parish church, the other attached to an Aughushan Friary. The parish church, of which the chancel is in ruins, and the friary, chapel, are ancient structures. There is a good slated school-house. The town was formerly walled, and some portions of the walls and of the gateway towers remain. There are (or were lately) four mills and 21 yard and two: the principal trade is shoemaking; but the chief occupation of the labouring class is agriculture.

The town was incorporated at an early period: the old charters date from 1376, but the corporation has been dissolved by the late Irish Municipal Reform Act. The borough sent two members to the Irish parliament, but was disfranchised at the Union. There is a market on Saturday, but it is of minor importance: the yearly sale of wheat is about 8000 bushels, of oats about 3000 or 3500 barrels. There are a dispensary and a charitable loan-fund: and (by return to the Census of Commons, printed in 1835) ten schools of all kinds, including one national school with 22 masters, and an average daily attendance of 130.

Cahir, or Caher, is in the barony of Iffa and Ofis West, 111 miles south-west from Dublin by Clonmel, from which it is distant 7 miles west. The town had, in 1831, 358 houses; inhabited by 587 families; 43 houses uninhabited, and 3 building; with a population of 2817. The whole parish had 1925 houses, inhabited by 2953 families: 83 houses uninhabited, and 23 building, with a population of 1650. Cahir is pleasantly situated on the banks of the river Suir, and about midway between Cashel and the Knockmealdown Mountains: it is, for an inland town, very clean, and has been steadily increasing, though not rapidly: the new houses are chiefly of a good description, worth from 10l. to 40l. a year, and are unoccupied or tenanted. There are a parish church, a Roman Catholic chapel, and a Quakers’ meeting-house. Near the town are extensive cavalry barracks; and on the banks of the Suir are the demesne and residence of the Earl of Glencairn. As an attempt is being made to set the road on the right course of manufacture, but it failed: since then the straw-plait has been introduced, and gives employment to a number of females: there are also some extensive flour-mills. The market day is Thursday, and is an important corn-market: the yearly sales of wheat had increased from 22,000 in 1820, to 56,131 in 1835: the sale of oats had continued steady through the same period, at 37,000 barrels. There is a bridewell, and a body of constabulary are posted at the town: there are also a dispensary and a charitable loan-fund. By return to Parliament in 1835: fifteen schools of all kinds; one of them a national school, with 25 scholars (boys and girls) on the books, and an average attendance of 150; and two others on Emancipation’s foundation, one with 15 girls and 1 boy on the books, and an average attendance of 25; the other containing 11 boys. Near the town, as an island of the Suir, are the picturesque ruins of the castle of Cahir.

Clogheen is in the barony of Iffa and Ofis West, 129 miles south-west of Dublin through Clonmel, and 14 miles from Clonmel. The town is chiefly in the parish of Shanrignan: it contained, in 1831, 291 houses, inhabited by 357 families; 17 houses uninhabited, and 3 building; with a population of 1925: the whole parish had 396 houses, inhabited by 1395 families: 39 houses uninhabited, and 4 building: the parish of Tullaghurton, into which the town extends, had 297 houses, inhabited by 335 families; 5 houses uninhabited, and 5 building; with a population of 1996: the whole parish contained 357 houses, inhabited by 1236 families, and 28 houses uninhabited. We have no means of ascertaining there is a Roman Catholic chapel in the town: the parish church of Shanrighan is in the immediate neighbourhood. Tullaghurton is a village.

A large corn-market is held on Saturday, at which the yearly sale of wheat begins to be considerable; from 42,125 barrels in 1826, to 62,834 in 1835. But the total of barley had decreased from 3200 barrels in 1839, to 525 in 1835: there are seven flour-mills in and round the town. The flour from which is sent by land to Clonmel, and then thence down the Suir to Waterford, where it is shipped. There is also a large brewery. A body of constables are posted in the town; and there are a small cavalry barracks, a small police establishment, and a dispensary, erected for fever-hospitals. The town is the seat of an ancient abbey. Shanbally Castle, the seat of Lord Lismore, is also in the neighbourhood. As the returns to Parliament in 1835 there were in the two parishes eight private schools, but not any maintained or others supported by subscription or endowment.

Killenaule is in the barony of Sillevardagh, 92 miles south-west from Dublin by Urinford, and 16 north from Clonmel by Fethard. The town, in 1831, contained 55 houses, inhabited by 281 families, and 21 building; with a population of 1578: the rest of the parish had 279 houses, inhabited by 300 families; 9 houses uninhabited, and 3 building, with a population of 1906. There is a Roman Catholic chapel, and a large school, and a small and ancient. There is a weekly market, and several yearly fairs are held: a portion of the county constabulary is stationed in the town. Several of the cemeteries of
the Killenaule coal-field are in this parish. By the returns to parliament, A.D. 1835, there were in the parish six schools, all supported by the payments of the children; seven churches had been built by subscription for two of these schools.

Nenagh is partly in Upper Ormond, but chiefly in Lower Ormond barony, between 95 and 96 miles south-west of Dublin. Present church forms the chapel of the Romanesque cathedral of St. Augistine, 1391, 1282 houses, inhabited by 1703 families; 55 houses uninhabited, and 9 building, with a population of 8466; the remainder of the parish contained 104 houses, inhabited by 104 families, and 2 houses uninhabited, with a population of 263; making the total population of the town antiently belonged to the Butler family, who had a strong castle here; it had two ecclesiastical foundations; an hospital for the canons of St. Augistine, founded A.D. 1230; and a Franciscan convent, denominated the richest foundation of that order in Ireland, founded in the reign of Henry III. The town was burned, A.D. 1550, by his natives under O'Carrol, and the friary was included in the destruction, but the castle was saved by the garrison.

The town was repeatedly taken and retaken in the great civil war in the reign of Charles I. It was taken by the native forces of James II, A.D. 1688, but after a time abandoned and burned by them. The town stands on the river Nenagh, which flows with a circuitous course from the Keeling Mound to the town, where there are several streets meeting in the centre. The ruins of the castle, consisting chiefly of a large circular donjon or keep, called Nenagh Round, are on one side of one of the streets, just in front of a fine hospital and dispensary; a church, rebuilt some years since; a Roman Catholic chapel; and a bridalwell, unless it has been dissolved since the completion of the county gaol, aely erected here. Some remains of the Franciscan friary may be traced. A portion of the county constabulary and stationed here. There is a well-attended market on Thurs-

iday for corn and cattle. The number of barrels of wheat sold in the average of the years 1826 to 1835 was above 45,000, of barley 18,500, of oats 10,500 to 22,100 barrels; the yearly average of tons by 885, and of barrels by 2363; the wheat contains 664 barrels, inhabited by 885 families; 15 houses uninhabited, and 18 building; with a population of 4583. The town is pleasantly situated near the right or west bank of the Suir, and is (comparatively) a quiet and pleasant place, which has a handsome tower and spire, was rebuilt about fifty or sixty years ago; there are a handsome and spacious Roman Catholic chapel, a good market and court-house, a bridewell, extensive barracks, a fever hospital and dispensary, and hall and news-rooms. The town is approached on all sides by avenues of ash-trees; and there are several gentlemen's seats and the remains of some very antient castles in the neighbourhood. There were, according to the returns of 1835, seven schools in the parish, including a free-school on Erasmus Smith's foundation, with an average attendance of 47 scholars, boys and girls.

Thurles is in the barony of Eliogarty, 96 miles south-west from Dublin by Templemore, and 39 or 40 north of Clonmel. It is supposed to derive its name from the Knights Templars, who had a house here, of which the remains form an entrance to the demesne of the Carden family. There were in the town, in 1831, 404 houses inhabited by 609 families; 12 houses uninhabited and 7 building; the population in 1825 was 2363; the wheat contains 664 barrels, inhabited by 885 families; 15 houses uninhabited, and 18 building; with a population of 4583. The town is pleasantly situated near the right or west bank of the Suir, and is (comparatively) a quiet and pleasant place, which has a handsome tower and spire, was rebuilt about fifty or sixty years ago; there are a handsome and spacious Roman Catholic chapel, a good market and court-house, a bridewell, extensive barracks, a fever hospital and dispensary, and hall and news-rooms. The town is approached on all sides by avenues of ash-trees; and there are several gentlemen's seats and the remains of some very antient castles in the neighbourhood. There were, according to the returns of 1835, seven schools in the parish, including a free-school on Erasmus Smith's foundation, with an average attendance of 47 scholars, boys and girls.

The town is formed of several streets, irregularly laid out, and had, in 1831, 907 houses, inhabited by 1156 families; 61 houses uninhabited, and 6 houses building, with a population of 512. The whole parish, which extends into the baronies of Ballybritt and Clonlisk in King's County (Leinster), had 154 houses inhabited by 161 families; 2 houses uninhab-
much dilapidated; there is an extensive mansion, formerly belonging to the earls of Llandaff, now converted into a barracks. There are a neat market-square, a handsome Roman Catholic chapel, which is the cathedral of the Catholic archbishop of the diocese of Cashel and Emly, a Roman Catholic college, two nunneries, one of Ursulines, the other of the order of the Presentation, a Baptist meeting-house, a Roman Catholic parochial church, a Roman Catholic presbytery, a neat sessions-house, a well-arranged bridewell, and a dispensary. Considerable trade is carried on in the town: there are two market-days in the week, a monthly fair, and three yearly fairs; the sale of corn is considerable, and is usually carried on in the town; the market-tolls (which has increased from 30,400 barrels in 1826 to 50,600 in 1835) and that of barley from 9400 barrels in 1826 to 11,000 in 1835: that of oats had continued stationary at from 3000 to 4000 barrels. The building and repairing of the town are performed by the Parliamentary Returns of 1835, seventeen schools: including one of 300 girls, taught by the nuns of the Presentation convent; a boarding-school of 60 girls, and a day-school of 120 girls, kept by the nuns of the Ursuline convent; a day-school with an average attendance of 200 boys, under the direction of the Religious Brothers; and a day-school under the superintendence of the curate of the established church and some of the parishioners, with nearly 400 inhabitants.

Tipperary is in the barony of Clancamill, 110 miles south-west of Dublin, and 23 miles west north-west of Clonmel. A monastery for Eremites of the rule of St. Augustin was founded here in the reign of Henry III. In the reign of Henry VIII. (1529) the monastery was burnt by the insurgents under Brian O'Brien. Its former importance is indicated by its having given name to the county, and by the fact of its having been antiently incorporated; but it no longer possesses the same relative importance, and the corporation has long ceased to exist. The town is chiefly in the parish of Tipperary, but extends into those of Curdangan and Kilshane: it had, in 1831, 988 houses inhabited by 1294 families; 36 houses uninhabited and 18 burnt. The population of 617 inhabitants of Tipperary had 1113 houses, inhabited by 1379 families; 36 houses uninhabited, and 16 buildings; with a population of 7996.

The town of Tipperary stands near the little river Ern, which flows into the Suir, and consists of one principal street, from which smaller streets branch off at right angles. Several of the houses are well built, and of handsome appearance: many old buildings have been taken down and new ones erected in their place, so that the town has a neat and modern appearance. The inhabitants are supplied with water from a public fountain. The church is a modern structure, and there is a Roman Catholic chapel. There are some remains of the Augustinian monastery, chiefly consisting in the gateway in the building occupied by Erasmus Smith's classical school, which has obtained from this circumstance the popular designation of 'the abbey.' The principal trade is in butter, of which a large quantity is sent to Limerick and to Waterford for exportation. There are two weekly markets (for which there are a neat market-house with a news-room over it, in the centre of the town, and shambles: and four yearly fairs. The sale of wheat is small: but it had increased in the ten years from 1826 to 1835, from 1225 to 3160 barrels, that of oats had increased from 7798 to 10,075 barrels: but the sale of barley had declined from 610 to 236 barrels. There are a dispensary, a fever hospital, a temporary barracks, and a small bridewell: a portion of the county constabulary are stationed here. There were in Tipperary parish, according to the return made to parliament in 1835, nineteen schools of all kinds, including a classical boarding-school on Erasmus Smith's foundation (the Abbey School), with 28 scholars: another school on the same foundation with about 34 children, boys and girls, and national schools for boys and girls, attended each by about 110 scholars. Kilshane parish had no school, and Cuidangan only one, a hedge-school, with 24 scholars in 1831.

Burris-o-Leagh, or Burrisallagh, is in the parish of Glenkeen, in the barony of Kilinamaghan, 92 miles south-west of Dublin. It had, in 1831, 219 houses, inhabited by 260 families, 14 houses uninhabited and 4 buildings, with a population of 1304. The parish church and the Roman Catholic chapel are both in the town. There is a small brewery: three yearly fairs are held, one of them a considerable fair for pigs. A body of the county constabulary is stationed here. The returns (Part. Returns, 1835) in the whole parish are: nine schools, including three national schools, with an average attendance of from 210 to 220 children: and an school with 23 children, partly supported by private subscriptions.

Burris-o-Kane, or Burris-o-Kean, or Burros-o-Kean, is in the barony of Lower Ormond, 91 miles west-south-west of Dublin. The town had, in 1831, 266 houses inhabited by 7708 persons, 7708 a population of 1185: the whole parish had 4000 inhabitants by 477 families, 24 houses uninhabited, and 1 building; with a population of 2934. The town was much improved of late years; many new houses have been built, and there are a Roman Catholic chapel and a national school, besides the parish church, a plain mansion building; a dispensary and fever hospital, and a poor-house. There are some remains of a square castle of stone, construction, called Tumblantine. Four fairs are held in the year. There were in the parish, by the returns of six schools, including three free-schools, one with about 10 children, connected with the Baptist Irish Society, and other with 30 boys, in connection with the Society for the Propagation of the Gospel in Foreign Parts. There are a considerable distillery. Three yearly fairs are held. A society for the relief and diminution of pauperism, called 'the deacon's poor fund,' exists in the and the adjacent parishes. There were no schools in the town and district: but in the whole parish of Moderny there were five day-schools, including two parochial schools, one with about 50 boys and children, others with about 60 girls: there were also Sunday schools for religious instruction.

Golden is in the parish of Relickmurry, or Reliénmum, in the barony of Clancamill, about 102 miles S.W. of Dublin, between Cashel and Tipperary. There were, in 1831, the town, 101 houses inhabited by 105 families, 2 houses uninhabited, and 5 buildings; with a population of 770. It is on the Roman Catholic road to Golden Vale, one of the most fertile districts of the county, and is divided into two parts by the river Suir, over which is a stone bridge. It has the ruins of an old castle, and in the new town, the Abbey, originally one of the most splendid ecclesiastical structures in the kingdom, the ruins are extensive and worthy of notice. The parish church and a Roman Catholic chapel are in the town. There are four schools and four fairs are held yearly. A body of the county constabulary are parish. The United parishes of Relickmurry and Alaban, in 1835, six day-schools; one, with 60 children, supported by Lady Elizabeth Mathew.

Littelton is in the parish of Borrisleigh, in the barony of Eliogarty, 90 miles S.W. of Dublin. It contained, in 1831, 44 houses inhabited by 54 families, 3 houses uninhabited and 1 building; with a population of 293. It is a part of the county constabulary, and was, in the time of the last Lord Thomas Grady. The parish church, a handsome building, is in the town; and there is also a dispensary, a body of the county constabulary are stationed here. There were, in 1835, five day-schools, of which one was a Roman Catholic, and 31 children were taught; the others were others were in a school-room erected by subscription.

New Birmingham is in Kilcooley parish, in the barony of Silievardagh, 95 miles S.W. of Dublin. This town was on its original site, late Sir Vere's. It was annexed for two weekly markets and twelve yearly fairs which have been discontinued, and the place is comparatively deserted. There are a Roman Catholic chapel and a dispensary. There were, in 1831, 48 houses inhabited by 120 families, and 1 house uninhabited; with a population of 286.
Newport is in Kilvolane, or Killvolane, parish, in the barony of Oney and Arra, 109 miles S.W. of Dublin, on the road to Limerick. It had, in 1831, 127 houses inhabited by 162 families, 24 houses uninhabited, and 12 buildings; with a population of 692. The houses are for the most part, large; and the greatest part of the parish church is in the town; and there are a Roman Catholic chapel, a dispensary, and infantry barracks. There are four yearly fairs, one of them a cattle-fair.

Kilfinny is in Templeleigh, Temple kali, or Temple-kelly parish, in the barony of Oney and Arra, on the bank of the Shannon, near where it leaves Lough Derg, opposite Killaloe. This village is connected with Killaloe, to which it may be considered as a suburb, by a bridge of stone. The town was incorporated, and the parish church is in the village, in 1831, was 632. There is a Roman Catholic chapel; and a body of the county constabulary are posted here. There is a yearly fair for pigs. Near the bridge are the remains of a castle erected to defend the passage of the river.

Emly is in the barony of Clanwilliam, near the western border of the county, about 9 miles west of Tipperary. It is of great antiquity. An abbey of regular canons of St. Augustin was established here, and subsequently became the seat of a bishop's see. Some of the prelates appear to have exercised temporal power as well as spiritual; and one of them in particular, in the ninth century, distinguished himself as a warrior upon different occasions. The privilege of holding markets and fairs; but the privilege of a market, if ever used, is now disused. The diocese was united to that of Cashel a.d. 1568, and the removal of its see was deemed the most convenient place. It had, in 1831, a population of 701. A body of the county constabulary are posted here; and there are two yearly fairs. The parish church is in the village, and there is a Roman Catholic chapel. There are the ruins of a church near the village of Roscrea. Some antiquities have been dug up in the neighbourhood.

Mullinalough is in Kilvolmen parish, in the barony of slevardagh, on the road between Callan and Fethard; it is also between Carrick-on-Suir and the Killenaule barony, so that it is a common resting-place for the car-drivers in their way from Carrick. A considerable quantity of butter is sold here in a weekly market (though the place ranks only as a village), held on Thursday, and sent to Killkenny, Clonmel, or Carrick. There is a bridge over the Suir. The country is a classical one; there are pigs, and a body of the county constabulary are posted here. There are a Roman Catholic chapel and a dispensary. The population of the village, in 1831, was 172.

Silvermines is in the parish of Kilmore and the barony of Upper Ormond, about 5 or 6 miles south of Newganny. It is at the foot of the north-western slope of the central hills, and takes its name from the lead-mines for which it was prospected, and yielded an unusual quantity of silver. The population, in 1831, was 791. Some of the houses are neatly built; the parish church and a Roman Catholic chapel are in the village, and there is a dispensary. There are four yearly fairs.

Toomavara, or Toomavanna, is in the parish of Aghanaideel, in the barony of Upper Ormond, between Nenagh and Burris-o-Leagh; it had, in 1831, a population of 790: here are a Roman Catholic chapel, a national school, and a dispensary in the village. There are at least two yearly fairs, and a body of the county constabulary are posted here.

Divisions for Ecclesiastical and Legal Purposes.—This county was formed at what is commonly deemed to be the first establishment of counties in Ireland, by King John, A.D. 1210; though Sir James Ware has shown that counties or some equivalent divisions must have existed before that time. The county was subsequently enlarged by the annexation of what was called Cross-Tipperary, a tract of land lying between the parishes of Coole and Mounthawk, and now forming the northern part of the county. Antient records speak of the 'Vice-Comes Croceae Tipperary.' It contains the whole or part of a hundred and sixty-three parishes. (Pop. Returns for 1831.)

<table>
<thead>
<tr>
<th>Diocese</th>
<th>Total Number of Parishes</th>
<th>Total Number of Rural and Urban Benefices</th>
<th>Perennial</th>
<th>Impariment</th>
<th>Population of Curates</th>
<th>Curates</th>
<th>Cure of Souls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cashel</td>
<td>40</td>
<td>39</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emly</td>
<td>9</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Killaloe</td>
<td>28</td>
<td>24</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lismore</td>
<td>22</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meath</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Total | 109 | 91 | 5 | 7 | 6 |

Cashel was an archbishopric, having in its province the united dioceses of Cashel and Emly, the diocese of Cloyne, the united dioceses of Cork and Ross, of Killaloe and Killfenor, of Limerick, Ardfelt and Aghadoe (which latter two were incorporated, and of Waterford and Lismore. By the Act 3 and 4 William IV, c. 37, a further union of the dioceses of Cashel and Emly with Waterford and Lismore was enacted, to take place on the next avoid ance; and this union has now been effected. The greater part of the county is in this united diocese. The same Act deprived Cashel of its archiepiscopal rank, on the decease of the then existing holder of the see, and added the province to that of Dublin: this change has been effected. The only part of the county in the diocese of Meath is the parish of Eglinton, which is partly in this county and partly in King's County, and is comprehended in the ecclesiastical union of Fircal. The diocese of Meath is in the ecclesiastical province of Armagh; but with the exception of the dioceses of the Dunes, Kilvolane, Kilfinny, and Limerick, in which of these counties the island is included we have no means of ascertaining exactly how many; but the greater part, if not the whole, is included in those of Cashel and Emly, Killaloe, and Waterford and Lismore.

The county is included in the Leinster circuit; the assizes are held at Clonmell: the county-gaols are at Clonmell and Nenagh, the latter very lately erected; and there are bridewells at Cahir, Cloughen, Tipperary, Cashel, New Birmingham, Thurles, Templemore, Roscrea, Nenagh (we are not sure if this is continued since the completion of the county-gaol), Burris-o-Kane, Newport, and Carrick-on-Suir. The county barracks, at Cloughen, or Cloughen or Carrick-on-Suir; a gaol, house of correction, and sheriff's-prison: the house of correction is under very good management; the silent system of prison discipline is acted upon, the prison not being adapted for the introduction of the separate system. Considerable improvements had been made in the sheriff's-prison according to the 'Nineteenth Report of the Prison Inspectors' (1841), the last we have seen; but a complete system of discipline could not be introduced until the removal of part of the prisoners to Nenagh gaol, which was not then completed. The bridewells are many of them in a bad state; those of Cahir, Cashel, and Templemore are miserably dilapidated, and that at Cahir very badly managed; those of New Birmingham, Burris-o-Kane, and Tipperary, insecure and ineffectual; Carrick bridewell, though new, is badly finished and ill-managed by the keeper; and that at Cloughen, though in tolerable good order, falls very far short of the well-regulated bridewells of other counties. Those of Newport, of Nenagh, and Thurles (the last a large prison) are in good order. (Inspectors' Report, 1841.) It is stated in a note to that Report, that great improvement has been made in several of these prisons since the inspectors' visit.

The number of criminal offenders committed for trial in 1839 was 2110, being greater than in any county of Ireland, except the metropolitan county (including the city of Dublin); and more than twice as great as in any other Cork, except that of Cork (including the town of Cork); Galway (including the town of Galway); Limerick (including the city of Limerick), and Kerry; and of these the only one which approached it was Cork (323 committals), which had more than twice the population; the rest barely exceeded half. The number of prisoners in a Galway rather exceeds it in population; Limerick has about three-fourths of the population of Tipperary, and Kerry nearly two-thirds. So far therefore as the number
of commital is a test of the state of crime, Tipperary that year exceeded all other counties in Ireland, except that of Dublin, and in most cases very far exceeded them. Of the 2110 persons committed, 948 were convicted, and 1164 acquitted or discharged; 9 of the convictions were for public order offences and 4 of the criminals were executed. In 1840 the number of commitals was 1642, the county still retaining, or nearly so, its unhappy pre-emience: of the persons committed, 718 were convicted, and 924 acquitted or discharged; of the convictions were for capital offences, but no persons were executed. A large proportion of the offences were murders, manslaughters, assaults, riots, and other violent offences, indicative of the prevalent tendency to disturbance and insubordination.

The county returns two members to parliament, who are elected at Clonmel; and one member each is returned from the borough of Clonmel and the city of Cashel. The number of registered electors for the county in February of each of the years 1835, 1837, and 1841, was as follows:—

<table>
<thead>
<tr>
<th>Year</th>
<th>Holders of Freeholders</th>
<th>Holders of Freemen. Total</th>
<th>Leases of freeholders</th>
<th>Leases of freemen. Total</th>
<th>charge. Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1835</td>
<td>660</td>
<td>361</td>
<td>2</td>
<td>145</td>
<td>21</td>
</tr>
<tr>
<td>1837</td>
<td>854</td>
<td>437</td>
<td>15</td>
<td>1773</td>
<td>35</td>
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<tr>
<td>1841</td>
<td>792</td>
<td>316</td>
<td>13</td>
<td>1217</td>
<td>10</td>
</tr>
</tbody>
</table>

The number of voters in Clonmel and Cashel, in the same years, was as follows:—

**Clonmel.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Holders of freeholders. Holders of freemen. Total</th>
<th>Freemen. Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1835</td>
<td>601</td>
<td></td>
</tr>
<tr>
<td>1837</td>
<td>699</td>
<td></td>
</tr>
<tr>
<td>1841</td>
<td>587</td>
<td></td>
</tr>
</tbody>
</table>

Before the Union the county returned eight members to the Irish parliament, namely, two for the county itself, and two each for Clonmel, Cashel, and Fethard, but the last was disfranchised at the Union, and Cashel and Clonmel reduced to one member each: no change in the number of members was made by the Reform Act.

The amount of grand jury presentations for the years 1839 and 1840 was as follows:—

<table>
<thead>
<tr>
<th>Year</th>
<th>New roads, bridges, &amp;c.</th>
<th>Repairs of roads, &amp;c.</th>
<th>Court and Sessions houses, erection and repairs of gaols, bridewells, &amp;c.</th>
<th>County gaol and bridewell, and prison expenses</th>
<th>Salaries to officers in gaols and penitentiaries</th>
<th>Reimbursements to county officers, collectors, &amp;c.</th>
<th>Reparations to government</th>
<th>Miscellaneous</th>
<th>Total</th>
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<tbody>
<tr>
<td>1839</td>
<td>£2,219 13 5</td>
<td>£3,165 13 0</td>
<td>£960 0 6 930</td>
<td>5,074 3 3</td>
<td>6,046 17 1</td>
<td>4,000 1 10</td>
<td>1,959 1 11</td>
<td>£2,834 17 3</td>
<td>£67,577 3 10</td>
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<tr>
<td>1840</td>
<td>1840</td>
<td>1840</td>
<td>1840</td>
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<td>1840</td>
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The county constabulary on the 1st January, 1840, and 1841, consisted of the following:—

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<tr>
<th>County</th>
<th>Sub-Hand</th>
<th>Sub-Inspectors</th>
<th>Inspectors</th>
<th>Constables</th>
<th>Constables</th>
<th>Houses at cash</th>
<th>Rate.</th>
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<tr>
<td>1840</td>
<td>2</td>
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<td>4</td>
<td>5</td>
<td>2</td>
<td>15</td>
<td>109</td>
<td>481</td>
<td>170</td>
<td>170</td>
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<td>170</td>
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<td>1841</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>14</td>
<td>122</td>
<td>531</td>
<td>79</td>
<td>79</td>
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</table>

The whole expenditure on the constabulary force in the year 1839 was £36,376 9s. 1½d., and in 1840, £36,595 15s. 10d.

The amount of the constabulary force and the cost of maintaining it are greater than in any other county in Ireland.

There is a county lunatic asylum at Clonmel; which in the year from March, 1840, to March, 1841, contained 94 patients, and was maintained at an expense of £2227 3s. 3d., or 25s. 6d. per each patient. There is a county in-
plied successively by Mahon and his brother Brian Boromh, or Bor-umhe, or Born, two princes of the Dalcaisian family, the ater of whom acquired the monarchy of Ireland. At the commencement of the twelfth century, Murchad Murtaracht, king of Munster, gave over the city of Cashel to the church, dedicating it to God and St. Patrick. The holders of the see of Cashel had previously assumed the rank of archbishops.

The submission of the English to the authority of the church, which followed Henry II. (A.D. 1172) summoned an assembly of the Irish prelates and princes at Cashel, where the sovereignty of the English king was recognised, and various regulations made, increasing the power of the clergy, and more completely assimilating the practices of the English church. This independence of the Irish church, or papacy, or part of it at least, seems to have remained under the dominion of Donald of the sept of O'Brien, native prince of Thomond and Ormond, subject to the nominal sovereignty of the English king. In the irregular warfare which followed Henry's departure from Ireland, a body of Anglo-Normans under Richard, earl of Striguil, summoned Strongbow, and governor or commander in Ireland, and of Hervey of Mount-Morris, entered the county (A.D. 1174) to attack Donald O'Brien, and advanced as far as Cashel, where they were to be joined either by a department from the Anglo-Norman garrison of Dublin or by a body of Oif-men from that city: but this detachment was sur-

prise near Thurles by Donald, a detachment of his army, without resistance; and Strongbow and Hervey retreated to Waterford. The invaders appear to have crossed the county again the same year, in their march to Limerick (which was also under the dominion of Donald), which the advent of his army, the approach of the able Anglo-Norman force with a body of native allies entered the county under Raymond Le Gros, marching to the relief of Limerick, to which Donald O'Brien had laid siege. The forces of their approach, advanced, and entrenched themselves in a defile near Cashel, where they were defeated with great slaughter: the garrison of Lime-

rick was relieved, and on the banks of the Shannon or of Lough Derg near Killaloe, the victorious Raymond received the submission of Donald and his septs, and the submission of O'Connor, titular king of Ireland; and exacted hostages from both for the faithful performance of the engagements into which they entered.

This county was probably included in the grant of the principality of Thomond to Philip de Braon (A.D. 1177), but the prudence or the cowardice of that noble prevented his dispossessing Donald O'Brien, who still retained possession. In A.D. 1185, while prince (afterwards king) John was engaged in the destruction of his ances
tor, his dominions in Ireland, the Anglo-Normans erected castles at Tipperary and Ardfinnan in this county; that of Ardfinnan was how-

ever soon taken by Donald, who, in A.D. 1190, defeated the Anglo-Normans under William, earl-marshal (who had made his way to England, but returned with the estates of that nobleman) near Thurlis. Donald died A.D. 1194. The oldest part of the present cathedral of Cashel was built by him. Tipperary appears to have passed in the course of a few years afterwards into the hands of the Anglo-Normans, as it was one of the counties erected by King John (A.D. 1210), during his expedition to Ireland, at the head of a considerable army. It is probable that the northern part at least of the county was part of the seat of (A.D. 1245-1249) between which and a portion of Thomond, and the Anglo-Norman, or as we may now term them, Anglo-Irish family of the De Clare.

It is probable that the Scots and their Irish allies were in this county (A.D. 1317) in the invasion of Ireland by Edward Bruce and his brother King Robert, since they ravaged the country from Kilkenny as far as Limerick. In A.D. 1328 the royal privileges in the county were granted to James Butler, earl of Carrick, near which place the customs of the time were retained by the earls of Ormond. In A.D. 1330 Brian O'Brien, prince of Thomond, ravaged the county and burned the village of Athassel (near Cashel) and Tipperary to the ground. In the period of anarchy which was contemporaneous with the middle of the thirteenth century in England, and continued long after that war was closed, the county was included in the scene of the frequent contests between the rival septs or families of the Geraldines, to which belonged the earls of Desmond and Kildare, and of the Butlers, at the head of which was the earl of Ormond. The burning of the cathedral of Cashel was one of the charges brought against the Earl of Kildare in his examination before the privy council (A.D. 1549-1560). His reply was characteristic: 'Spare your evidence,' said he; 'I did burn the church: for I thought the bishop had been in it.'

In the great war in 1642, Connell, Cashel, Carrick-

on-Suir, Fethard, and all the other towns in Tipperary, were fortified, and provision was made by the parliament for the royalist forces, under the command of a governor and officers, the archbishops, at Cashel; and the pela
gonians, at the latter place, made a passage at the city of Cashel, where they mercilessly slaughtered twenty priests and an unresisting multitude who had taken shelter in the cathedral. He levied contributions in all the neighbour-
hood, and was prevented from taking Connell only by want of provisions. When Cromwell invaded Ireland, and (A.D. 1649) was opposed by the Royalists and Confederates,

now united under the Earl of Ormond (to whom Lord Inghinquin, shocked at the execution of the king, had joined himself), he crossed the Shannon into Thomond, where Cromwell himself crossed the river to besiege Waterford. A body of Royalists under Lords Inghinquin, and Taaffe, attempting to retake Carrick (24th October), was repulsed with severe loss. Ormond with the main army left the country at this time, leaving Cromwell, whom sickness and the approach of winter obliged to raise the siege of Waterford; soon after which Ormond withdrew to Kilkenny, having posted a consider-
able body of Ulster men to Connell.

About the latter end of February, 1650, Cromwell opened the campaign by taking Cahir, Cashel, Fethard, Ologheen, and other places in this or the adjacent counties; and in the course of the following April laid siege to Clon-

mell, but without success. Within two months, he rushed Carrick-on-Suir (February 24th), Cromwell, with whom he was more immediately connected than with any other part of his Irish expedition: he lost above 2000 men in a fruitless assault; however after a siege of two months, the place was obliged to surrender for want of ammuni-
tion: the garrison had previously withdrawn to Waterford without Cromwell's knowledge, and the townsman obtained good conditions, Cromwell supposing that the garrison, was still in the town. In 1651 Iretson, who was after Crom-

well's departure, general-in-chief for the parliament, con-

quered the town, and marched to the bank of the Shannon, over which he forced a passage. On the restoration of royalty in Ireland, which rather pre
ceded its restoration in England, Connell was one of the towns occupied by the Royalists.

In the war of 1689, Fethard was taken by the Jacobites on William's advance towards the south, after the battle of the Boyne (A.D. 1690). William, after his unsuccessful siege of Limerick, retired with his army to Connell, and then leaving them, proceeded to Dungannon, and embarked for England.

In the rebellion of 1798 this county was not involved; and though it has been the scene of much agrarian disturb-
ance, there has been no serious outbreak to require particu-
lar record.

(Map of Ireland, by the Society for the Diffusion of Useless Knowledge; Second Report of the Irish Railway Commissioners; Geological Transactions; Lewis's and Carlisle's Topographical Dictionaries of Ireland; The Trav-
eler's New Guide through Ireland; The Scientific Tourist in Ireland; Parliamentary Papers; Ware's History and Antiquities of Ireland; Cox's Hibernia Anglicana; Moore's History of Ireland; Gordon's History of Ireland; D. W. & Co.'s Topographical Views of Ireland; &c.)

TIPPOO SAIB, sultan of Mysore, was born in the year 1749. His father Hyder Aly Khan [Hyder Aliv], sensible of the disadvantages under which he himself laboured from want of education, procured for his son the best master-

ship which all the science of the Rosische, or Russian, medics. But Tipoo, although he had acquired a taste for reading, did not make any considerable progress, and he preferred martial exercises, into which he was initiated at an early age. The French officers in the employment of his father instructed him in tactics; and in 1767, when
Hyder Ali overran the Carnatic, Tippoo was entrusted with the command of a corps of cavalry. He was at that time nineteen years of age; but the success which he achieved in the neighbourhood of Madras sufficiently proved how much he had profited by his European teachers. During the war with the Mahrattas, which lasted from 1775 to 1779, Tippoo acquired the universal esteem of the army; and when the news of his father's death reached his counsellors, that the left division of the Mysore army, consisting of 18,000 cavalry and 6000 regular infantry, was put under his command. With this force Tippoo attacked Colonel Bailey in the neighbourhood of Perambukam, on the 1st of November, 1782. He crossed the Cauvery, and on the 10th of the same month an engagement, in which Tippoo Saib is said to have taken an active part, ended in the entire defeat of the English army. The whole of the war in the Carnatic gave him opportunities of perfecting himself in the art of war; and on the 18th of February, 1782, he showed his skill in the attack and complete defeat of Colonel Bralthwaite, on the banks of the Kolerum. This was undoubtedly his greatest stroke of generality. A few months afterwards he was obliged to move towards the south, in order to meet the English troops in the provinces of Tanjore and Malwa, under the command of Colonel Humbertson. On the 20th of November Tippoo found the English at Paniani. He made a vigorous attack, but was barely able to repel it. He crossed the river Paniani, and prepared himself for another engagement, when, on the 11th of December, 1782, he received intelligence of the death of his father. On the 20th he was at Seringapatam, where he immediately opened to our forces a regular display or ceremony. He had scarcely performed the funeral rites of his father when he returned to Arcot, and assumed the command of his army. But whilst he was engaged in the Carnatic General Matthews took Oonore, and the country of Bednore was in the hands of the English. In order to regain these more valuable possessions, Tippoo was obliged to relinquish his conquest in the Carnatic, and by the end of March, 1783, scarce a Mysorean was left in that country. His operations were so rapid and energetic that the death of his father did not in April Tippoo Saib had already reduced the garrison of Bednore to the necessity of capitulating. General Matthews and several of the principal officers were barbarously put to death. After the reduction of this city, it was Tippoo's object to repose himself of Mangalore, the principal seaport in his dominions. But the place was well defended; and in the midst of his preparations for the assault accounts were received in the camp of peace having been concluded between the two powers. It was in the month of July, when M. de Bussy, in consequence of this news, declined to act any longer against the English. He quitted the camp with his detachment. A considerable reinforcement having arrived under General Macleod, Tippoo agreed to a capitulation on the 1st of August. On the 24th of August, Staunton and two other ambassadors from Madras arrived in the camp, and on the 11th of March a treaty of peace, which stipulated for the liberation of all the prisoners and the restitution of all places taken by either party during the war, was concluded. About the end of the same year Tippoo concluded a treaty of peace with the court of Poona. He then returned to Seringapatam, and assumed the title of Sultan, thereby throwing off all dependence on or allegiance to the captive Raja (imprisoned by his father) or the Great Mogul.

In 1786 he occupied himself with internal regulations; and from an inventory made at this period we find that the treasure, jewels, and other valuable articles were estimated at 120,000 rupees sterling. He also possessed 6000 camels, 11,000 horses, 400,000 bullocks and cows, 100,000 buffaloes, 600,000 sheep, 300,000 firelocks, 300,000 matchlocks, 200,000 swords, and 2000 pieces of cannon, and an innumerable quantity of powder and other military stores. His regular army consisted of 19,000 cavalry, 10,000 artillery, and 70,000 infantry. He had also 5000 rocket-men, and 40,000 irregular infantry.

During the years 1787 and 1788 the attention of the Sultan was engrossed by the depredations made in the province of the Nizams, or chiefs of Malabar. He is said to have carried away from that province 70,000 Christians, and to have made Musalmans of 100,000 Hindus. This he effected by forcible circumcision, and compelling them to eat beef.

It was about this time that he published an edict for the destruction of all the Hindu temples in his dominions, and even of the doors of any house which contained an image of the Nizams, or chiefs of Malabar. He was so importunate in this situation that he succeeded in persuading the unfortunate his officers did not enforce this barbarous regulation.

Although Tippoo Sultan did not show any overt hostility toward the English after he had signed the treaty of 1784, yet in 1787 he made a sudden and mysterious appearance into a defensive and offensive alliance, and to encourage the court of Versailles to a speedy renewal of hostilities with England. The ambassadors returned to Seringapatam in the month of May, 1789, and were instantly received by Tippoo Sultan, who tendered his hostages, by putting two of them to death as having betrayed his interests. Tippoo hated the British power in India, and he took every opportunity to annoy such of the native kings as were under its protection. The Raja of Travancore had by the treaty of Mangalore stipulated for the security of his territories. In April, 1790, Tippoo invaded the country and subjected the whole of the northern district. The reasons assigned by Tippoo for the infracting of the terms of the treaty were that he desired two forts, Cunnugumere and Jyacotta, which were on the northern boundaries of the Raja's possessions, had belonged to his father. The aggression was considered by the English equivalent to a declaration of war, and Colonel Hartley was ordered to return to Travancore, and to return to Seringapatam, when, to his dismay, he heard that the Maharrats and the Nizam had promised the English the recovery of some musnad more easily than that of the Travancore territories to lay waste those of his enemy. This he did with considerable ability; for in the beginning of 1791 the English, instead of being masters of great part of Mysore, as they had expected, found themselves attacked and annoyed in the very neighbourhood of Madras.

On the 29th of January, 1791, Lord Cornwallis assumed the command of the army, and on the 11th of the same month he was at Veilore. On the 21st of March the English army advanced towards the territory of the Nizam, and after a series of engagements returned to Veilore. In the beginning of April Lord Cornwallis assumed the command of the army and returned to Veilore, where he was joined by two detachments, under Colonel Stuart, captured Dindigul and Palagauthery. The operations and movements of the English forces were so well conducted, that Tippoo found himself unable to oppose them, and he resolved to follow the plan of war adopted by his father. He had adopted the plan of detaching one of his forces from the territory of the Nizam to lay waste those of his enemy. This he did with considerable ability; for in the beginning of 1791 the English, instead of being masters of great part of Mysore, as they had expected, found themselves attacked and annoyed in the very neighbourhood of Madras.

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However, whilst the English were carrying on their successful operations in the north-west part of Mysore, the Sultan made a diversion towards Coimbatore, situated to the south of Seringapatam; and Lieutenant Colonels Warburton and the whole of his party, were made prisoners. The skill of Tippoo Sultan enabled him to conduct the war to the month of February, 1792, when the allies the English, the Mahrattas, and the troops of the Nizam encamped on the borders of the Carnatic and continued their marches. After their return to Seringapatam, and had determined to take the town by storm, that the defeat of the Sultan was humbled. He agreed to the demands of the allies and, to pay them in the course of twelve months the sum of 3,300,000 rupees; and to restore all the presents, and to deliver up as hostages two of his sons. Abul- khelik and Mozar Addeen were the names of the two sons, and he consented to the disbandment of the army and the expatriation of the friendship of the Sultan. By the terms of the definitive treaty of the 16th March, 1792, the Sultan lost one half of his dominions. Soon after this the allies quarrelled with the neighbourhood of Seringapatam, and Tippoo sought...
The means of replenishing his treasury. This was soon done by imposing extraordinary taxes, which were very oppressive.

Notwithstanding this seeming tranquillity from 1792 to 1796, the Sultan was engaged in inciting all the native chiefs against the British power in India; but it was not until 1798 that the whole extent of his secret machinations was known. At the commence-ment of this year ambassad0urs were sent from Seringapatam to the Mauritius. Their object was to renew the sultan's relations with France, and to solicit the aid of 10,000 European and 30,000 negro troops. The proced-ures were many; they were forced towards the west side of the town. At the commence-ment of this year ambassad0urs were sent from Seringapatam to the Mauritius. Their object was to renew the sultan's relations with France, and to solicit the aid of 10,000 European and 30,000 negro troops. The proced-ures were many; they were forced towards the west side of the town.

About the same time intelligence was received in India of the operations in the French in Egypt. Circumstances now led to an attempt to proceed with the plan laid for some time before. The troops fled; he endeavoured to rally them; and so long as any of his men remained firm, he continued to dispute the ground against an English column which was now brought up by the British fleet, and finding all his efforts against the enemy fruitless, he mounted his horse, and, in endeavouring to effect his retreat, arrived at a bridge leading to the inner fort; but he was immediately occupied by the English, and it was attempted to prevent him from passing by a party of Europeans from behind the gate, by whom he was at-acked. Owing to two wounds which he received in his breast, he fell from his horse; his attendants placed him on the back of a camel, and hastened him through the town. On the afternoon of the 5th of May he was buried in the mausoleum of Hyder Ali. Four companies of Euro- peans attended the funeral procession, which was tri-angly solemn.

When Tippoo met his death he was in his fiftieth year. He was of dark complexion, and about five feet nine inches in height, and divided into three parts: a head, and an aquiline nose, which gave much animation and ex-pression to his countenance. Although after his misforunes in 1792 he oppressed the people more than they had ever been in the time of his father, he was nevertheless very popular; and even now the Mysoreans consider him a martyr to the faith, and as a prince who fell gloriously in the cause of his religion. He used to pass a great por- tion of his day in reading, and his library, consisting of about 120,000 volumes, was well selected. About one-half of this collection is preserved at the East India House, London; the other half was left at Fort William for the use of the college. The Museum and the Library of the East India House contain many articles both of value and rarity which once belonged to Tippoo Sultan.

"Memoirs of Tippoo Sultan," in Stewart's Descriptive Catalogue of the Oriental Library of the late Tippoo Sultan of Mysore, Cambridge, 1809. This is the most au-thentic account of Tippoo's life.

TIPTON. [Stewart, pp. 390-391.

TIRABOSCHI, GIROLAMO, born at Bergamo in 1731, studied in the college of Monza, and afterwards entered the order of the Jesuits. About 1768 he was made pro-nosticate, the place of Father Granelli, deceased. He now applied himself to the undertaking of his great work, "Storia della Letteratura Italiana," published at Modena, 1772-1783, which he completed in eleven years. The subject was vast and intricate; the author who has written a great his- tory of the Italian literature, Gimmia of Naples, had only sketched a rough and very defective out-line of it in his "Storia dell' Italia Lettera." There were however local histories and biographies concerning partic-ular towns and districts, the results of which it was sought to be sought among the archives and libraries of Italy.

Tiraboschi undertook to write the history of the literature of ancient and modern Italy in the most extended sense of the word, including most of, if not all, the literature deserving of memory in every department of learning, who have flourished in Italy, from the oldest times on record, beginning from the Etruscans and the Greek colo-nies of Magna Graecia and Sicily, and then proceeding with the history of Roman literature through its rise, progress, and decay, down to the invasion of the northern tribes, with which the second volume concludes. The author distri-butes the great divisions of learning in separate chapters; poetry, grammar, oratory, history, philosophy, medicine, jurisprudence, and the arts; he gives an account of the principal libraries, and of the great patrons of learning, and although he does not profess to write biography, properly speaking, yet he gives biographical notices of the more ill-forned and historic productions. This volume comprises the literary history of Italy during the dark ages, as they are commonly called, from the fifth to the twelfth century. The author makes his way through the scanty and obscure records of those times, and brings to light many materials which had been hitherto left unnoted. This volume embraces the 14th century, the age of Dante, Petrarcha, and Boccaccio. The author is particularly diffusive in speaking of Petrarcha. The sixth volume concerns the 15th century, an age of classical studies; the age of Cosmo and Lorenzo de' Medici, of Poggio, Filelfo, Niccolò, Palla Strozzi, Coluccio Salutati, Paolo Manetti, Cardinal Bessarion, and other collectors of MSS., founders of libraries, and encouragers of learning and literature, and the sect of jurists and ecclesiastical writers. This volume is very large and is divided into three parts, whilst the preceding volumes are divided each into two parts, each part being disposed in a chapter, and the separate parts being divided into a series of sections, the thought of this mode of division is too formal and cumbersome, and that it might have been simplified and made clearer.

The seventh volume of Tiraboschi's history treats of the 16th century, the age of Leo X., the Augustan age, as it is sometimes called, of Italian literature. This volume, which is still more bulky than the one preceding, is divided into four parts. After giving a sketch of the general condition of Italy during that period, of the encouragement of learning afforded by the various princes, of the universities, academies, libraries, and museums, the author treats first of the theological polemics which arose with the Reforma-tion, then of the philosophical and mathematical studies, of the natural history and medicine, of the civil and ecclesiastical jurisprudence, of historical writing, and of the Italian Hel-lenists and Orientalists. He passes next in review the Italian poets, among whom Ariosto and Tasso hold a con-cepicuous place, and afterwards the Latin poets, the gram-marians, rhetoricians, and medical men, and then the artists, among whom Michael Angelo, Raffello, Tiziano, and Correggio stand prominent. It is impossible to peruse this long list of illustrious names without being struck with the progress then made by the Italian mind in almost every branch of knowledge.

The eighth volume embraces the 17th century, which in Italy is scornfully styled the age of the 'seicentisti,' or the age of bad taste, a reproach however which applies mainly to the poets, and not even to the whole of them. The department of history is filled with good names, as well as
that of the mathematical sciences, in which Galileo holds the first rank. With the 17th century Tiraboschi concludes his work. Various reasons prevented his entering the field of contemporary history. This however has been done of late years by Lombardi, in his continuation of Tiraboschi's work. In 1779-84 he published Lettura Letteraria (in the Acerbo della Scienza in del Secolo in Modena), in which he directed his forces against the royal brothers, having been prevented from employing his army and in consequence of an insurrection of the province of Hyrcania. Corbolo therefore soon persuaded Tiradates to submit to the emperor Nero, and to prefer a moderate de
cision to an uncertain future. When they were about to meet, in order to settle the questions of the peace, Tiradates suddenly became sick, and the Romans, who would have been obliged to hasten a relief of this province, and to leave Armenia to the 12
sions of Vologeses. Tiradates therefore listened once more to the pacific proposals of the Romans, who were able to avoid any war with the Parthians if they could do so.

The duke of Modena, Ercole III. of Este, in consideration of Tiraboschi's useful labors, made him a knight, and appointed him member of his council in 1780. By the end of the order of habitants, Tiraboschi became a secular priest. In 1781 he began to publish another work of bibliography and biography: 'Biblioteca modenese, o Notizia della vita e delle opere degli Scrittori nativi o esili, di Modena,' 3 vols. 4to., Modena, 1781-86; to which he afterwards added a new volume, containing notices of the artists who were born in the dominions of the house of Este, after which he wrote the political history of the same country, in his 'Memorie Storiche Modenesi, col codice diplomatico, illustrativo con note,' 3 vol. 4to., Modena, 1793. He also published the history of the ancient monastery of Breviary of Nonantola in the city of Modena, founded about the middle of the eighth century by Anselmus, Duke of Friuli, and afterwards greatly enriched by Charlemagne and other princes, and which became a powerful community during the middle ages: 'Storia dell' antica Badia di S. Silvestro di Nonantola, aggiuntovi il codice diplomatico della medesima, illustrativo con note,' 2 vols. folio, Modena, 1784. The other works of Tiraboschi are: 1. 'Vita del Conte D. Fulvio Testi.' Testi was a lyric poet of the seventeenth century, and at one time a highwaysman of Modena, but ended his days in prison for state reasons. 2. 'Lettere intorno ai viaggi del Sig. Bruc.' inserted in the 'Notizie Letterarie' of Cesena, 1702; 3. 'Memoria della città di Reggio, ai savi secentesi,' 3 vols. folio, Modena, 1798. Tiraboschi died in Modena, June 17, 1784, of a disease brought on by sedentary life and constant application. He was buried in the church of SS. Faustino e Giov. Graco, outside of the city, and a Latin inscription was placed on his tomb, written by Father Pozetti, who succeeded him as librarian, commemorative of his labours and virtues, among which modesty and charity were most especially noted.

The Elogio di Girolamo Tiraboschi, by Pozetti, prefixed to the later editions of the 'History of Italian Literature,' contains a discourse on the use of the word historia, compared with the Latin historia and with various modern uses of the word. Tiraboschi served in the Library in the Modena.

Tiraboschi died in Modena, in June 1784, of a disease brought on by sedentary life and constant application. He was buried in the church of SS. Faustino e Giov. Graco, outside of the city, and a Latin inscription was placed on his tomb, written by Father Pozetti, who succeeded him as librarian, commemorative of his labours and virtues, among which modesty and charity were most especially noted.

The Elogio di Girolamo Tiraboschi, by Pozetti, prefixed to the later editions of the 'History of Italian Literature,' contains a discourse on the use of the word historia, compared with the Latin historia and with various modern uses of the word. Tiraboschi served in the Library in the Modena.
Tiryns was an ancient city of Argolis, in the Peloponnesus, situated in 37° 40′ N. lat., and 21° 4′ E. long., at no great distance from the head of the Argolic Bay, near the Gulf of Napoli di Romagna. According to a legend in Iliad (iv. 373) and to Strabo (v. 364), Tiryns was built by the hand of Tityrus, an ancient king of Argolis, who in the construction of the citadel employed masons from Lycia, who were called Cyclopes. The Greeks attributed most architectural works which were characterised by rude massiveness and great antiquity to the Cyclopes, and such works were consequently described as Cyclopean. Homer (Iliad, ii. 559) calls Tiryns the 'walled,' or rather the 'wolly' Tyrins; and Pausanias (ii. 25), 1000 years after him, thus describes the fortress:—"as it existed in the second century of our era, the ruins of Tyrins," he observes, 'were on the right of the road leading from Argos to Epidaurus. The wall of the fortification, which still remains, is the work of the Cyclopes, and is built of unwrought stones, so large that it was thought the workmen could never have used them. The intervals between them have been long since filled up with smaller stones, so as to make the whole mass solid and compact. No cement or mortar was used in these constructions, and it is evident that they were the first rude attempt at building with stone among the Pelasgic Greeks, and constituted their first style of architecture.' The second is still visible in the remains of Mycenae. The ruins of Tyrins are thus described by Col. Leake, in his 'Mores,' vol. ii., p. 350:—'They occupy the lowest and flattest of several rocky hills, which rise like islands out of the level plain. The length of the summit of that of Tiryns is 905 feet, the breadth above the plain from 20 to 50 feet; the direction nearly north and south. The entire circuit of the walls still remains more or less preserved. Some of the masses of the stone are shaped by art, some of them are roughly angular; but these are probably repairs, and not a part of the original work described by Pausanias. The finest specimens of the Cyclopean masonry are near the remains of the eastern gate, where a ramp, supported by a wall of the same kind, leads up from the plain to the citadel; but here the fortifications exist to the height of 25 feet above the top of the ramp; but this is the only part in which the walls rise to any considerable height above the table summit of the hill within the fortress.' The entrance was a stone of about 6 by 3.6 by 3.6. Here the wall is 2.44 feet in thickness; in other parts from 20 to 23. But the principal entrance was not here, I think, but on the southern side, adjacent to the south-east angle of the fortress, where a sloping approach from the plain is still to be seen, leading to an opening in the wall.

In its general form, Tiryns have consisted of an upper and a lower enclosure of nearly equal dimensions, with an intermediate platform. The southern entrance led, by an ascent to the left, to the upper level, and by a direct passage between the upper enclosure and the north-western wall of the lower, and also a branch to the left into the middle platform, the entrance into which last was nearly opposite to the eastern gate already described. There was also a postern on the south-eastern side. It is curious to remark that this is a typographical error. (Tactius, Hist., xvi. 23.)

The latter circumstances of the life of Tiridates are unknown. [PARTHIA.]

Tyrhennian, November, re•calls of Cyclopes, of gained 5C.

Tyr was a small town in the island of Melos, situated in 35° 50′ lat. and 24° 50′ E. long., within the territory of the Greeks, at the mouth of the Melian gulf on the west side of the island. It was a most ancient city of the south of Crete, and is also represented by the ancient name of Tius, whence afterwards the name of Turkey is derived.

(Tyrus, Stein; Cannabich; Hörschelmann.)

TIRO. [Cicero.]

TIIRADORE. TABLES OF. [Vida Ganta.]

TIRANO. [Harde.]
TISCHBEIN, JOHN HENRY WILLIAM, called the Younger, the youngest son of John Conrad Tischbein, and nephew of the preceding, with whom he in some respects was connected, was born at Hayna in 1791. He was educated by his father and a very early age was placed in the Stadion, through whose assistance he was enabled, in 1793, to visit Paris, where he remained five years with Charles Vanloo, and acquired his style of painting. From Paris he went to Venice, and there studied eight months with Piazzetta: from Venice he went to Rome, where he remained two years; he again visited Piazzetta in Venice, and after a short time, in 1791, he returned to Cassel, where, in 1792, he was appointed cabinet painter to the landgrave.

Tischbein painted in historical pictures of Mythological subjects, in which lines are his best pictures, painted from about 1792 until 1798; he died in 1798, as director of the Academy of Cassel, and a member of the Academy of Bologna. A biographical notice of Tischbein with an account of his life is published in Nürnberg 1797, eight years after his death, by J. P. Engelhehl, entitled: 'J. H. Tischbein, als Mensch und Künstler dargestellt.'

In that work there is a list of 144 historical pieces by Tischbein, of which the following are the better known:

- The rescue of Christ, very large figures, painted in 1783, for the altar of St. Michael's church at Hamburg; the Transfiguration, in the Lutheran church at Cassel, 1795; Hermann's Trophies after his Victory over the Persians, and the picture of the ten pictures of the Life of Cleopatra, painted in the palace of Weissenstein, 1769-70; sixteen from the life of Tlemachus, in the palace of Wilhelmy筝; An Ecce Homo, in the Roman Catholic church at Cassel, 1782; a Death of a Deposition from the Cross, and an Ascension, altar-pieces in the principal church of Strauland, 1787; Christ on the Mount of Olives, an altar-piece presented by him to the church of his native place Hayna, 1788; the Death of Alcestis, 1790; and the Restoration of Alcestis to her husband by Hercules, 1777.

Tischbein painted many pictures from the ancient poets, and some from Tasso; several of which are now in the Picture-gallery at Cassel. He painted also a collection of female portraits, which were very much in demand, and which now at the palace of Wilhelmy筝 near Cassel, He afterwards frequently copied his own pictures. Nearly all his works remain in his own country, on which account he is little known outside of it. It is remarkable that of all the great galleries in Europe, Munich is the only one that possesses a specimen of his works, and that is only a portrait.

Tischbein painted very slowly, but he was very industrious; he was generally at his easel by five in the morning in the summer time, and he painted until four in the afternoon. He painted in the French style; his colouring was a mixture of the French and the Venetian, and in large compositions very gaudy, but his drawing and chiaroscuro were very good. In costume however he was incorrect; a correct painter who has his own information would allow him to be, and it is a fault that he had in common with most of the great painters, especially the Venetians; but according to the critics he generally contrived in his antithetic pieces to make his actors look much more like Frenchmen and Germans than Greeks or Romans. In his religious pieces he was more successful; he had no follower of Lessing's theory of beauty; he considered beauty of little consequence. He etched several large pictures of Venus and Diana, Women Bathing; Hercules and Omphale; Menelaus and Paris; Thetis and Achilles; and his great picture of the Resurrection of Christ, at Hamburg.

Tischbein was of very domestic habits: he had an o.d servant named Conrad Otto, without whom he used to say he should be helpless; he had a cook also who lived with him 21 years. He was twice married, and yet was a husband scarcely four years: he married his first wife in 1766, by whom he had two daughters; he lived with her three years, when she died, and in 1769 he married his sister, with whom however he lived only a few months.

His elder daughter Amalia was a clever painter; she was elected, in 1780, a member of the Academy of Cassel; she used to sit to her father for historical works. After Tischbein's death, the Landgrave of Cassel purchased all the works that were in his house, and placed them together in the palace of Wilhelmy筝. (Meissel, Miscellenen Artistischen Industrie; Faksimilie Pokale der Künstler; Tischbein's Nachlass.)

TISCHBEIN, JOHN HENRY, called the Elder, one of the most celebrated painters of the eighteenth century, was the eldest son of a baker of Hamburg, and was born in 1702. He was first apprenticed to an uncle on the mother's side, who was a locksmith; but he displayed so much talent for drawing, that an elder brother, John, in 1719 emancipated him from his uncle and apprenticed him to a goldsmith in Hamburg, in his fourteenth year, with a paper-stainer and decorator of Cassel, of the name of Zimmermann. He received also some instruction from Van Freese, the court painter at Cassel, and soon gave proof of his ability. Tischbein painted in the studio of his uncle, and in 1722 returned to Hamburg, where he remained five years, and in 1727 returned to Cassel and painted portraits and historical pieces. He visited also Hanover and Berlin, and painted many portraits in both places. In 1779 he left Cassel, by the name of the Landgrave, for Italy, but he spent about two years in Zürich, where he painted many portraits and made a copy of the large painting of Hercules attacking the Nemean Lion, playing, after his sentence to death, a game of draughts with Frederick of Austria. In 1781 Tischbein arrived in Rome, and his first studies were some copies in oil after Raphael and Guerinco, and some drawings after Raphael. He was called to Dresden by Augustus III, and in 1782 became a pensionary of the Academy. A large picture was Hercules choosing between Vice and Virtue, after which he painted his picture of Cosmas and Damian, now in the palace of Pymont. In 1790 he went to Naples, and the next year painted the picture of the crown-prince for the queen, who presented Tischbein with a valuable snuff-box and 200 ducats, expressing her complete satisfaction with the picture. In Naples he appears to have acquired laurels rapidly, for in 1790 he was appointed grand officer of the army with a salary of 5000 ducats per annum, which however he lost again in 1794, at the breaking out of the revolution at Naples, but he found no difficulty in obtaining permission from the French authorities to return to Germany with what property he chose to take with him. He returned to Hanover, where the painter Hackert and another, for Leghorn, took him the plates of his illustrations to Homer, his designs for Sir W. Hamilton's second collection of vases, and other works of art; but the ship was driven by a fresh wind upon the coast of Corsica, and was captured by a French ship of war; it was however set at liberty again, and after a troublesome journey of four months Tischbein at last reached Cassel in safety. During his residence at Naples he painted in 1797 a picture of the Roman Colosseum, in two parts, folio, entitled: 'Tiz des Differente Anmausk, dessinés d'après Nature, pour donner une idée plus exacte de leurs caractères.'

The first part contains designs of the various parts of the Colosseum, and the celebrated design called in Italy 'Tischbein's L'auto,' represents a large snake attacking and destroying a woman and her young in their den; a design of remarkable power and spirit: the second part contains 6 plates only, consisting of characteristic heads of men and gods, as—Correggio, Salvator Ross, Michael Angelo, Raphael, Scipio Africano, Caracalla, Jupiter, and Apollo. Tischbein after his return to Germany lived principally at Hamburg and Cassel. While in Oldenburg near Lübeck, the majority of his works in the collections of the great princes of Germany, the following paintings are three of his most celebrated works:—Ajax and Cassandra, painted in 1805; 'Let the Lusitans come unto me,' painted in 1806, for the altar of the church of St. Anton in the city of Hanover; and the picture of Andromache, painted in 1910. He painted also the portraits of Klipstock, of Heyne, and of Böcher.

In Göttingen in 1801-4 he published in royal false to his favourite work on Homer, with explanations by Heyne—Homer's Versuch zu einer systematischen Geschichte des Direktor, &c., mit erläuternden von Chr. Gortz. Heyne, 1-vi, each containing 6 plates: the portraits of the Homeric heroes were engraved by R. Morphin. Tischbein's works for Sir W. Hamilton's third collection of vases, published at Naples from 1791, in 4 parts, amount to 214: the work is entitled 'A Collection of Engravings from Antient Vases, mostly of pure Greek workmanship, discovered in Sepulchres in the Kingdom of the
Two Sicilies, but principally in the environs of Naples, during the years 1780 and 1781; now in the possession of the archives of the Royal Academy of Painting at Naples. The text, which is in French and English, is by the Italian
Tischbein published other works, and etched also several plate
Paul Potter, Ross, Ross di Tivoli, Rem
his expression and colouring good, and he excelled in
drawn animals. He died in 1829. There were many
other artists of this family, of various degrees of merit, but
the most estimable, his own circle.
(Füssli, Allgemeines Künstler Lexicon; Kobler, Handbuch
Bills, 1798.
T S I S.
TISIAS. [Oratory.
TISCHBEIN. [Cypres Younger.
TISRORE, AMBROSE, a Swiss physi

1728. He studied first at Geneva, and then at Montpellier,
he took his degree of Doctor of Medicine. He then returned to Switzerland and settled at
Lausanne, where, he joined to an extensive practice a con
considerable degree of theoretical knowledge. His reputation
spread rapidly through Europe in consequence of his me
medical publications, and caused him to be consulted from all
parts of Europe. The following is a list of the most
important situations at different foreign courts and un
versities, all which he declined, and remained satisfied with
the respect and comfort which he enjoyed at home, and
with the office of professor of medicine at the college of
Lausanne. He was not himself, or treated, by the solicitation of the emperor Joseph II., who conferred on him
the professorship of medical science at the university of
Pavia. Being thrown thus late in life into so difficult a post
being naturally of a modest and shy disposition, he did not at
first answer the expectations formed of him.
However there soon after broke out in the province an epidemic bilious fever, as to the treatment of which
the physicians of the place were not agreed. On this occasion
the emperor, after having thrown out to the academic
archdeacon, gave orders that Tissot's directions should be
followed, as he had treated a similar disorder with great
success in the canton of Le Valsais in 1765. His system
was again successful, and the students not only celebrated
his triumph with Hit, but, wishing to render to the memory of
it more durable, they caused a marble inscription, be

TISUES, VEGETABLE. The various organs of plants,
as the leaves, flowers, roots, stem, &c., are composed of
certain ultimate structures, which are called elementary
or vegetable tissues. Most parts of an animal
in its present state, the naked eye is an almost perfectly ho
mogeneous character; and it is only by calling to our aid
the microscope that we can distinguish the various struc
tures of which they are composed. On taking a leaf or a
bit of skin, and immersing it in a fluid, and sub
mitting it to the microscope, it will be found to consist,
1, of a thin transparent homogeneous membrane, which
is arranged in the form of cells or cylindrical tubes; 2, or
fibres, which are arranged in a spiral form in the interior
of the plant; and 3, a fluid which is filled up the
filling the cells and existing between them, and containing
in its globules of various sizes and kinds. These parts
constitute what are known respectively as 'elementary
membrane,' 'elementary fibres,' and 'organic mucilage';
and the fluid from which it is developed, are the only two
which are constantly present in all plants.
Fibre is only found in the higher forms of plants.
The primary form in which organization appears is that
of the simple cell, which is composed of a membrane and
a fluid; and however complicated may be the forms which the tissues of plants may assume, they mostly originate in this primiti
form. Some late researches on the development of
in animals seem to lead to the conclusion that
some of these tissues are formed from a primitive fibre;
and from analogy it has been supposed that the same may
occur in vegetable organization. Whether however the
cell or the fibre shall be determined to be the primitive
form of the vegetable kingdom is a little doubt that the cell is so in the vegetable kingdom.
The development of the cell itself is a subject of much
interest, and great light has been thrown on this obscure
department of physiology by the late researches of Dr.
Schleiden. It was found that in the cells of the tissue of
the Orchideaceae plants there was an opaque spot, or 'areola,' in the interior of the cell:
Schleiden, finding this spot very constant in the cells of
some plants, concluded that it must have some important
relation to them, and submitted it to a very strict exami
nation. He found that these bodies were the original
particles from whence the cells were formed; hence he
called them cytoblasts. The best parts of the plant for
observing the phenomena to which these bodies give
rise are, the large cell which exists between the embryo
and the membranes of the seed, and in which the albu
men is subsequently deposited, the embryonal sac, and the
end of the pollen tube from which the grana are developed.
In the gummy fluid that exists in these
parts in the process of growth a number of granules are
developed, rendering this transparent homogeneous fluid
opaque, or almost opaque. It is among these granules,
which assume a brownish-yellow colour under the influence of
tincture of iodine, that the cytoblasts make their appear
ance. Whilst in this state the cytoblasts increase con
siderably in size, becoming larger than the granules of the
gum; and as soon as they have attained a certain size
poised upon their surface: this is the young cell, which at first represents a very flat seg
ment of a sphere, whose plane side is formed by the cytoba
and the convex side by the young cell, which is
situated on it, somewhat like a waxy disc. It is almost distingui
shable in this circumstance alone, that the space between its convexit


\[ \text{TIS S} \]
and the cytoplasm is perfectly clear and transparent, and probably filled with an aqueous fluid, and is bounded by the surrounding mucous granules, pressed back by its expansion. But if these young cells are isolated, the mucous granules may almost entirely be removed by shaking the stage of the microscope. This cannot however be long continued without causing the cell to swell, in consequence of the insensible outflow of water from the cytoplasm backwards into a distillate water, leaving the cytoplasm behind. The vesicle gradually gets larger and becomes more consistent, its particles being formed entirely of vegetable gelatine (Gal-lerite); and this the cytoplasm, which always forms a portion of the wall. The whole cell now gradually enlarges beyond the edges of the cytoplasm, and gets so large, that at last the latter appears as a small body enclosed in one of the side walls. At this point the cytoplasm assumes the character of the protoplasm described by Bort. The young cell frequently presents great irregularities, a proof that the expansion does not proceed regularly from a fixed point. The cell grows progressively, and becomes, under the influence of surrounding objects, more regular, and most frequently assumes the form of a rhomboidal doederedahedron. The cytoplasm still remains in the cell, partaking of the life inherent in the cell, unless it is in cells destined to a higher development, when it is either reabsorbed in the wall, or it forms off into a useless mass, to which it forms a number, and there reabsorbed. It is only after the reabsorption of the cytoplasm that secondary depositions are observed to commence on the inside of the walls of the cell.

(Schleiden.)

The cytoplasm remains in the cells in only a small number of cases. They are found in a portion of the cellular tissue of Orchidaceae, also of Cactaceae. In hairs likewise, and cells in which the function of cyclosis is carried on, they are very frequently present; also, in fibres or woody tissue, and spiral fibres are generated both in cells and tubes, constituting the various forms of fibro-cellular and vascular tissue, and it will be necessary to say a few words on their development. One great error that has arisen from the naming and classification of the tissues of the plants has been the supposition that they were essentially distinct and possessed a different origin. This is seen in the theories of the origin of wood. Woody fibres are nothing more than elongated cells with thickened walls; but they were for a long time erroneously regarded as a separate cellular tissue; and an ingenious theory of Du Petit Thouars has been adopted by many eminent botanists for the purpose of explaining this phenomenon.

(Schleiden.)

Du Petit Thouars says, 'The wood is not formed out of the bark as a mere deposition, but it is produced from matter elaborated in the leaves sent downwards, either through the vessels of the inner bark along with the matter for forming the liber, by which it is simultaneously passed with, or it and the liber are transmitted distinct from one another, the one adhering to the albumen, the other to the bark. I know of no proof of the former supposition; of the latter there is every reason to suppose it is correct.' And Lindley adds, 'The property of increasing the species that buds agree with seeds, but that they emit roots in like manner; and that the wood and liber are both formed by the downward descent of bud-roots, at first nourished by the moisture of the cambium, and finally imbedded in the cellular tissue which is the result of the organization of that secretion.' This theory then supposes that woody tissue is set down as a deposit from buds and leaves. But it is much too gross a theory to be admitted. The generation of the leaves in elaborating the sap, and preparing the secrections of which they are certainly not the only agents engaged in developing the woody tissue. There are many parts of plants that possess no leaves, and some whole orders, as Cactaceae, the leaves of which are only less woody in character. Trees also that have the bark removed in a circle from the stem at the spring of the year, before the leaves are developed, will at the end of the year exhibit between the bark and wood new woody tissue. This was proved by a series of experiments performed on beechn-trees by Dr. Lankester. The existence of woody excrecences in the bark of trees is also another fact opposed to Du Petit Thouars's theory. These excrecences exist in the form of knots, and are formed on the outside of the bark of the tree. On examining them it will be found that they have no connection with the wood of the tree, and consist of several layers of contorted woody tissue, enveloped in a bark of their own, consisting of liber and cell-tissue. The size of all these, from a more point to that of an orange. The smallest consist of cellular tissue, in the centre of which a darker spot is seen, as though the tissue was injured or diseased. It is around this spot that the fibrous woody tissue develops. These excrecences appear to have their origin in an undeveloped bud, and hence they are called by Dutrochet embryo-buds; but as they go on increasing in size, and development occurs in a circular, rather than a longitudinal direction, as described by Lankester as abortive branches. From the researches of Schleiden there can be little doubt but that the elongated tissue is developed in the same manner as cell. A question that still arises, and requires solution, is, whether the single fibres are all of one kind, or of several. In the tissue called pitted or Bothromycena, there are evident indications of its cylindrical tubes being formed of several cells united together, and the walls, being absorbed at their point of union. The above observations of Schleiden have set aside the supposition that the cell is composed entirely of spiral fibres intimately superposed. But still the question recurs as to whether fibres may not be generated irregularly, or in the manner of membranous or circular membrane in the genus Stellis; Lindley observed them in Collotites, and many other instances are known in which fibres are local in plants without any apparently enveloping membranous tissue. The latest researches of Dr. Muirhead have shown that a fibro-membraneous animal tissue from the spiral fibre of the bisexual globule have induced some botanists to examine the question; and Dr. Wills, in a paper in the 9th volume of The Annals of Natural History, has endeavoured to prove that the irregular-shaped bodies marked with dark lines and found in the juices of many plants, are the protoplasm of pure fibrous tissue. If such a development of fibres takes place, it can be only in exceedingly rare cases. Schleiden in his memoir on Phytogeny states that fibrous tissues are never formed free, but always in the interior of cells, and that the walls of these cells in the young state are simple and of a very delicate texture.

(Quiz.

Whether fibre is formed independently of a membranous ingredient, not, that is to say, whether it is formed by the formation of a layer or a number of layers of cellular tissue in the inside of cells and tubes forming the fibro-cellular and fibro-vascular tissues. According to Schleiden, the cells in which the development of fibre takes place are in the commencement of the formation of the fibres itself, the cells are small, but when mature they pass into the state of mucea or gum, and then into that of gelatin (gallerite). From this latter vegetable fibres are formed which in their development always follow the direction of a spiral line, whose coils are narrower or wider according to circumstances. The development of the fibre is the same in the spiral vessel as in the spiral cell, and being different in the two but in their dimensions. In the first volume of the Transactions of the Royal Society of Edinboro, he gives the following account of the development of fibre as the vascular tissue of plants:—When the young vessel (that is, membraneous tubes) are recognised, they appear as pellucid glossy tubes, with a cytoplasm in some part of their interior; and at an earlier than this they are not recognised from cells. As they grow older the cytoplasm diminishes, and the contents, which at first were clear and gelatinous, become less transparent from containing thousands of granules, which are too small to allow of the passage of light. As a result of these, the vegetable fibres, as above these atoms are about the size of an inch in diameter, and have the motion known as 'active molecules.' If the vessel be wounded at this period, the gelatinous contents pour out, but we only after the injection of an active molecule. These molecules are still more clearly seen. These atoms, from their freedom of motion, are arranged indiscriminately; the interior of the vessel, and in a short time some of them
enlarge, and then transmit a little light, which, on account of their minute dimensions, is not suffered to pass as a white pencil, but is decomposed in its course, the granule thereby becoming of a greenish hue. The granules exhibiting this greenish hue are now in a fit state to enter into the composition of the fibre that is to exist in the interior of the membranous tube. This is effected in the following manner:—The granules which are in active motion in the viscid fluid near one of the ends become severally attracted to the inner wall of the vessel, beginning at the very point; those granules first attracted appear as if cemented to the spot by the viscid fluid in that direction losing some of its watery character; for there appears a string of a whitish colour, besides granules, in the line which the fibre is to become the parenchyma. Following this, the other granules are attracted to those already fixed in an inclined direction, the spiral course is soon to be seen, and the same action progressively goes on from the end which it began towards the other, around the interior of the tube in the form of a spiral; the fibre being produced, like a root, by having the new matter added and continually attached to the growing point, thereby causing its gradual elongation. Spiral cells and vessels thus formed exhibit a great variety of appearance, depending on the period in the age of the cell or tube at which the development of the fibre takes place, as well as the modifications that occur in the chemical changes of the substances from which the fibres are formed. The cause of the arrangement of the particles in a fibrous form is satisfactorily explained, and it is most commonly referred to an attraction between the sides of the membrane, of the cell, and the particles it contains, but why they form a spiral is a mystery yet to be solved. [Spiral Structure of Plants.]

The various forms of vegetable tissue found in the different organs of plants are included in the following arrangement:—

I. FIBROUS.

Tissue in which elementary fibre is alone apparent.

II. CELLULAR.

Tissue composed of membrane in the form of cells whose length does not greatly exceed their breadth.

1. Parenchyma, the cells of which touch each other only at some points.
2. Parenchyma, the walls of the cells of which are generally united.
3. Parenchyma, the cells of which are always fusiform, and overlie each other at their ends.

III. VASCULAR.

Tissue composed of cylindrical tubes of membrane continuous, or overlapping each other at their ends.

1. Phloem, the sides with the tubes thickened and tapering to each end.
2. Cenophyta, the sides of the tubes of which anastomose, and convey opaque fluid.

IV. FIBRO-CELLULAR.

Tissue composed of cells, in the inside of which fibres are generated.

a. Genuine.
   1. Fibrous cells.
   2. Fibrous cells.
   3. Dotted cells.

b. Spurious.
   1. Spinal vessels.
   2. Annular vessels.
   4. Scalariform vessels.
   5. Purpuraceous.
   6. Dotted vessels.

V. FIBRO-VASCULAR.

Tissue composed of tubes, in the inside of which one or more spiral fibres are more or less perfectly developed.

a. Genuine.
   1. Spiral vessels.
   2. Annullar vessels.
   4. Scalariform vessels.
   5. Purpuraceous.
   6. Dotted vessels.

This arrangement includes the principal forms of tissue observed in plants, but the divisions are not founded upon any essential difference in the structure or functions of the various tissues. The most important distinction exists between membrane and fibre, which are apparently developed under the influence of different forces. The cell and the tube differ but in their dimensions, and the same is true of them when fibre is generated in their inside.

Fibrous Tissue.—Although the development of fibre independent of membrane is not exhibited in the parts of plants exhibit fibres disseminated of membrane. Fibres spirally arranged and adhering only together by vegetable mucous, which is dissolved away by the application of water, as noticed in the outer cortex of vegetables, and by Lindley, in the same position in Collomia linearis. Meyen, who maintains that all cells may be composed of minute fibres, records many instances of vegetable structure in which fibre of a spiral form alone is most apparent, and even the same layers of cells. The bishop of the Pharos, and Quadrat, in the inner layer or bark of the aerial roots of many species of Orchidaceæ, and also in species of Melocactus and Mammillaria. Fibres not assuming a spiral form, and independent of cells or tubes, have been described by Purkinje. In the lining of the anthers of Polygalæ Chamaebuxus they are found short, straight, and radiating; in the anthers of Linaria cymbalaria they form distinct arches; and in those of some species of Campánulas, they are arranged like the spirals of a conical. Fibre in all these cases varying from 10 to 200 of an inch in diameter. It is most commonly transparent and colourless, but in some cases has been observed of a greenish colour. Purkinje, who has recently investigated it very attentively, asserts that it is hollow; but Schleiden and Monn are of opinion that it is solid.

Cellular Tissue; also called urticcular and vesicular tissue: the Parenchyma of Lindley and Moren, tela cellulos of Lin and, containing, a complexus of old writers; Zellgeesee, Germ.; Tissu cellulaire, French. This tissue consists of cells or cavities, which are closed on all sides, and are formed of a delicate, mostly transparent membrane developed from a cytoplasm. It is present in the vegetable vegetable form; and all the plants, constituting the class Acrogens, are composed entirely of it, and have hence been called Cellular. In the higher plants it is most abundant in fruits and succulent leaves. It exists in large masses, in form of leaves, as trees, and the younger the plant is the more it abounds, and constitutes the entire structure of the embryo.

The normal form of the cells is spheroidal, and when they exist in this or in an elliptical form, and only touch each other at a few points without exerting pressure, they constitute the tissue called by Meyen Merenchyma. The cells in this case may form a regular or an elliptical layer, a distinction which may be of some importance. Such tissue is found in many parts of plants, especially those which are delicate and easily torn, as in the strawberry, in the petals of the white lily, in the stem of Cactus pendulus, where they are spheroidal, and in the leaf of the Agave Americana, where they are elliptical. The cells also constitute the entire of many of the lower plants belong to this division of cellular tissue. They are seen separate or loosely adhering to each other in the Proteococcus nivalis, the plant of the Red snow [Snow, Rux], in many of the fruits and rinds, as Ustilago and Urelo. Chrolobeus, and many of the lower forms of algae and fungi, consist of filaments which are entirely composed of spheroidal cells arranged one upon another.

In the higher forms of plants the vegetative force is greater, and a greater number of cells being generated in a given space, they press on each other on all sides, assuming a variety of forms, and constituting the tissue called by Meyen Parenchyma. The most common form which the cells present under these circumstances is the rhomboidal dodecahedron, which is the most assumed that a globe assumes when subjected to the pressure of a number of globes touching each other at the same time. These cells when cut through, as in the section of a portion of pith, or the pith of a plant, will present their cut margins, seen when observed through the microscope, in the form of hexagons. (a and b, Fig. 1.) But the pressure is not always equal on all sides of the cells, so that a great number of secondary forms are the result. When the vesicles become elongated, they assume the form of a cone, with the base an angled prism, terminated by four-sided pyramids, whose bases replace the angle of the pyramids at varying degrees of inclination to the axis. Many of the forms thus assumed characterise parts of plants, and are very constant in the
The principal varieties of Parenchyma distinguished by Meyen are

Fig. 1.

1. The cubical, which exists in the cuticle of some leaves, and is not unfrequently met with in bark and pith, as in the pith of Viscum album. (c, Fig. 1.)

2. The columnar, of which there are two varieties: the cylindrical (cylindrenchyma of Morren), examples of which may be seen in Chara and in Agarica muscaria, is the prismatical (prismenchyma), frequently seen in the pith and the bark of plants, and when compressed it becomes the muriform tissue (e, Fig. 1.), which is constantly found in the medullary rays, and has its name from the cells being arranged as bricks in a wall.

3. The dodecaedral: the natural form of parenchyma when the cells are of equal size and exert on each other equal pressure, and when cut present a hexagonal form. (a, c, Fig. 1.)

4. The squinated (actinenchyma), in which the cells, from the irregularity of their walls, assume a star-like form, seen in Musa.

5. The tabulated, seen in the epiphloëm of many plants: other forms, as conical (conenchyma; A, Fig. 1.), oval (ovenchyma), fusiform (aetrenchyma), sinuous (colp enhyma), branched (cladenchyma), entangled (da dalenenchyma), have been described by Morren.

Parenchyma differs from Parenchyma in the cells always having an elliptical form which taper to their extremities, where they overlie each other. This form of tissue is found only in the bark and wood, and is a transition from cellular to what is called woody tissue. Meyen applies this term cellular to the tissue forming the wood of Conifera and Cycadaeae. In these families this tissue is marked with dots, which are surrounded by a circle.

Fig. 2.

(Fig. 2.) These dots were formerly supposed to be glands, and to secrete the resinous matter which abundantly in them, and hence it was called 'glandular woody tissue.' The researches of Mohl and others have however shown that these dots are the result of the development of fibre within the walls of the cells, and in this view the Parenchyma not only constitutes a transition from cellular to vascular tissue, but also a transition from fibro-cellular to fibrovascular tissue.

Contents of Cells.—The vesicle of cellular tissue when it arises from its cytoplasma is a thin transparent membrane, which as it enlarges becomes thickened from within by the appropriation of proper nutriment which is contained in the cell. This cell in the early stages of its growth is filled with a fluid, at first clear, but afterwards opaque from the development in it of minute granules. These granules are of various shapes and sizes, and always excessively minute. In their early stages they possess the characters of starch, more particularly the property of assuming a blue colour when brought in contact with a tincture of iodine. In the older cells many of the granules lose the character of starch, and possess other properties. Some of them are more minute than those of starch and are not coloured by iodine, and are not partake of a resinous character. They give the pressure colour to the elaborated sap, whatever that may be, and in plants with milky juices constitute the cascincheum which they yield. They seem also to be the constituents of the volatile oils, resins, balsamas, etc. that they yield. (Secretions, Vegetables.) Another set of dots are also found present in old cells, and these consist of what is called chlorophyl, or chlorum, and exist especially in the cells of plants on their surface, giving to them a peculiar colouration. (Sap.) It is from the remaining masses of starch that the cells are nourished. Previous to being appropriated by the walls of the cell they are converted into a substance called by Meyen vegetable jelly. It is from this substance, varying in most plants, that the cells are thickened, by which the cuticular membrane in many cases becomes excessively hard, as in the stones of many fruits, the seed of the Pteris, Macrorops, and the wood of many trees. In simple cellular tissue, as seen in woody tissues, they are equally to the whole surface of the cell, forming regular layers: in the fibro-cellular and fibro-vascular tissues a a a a appropriated in the form of bricks, the little blocks, as in the case of the walls of the parenchyma in the interior of cell and which appear to have nothing to do with the cavities of the plant, are those crystalline bodies called Kalkspat. They occur singly or in bundles, and have a cubic form, and are long or short according to circumstances. They occur in abundance, a very long time after the wall has been secreted. These crystals were first observed in the proper case of plants, and have been subsequently found in all parts of plants where cellular tissue exists. They were formerly supposed to exist between the cells, but later observations have proved they exist in the cells, and that they occur in two situations. The form of these bodies is not satisfactorily determined. Mohl describes them as right-angled faceted prisms vanishing into points. Quekett, who is one of the latest observers on this point, says they are bipyramidal or four-sided prisms, but not as right-angled. They which are conglomerated are called crystal-glands (breu drüsen) by Meyen. They seldom present more than the pyramid of each little crystal composing them. The proportion in which they exist in plants is sometimes very great. In some species of Cactaceae, according to Quekett, the crystals equal the weight of the dried tissue. The hundred grains of Turkey rhubarb-root yield between 40 and 40 grains of raphides; the same quantity of tissue of Scilla alba, on the other hand, yielded 10 grains of raphides. These crystals are composed of either oxalate or phosphate of lime. Raspail says the crystals of the oxalate of lime are four-sided prisms with pyramids of the same base; those of the phosphate, six-sided prisms. In Chara cristata carbonic acid of lime occur in great quantities on the outside of the tissue, and we have observed them in the intercellular passages immediately under the epidermis, but they do not occur in the interior parts of the plant. Schiller found that the crystal-glands of Hydrurus crystallophorus consisted of carbonate of lime, and Saizy an. De la Fosse found silica in the crystals of the Mirabilis Jalapa. Silica is a very prominent constituent of the Gramineae, but is seldom found crystallized. It gives the bamboo the characteristic hard tough fibres, which are secreted in large quantities in the joints of the stem of the bamboo, and is used as an article of commerce under the name of Tubabheer. From the variable form of the crystals in plants it may be inferred that they have formed themselves in various situations. These bodies do not appear to be necessary parts of the tissues in which they occur, and they have been compared by Link to calculi and other concretions in the animal kingdom. This view is rendered very probable by the fact that they are all formed from fragments of the minerals which the plants take up from the soil as necessary nutriment. Meyen has pointed out the fact that pine growing near the sea will throw off the superabundance of chloride of sodium in their tissues in the form of crystals; and the same is the case of the jellyfish, which are abundant in Chara flexilis, where the water in which they grew contained most of that substance. Phosphate of lime
is necessary to the nutrition of many plants, and the elements of oxalic acid exist in the sap of all plants; and when these are in greater abundance than the vital energies of the plant can appropriate, the laws of chemical affinity come into play, and crystallization is the result.

The walls of the loosely spheroidal cells in merenchyma consist of a single membrane, but the walls of the more closely pressed cells of parenchyma consist of two membranes, originally distinct, but fused into one by growth. Frequently happens that the walls of the cells are not entirely smooth, and the spaces of various kinds occur between the cells. These are called intercellular passages. They occur in the greatest abundance in the loose merrenchymatous tissue.

Another kind of intercellular formation is the air-cells, the lacuna intercellulares of Link, which are large cavities formed in the tissue of plants, and whose walls are entirely formed of cellular tissue. They may be very distinctly divided into two kinds, the regular and the irregular. The regular lacunae are of the same size, and vary in size, but have in all cases a regularity of structure, their sides being formed of equal-sized cells of cellular tissue. They may be seen in the leaf-stalk of Calla and of the Equisetum; in Lycopodium, in the petioles of Nymphaea. They are very common in water-plants. They are always filled with air in these plants, and serve as a means of buoying them up in the water. The irregular air-cells, lacuna of Link, are found in old plants; they arise from the growth of the plant tearing asunder the cellular tissue, or from a deficient development or even the absorption of this tissue in particular directions. They may be seen in the stem of the fronds of the Aspidium Filix Mas, of Hippuris and Equisetum, and in nearly the whole of the family Umbellifera.

The other organs which are formed by and found in the midst of the cellular tissue are the sponges and glons. The sponges, the opangia of Link, consist of enlarged cells which are all open to the sea and are closely elaborated. They are formed in the skin of the citron, pomegranate, &c. These are regular in form, but in the roots and rhizomes of such plants as the ginger, Anchusa, and Aristolochia, they are found of an irregular shape; the various directions the cells are made to take in the tissue the resin, gum, oil, &c. which give to the plant some of its peculiar physical properties.

The organs just enumerated as present in the cellular tissue are met with chiefly in the merenchymatous and parenchymatous tissues. The merenchyma, or Tubular Tissue consists of continuous tubes of simple membrane, and comprehends the woody and the xerrenchyous tissues. On the one hand they are distinguished by their length from the forms of cellular tissue, and on the other hand by their plane membrane from those tissues of which fibre forms a constituent element.

Plerenchyma, or Woody Tissue (vasa fibrosa of Link, and Fausergflasen, German), is found abundantly in the wood, of all plants, and especially the barks of trees. The culx arules are very small, and cannot be distinguished with the naked eye; and in fact all investigations on the structure, development, and functions of the tissues of plants, can only be conducted with the aid of the microscope. The measure of the cambium gives them a size varying from 4th to the 4th part of an inch in diameter. In the lower branches, as in the Fungi, their generation is very rapid, and it is well known that mushrooms, puffballs, &c. will attain a growth of a foot in the course of a single night. The force too with which they are very great, and many well-authenticated instances of agarsa springing up beneath pavements and displacing stones of great weight and size.

The tubes of woody tissue are very tough, and will resist considerable force without breaking. It is on this account that they are used extensively in the manufacture of cloths and of various manufactured articles of hemp and flax. The tubes of Tiliils, Daphne, Lagetta, and of many of the plants of the order of Malvaceae, are used for making mats, cordage, whips, &c. The following is a comparative table of the relative strength of silk and some woody fibre:

| Silk supported a weight equal to | 84 |
| New Zealand Flax | 239 |
| Hemp | 100 |
| Flax | 121 |
| Pita Flax (Agave Americana) | 7 |

The tubes of woody tissue give firmness and tenacity to the plant, and assist in conveying the sap from the roots to the leaves.

Chinenchyma, or Laticiferous Tissue, consists of tubes which are mostly branched and anastomosing; their walls are exceedingly delicate in young plants, and thicker in old ones; and they are characterised by conveying a fluid called the latex, which differs from the sap in other parts of the plant. (Sap.) The older botanists, Spigelius, Malpighi, and Grew described them, but they were generally confounded with woody tissue, till they were very fully investigated by S huttes. In older writers they are called Latex, but by Link, Latex proprius or parenchyma. Some writers have supposed that they are nothing more than intercellular passages, and have denied that they possess membranous parietes; but their existence has been ascertained, and the observations of Schultes on their structure confirmed by Link, Meven, Mohl, and others. The walls of these vessels are mostly plain, but have been sometimes observed marked with bars and fibres. They do not exit in all plants, and have not been found at all in the lower forms of Cryptogamia, nor in some of the Phanerogamous plants, as Valeriania and Stratiotes. Their most frequent position is on the sides of spiral vessels, or amongst the bundles of this tissue found in the midrib and nerves of leaves. They are most obvious in the order Euphorbiaceae, which form a white exudate in many instances the resin, gum, oil, &c. which give to the plant some of its peculiar physical properties.

The organs just enumerated as present in the cellular tissue are met with chiefly in the merenchymatous and parenchymatous tissues. The merenchyma, or Tubular Tissue consists of continuous tubes of simple membrane, and comprehends the woody and the xerrenchyous tissues. On the one hand they are distinguished by their length from the forms of cellular tissue, and on the other hand by their plane membrane from those tissues of which fibre forms a constituent element.
tissue, which can be well seen in Phytocrene, as in Cycas, a number of truncated porous cells are placed on the other side to form a cylinder, which becomes as the siphon or removal of the cellular tissue.

Porous vascular tissue is referred to this form by Link; it is one of the continuous Bothrenchyma, as the points or union of the cells are visible. Where but a few points of union of the cells are evident, he calls it the broken Bothrenchyma.

Dotted cells have their walls marked with dark spots. These cells have been observed in the pith of Calycanthus floridus and in the stem of Dracaena terminalis. They appear only to differ from the porous cells in the matter—whether they are formed having greater opacity, and transmitting the light so freely.

Fibro-vascular Tissue, or Trachenchyma (vasa epir. of Link), consists of tubes, in the inside of which the fibres are generated. The fibres of this tissue last, are subject to metamorphosis, the consequence of which is, the tubes present the appearances of transverse bright and dark spots.

The tubes consist of a large, median, or mostly cylindrical; it may be assumed to consist of a small prismatic form when the tubes are in bundles and closely together, as in ferns and many monocotyledonous plants.

The fibres generated in this tissue are mostly compressed and wind up the sides of the tube in a spiral form. When the membrane is broken, the fibres in most cases are unrolled. It is in the younger tubes that this is most effective; in the older tubes those changes are so connected with the fibres that the latter are not to be seen; the number of fibres included in a tube varies; it is frequently a single fibre, but in some instances many as twenty-two are counted. They have no fixed direction; some are right to left, others from left to right. Some difference of opinion has existed as to whether the fibres are tubes or not. Schleiden says in most instances they are solid, where they are formed from large globules of jelly, and appear to be tubular in both vascular and cellular tissue. Link, on the contrary, says the fibro-vascular cells are true tubes, and that the fibres are proper perfect fibres. The principal forms of Fibro-vascular tissue are the spiral, annular, and multiform vessels. The spiral vessel consists of a tube, in which one or more fibres run continuously along its sides from one end to the other (d, e, f, Fig. 4). When the fibres are single, they are called simple. When there is more than one, compounded fibres are most abundant in young plants, as the character becomes changed by age. When the fibres become more abundant to the sides of the membrane, they are said to be closed. The spiral vessel was at one time considered a very important tissue, performing an essential vital function. From the circumference of air being frequently found in them, and this air containing a larger quantity of oxygen than the atmosphere, they were supposed to carry on the respiration. Subsequent observation has proved that they are more likely to be reduced to air, as Meyen supposes that they are only filled with air when a larger quantity of fluid ceases to be required by the plant. Annular vessels or ducts consist of tubes with perfect rings of fibre on their sides. (g, Fig. 4). These are evidently formed from the interruption of the spines, and the union of the broken ends, as they are frequently seen present with a spiral fibre in the same tube. When they are thicker: they are very abundant in monocotyledons.
wholesome, and scratching the tubes, and a perfect spiral fibre in its inner part. It has been proved by Slack that these vessels do not bear their peculiar form from accidential compression. They are the same as in one part or another of the suk-kot, in roots, and other parts where they meet with obsta-
cles to their longitudinal development.

Spurious fibro-vascular tissue includes scalariform, buse, and dotted vessels. The spurious vessels are not found in the tissues of young plants, and are either de-
developed after the appearance of the genuine spiroids, or formed from them. Meyen maintains the latter view, it Link and other botanists are still inclined to give to spurious forms in all cases a secondary develop-
ment. In the medullary sheath, the spurious spirocircles are
never found in the young plant, although they are some-
where in the albumen and bark; but it is not necessary
that a pure spiral fibre should always be visible previous to its being converted into some one of the forms of spurious spiroids. If in a very large number of cases there is evi-
dence that rings, bars, and dots are formed from the
metamorphosis of spiral fibres, we may fairly conclude that the phenomenon is no appearance of a proved con-
trary, the same effects are to be attributed to the same

Scalariform vessels consist of tubes mostly prismatical,
with dots on their walls resembling bars or strips. These
are and are not found in different species; vol. 13, 1850,
according their name. They are abundant in fernes, where
the prismatic form of the spirocircles is most frequently seen.

Porous vessels are tubes with bright spots upon their
valves, which constitute the parietal thickenings of the Spen-
chyma of Lindley. They are found in greatest abun-
dance in the old wood of Coniiferæ, in the same positions
where spiral vessels are found, in the young wood, and
also in the roots of plants. The dots constituting what
were formerly a special class of vessels, vol. 3, 1851,
might be termed as character those of fibro-cellular tissue.
These vessels often attain a great size, measuring as much as a quarter of a litre in diameter.

Dotted vessels constitute the tissue which has been called
* glandular woody tissue,* and to which Meyen applies pecu-
narly the term *Procenchyma.* (Fig. 3; b, Fig. 4.) The dotted
vessel, like the dotted cell, has dark spots on the in-
side of its membranous walls; but in addition to the dot
there is also a circle. This dot does not appear to be formed
by the remains of a partly-absorbed fibre, or the crossing of
the fibres, as in some of the forms of porous cells and vessels,
but from the sinuous flexures of one or more fibres;
putting together, and forming between them a little cavity or depression, this is arranged on the
external membrane, which gives the appearance of the
larger circle surrounding the depression. (Fig. 2; b, Fig. 4.) These phenomena make their appearance very
early in the growth of the plant, and are more conspicuous
in young plants, examined, the sinuous spiral vessels,
called by Link *vasa epidroïdæ fibrosa,* may be easily seen.

Function.—The function of the tissues of vegetables is not so varied as their forms have led botanists to suppose.

As a summary of these forms, we have, in the following. In the

simple cell we have the type of all the other tissues, and in

the lowest forms of plants it alone performs all the functions of the higher plants. The cell of the Ustilago
abominabilis is such a one. (Fig. 4.) By the continuous

attachment of these cells to one another, the changes that it fitting for becoming a part of the structure of the cell.

This is the process of nutrition. Within this cell another is generated, which is capable of performing the

same functions in the coils of trees and bushes armed with the changes that it fitting for becoming a part of the

structure of the cell. The cell is the part of the growth.

As we ascend in the scale of organization of plants, the

structure becomes more complicated. Cells are accumu-
lated together; some simply absorb sap, others expose the

sap to the atmosphere; whilst others separate peculiar

secretions, and another performs the functions of these secretions. As the functions of the plant become

more localised in the organs called leaves and flowers, tissues strong enough to bear them up in the air are

required in the coils of trees and bushes armed with an increase of thickness in their membrane, and woody

tissue is formed. Where the same objects are required, and at the same time space for a large quantity of fluid to

pass through the cells, fibre is generated within the mem-

brane; and for this reason fibro-cellular, and especially

fibro-vascular, tissues are found abundantly in ancient plants, and in those which require a large supply of mois-
ture. These tissues are absent or very small in dry plants, as well as those which are constantly immersed in water.

In the higher plants the conveyance of the prepared juices

is performed by another cell from the stem to the leaves, through the Laticiferous tissue. It is upon the cell of the

Dicotyledonous and Monocotyledonous plants that the

mysterious dynamic agency is exerted by another cell from

the anther, the result of which is the production of another plant, similar to the one from which it is deve-
loped. It will thus be seen that all the tissues of plants
take more or less of the functions of the simple cell,

which, as the fundamental form of vegetable organization,

is the prototype of all the other tissues. The plant may be not so much by a difference in the form as by a difference

in the function of particular cells that the complicated

organs of the highest plants are distinguished from one

another.

The principal works consulted in preparing this article
have been Meyen, Pflanzen-Physiologie, band i.; Link,

Elementa Philosophiae Botanicae; De Candolle, Organ-

ographie Vegetale; Lindley, Elements of Botany, and Intro-

pist, On the Spinal Cells of Asciuaceae, Linnean Trans-
actions, vol. 17, 1840; as also, some papers on Botani-
genesis, Müller's Archiv, 1838; Willshire, On Vegetable Structure, Annals of Natural History, vol. i.; Schueler,

Sur la Circulation dans les Plantes; Lancaster, On the


TITANIC ACID. [Titanium.]

TITÁNIUM. This metal was first recognised by

Mr. Gregor, in 1791, as a distinct substance; he detected it in

a black sand found in the bed of a rivulet near Menaccan

in Cornwall, which was named Titanite, 1785 Klemeth discovered it in another sand, the

titanium, and gave it the name it now bears. The properties of titanium were not however satisfactorily
determined until 1822, when Dr. Wollaston examined and described it as it occurred in its perfect metallic and crys-
tallized state, in the slag of an iron- furnace at Merthyl

Tydfil in South Wales. The form of the crystals is the cube; their colour resembles that of bright copper; they

are sufficiently hard to scratch rock-crystal, and their spe-
cific gravity is 5.3.

Titanium is not acted upon by nitric, hydrochloric, or sulphuric acid, either cold or hot, concentrated or diluted;

aqua regia, or nascent chlorine, is also powerless, but a mixture of nitric and hydrofluoric acid dissolves titanium;

from the fusion an extremely high tenacity is given to the metal when strongly heated with nitre, titanium is oxidized and rendered soluble in hydrochloric acid, and it is precipitated from solution by the alkalis in the state of a white oxide.

We shall now describe the principal mineral known to

contain titanium, except Pyroblore, Polyminities, Zirconia, &c., which are described under these heads.

Anatase, Oeuctedrite, or Osnatae.—This is protoxide of

titanium nearly pure. It occurs in attached and imbedded

minute octahedral crystals. Primary form a square prism.

Cleavage parallel to the terminal planes, and to those of

the octahedron. Fracture conchoidal, indistinct. Hard-
ness: scratches phosphate of lime, and is scratched by

quartz, being neverually broken. It becomes lustrous when heated gives out a reddish yellow phosphorescent light. Colour, various shades of brown, more or less dark, sometimes indigo blue. Streak white. Lustre adamantine, Translucent, transparent. Specific gravity 3.26.

It occurs in Cornwall, in Dauphy, at Bourg d'Oissia, in Spain, Switzerland, and some other places. It consists almost entirely of oxide of titanium, probably the protoxide.

B. Oen, or Titanite: Peroxide of Titanium, or Titanic Acid.—Ocurs crystallized and in crystalline masses. Primary form a square prism. Cleavage parallel to the lateral planes. Crystals frequently gencratulate. Fracture uneven. Hardness: scratchs quartz, being neverually broken. It becomes lustrous when heated gives out a reddish yellow phosphorescent light. Colour, various shades of brown, more or less dark, sometimes indigo blue. Streak white. Lustre adamantine, Translucent, transparent, opague. Specific gravity 4.29 to 4.4. Occurs not unfrequently inclosed in quartz, in fine red filamento-
s.
crystals. Rutile is found in Pershia, Bohemia, Switzerland, especially at St. Gothard, and in various other parts of Europe; and also in Brazil and North America. It consists of, according to H. Rose—oxygen; 9,93; titanium, 60.05. It is frequently more or less mixed with oxide of iron and of manganese, and sometimes with oxide of chromium.

Brookite—Probably a dimorphous variety of rutile. Occurs in attached crystals. Primary form a right rhombic prism. No cleavage parallel to the rhombohedra and short diagonal. Fracture uneven. Hardness: scratches fluor spar, and is scratched by phosphate of lime. Brittle. Colour, deep red, and reddish or yellowish brown. streak yellowish white. Lustre adamantine. Transparent, translucent, opaque. Specific gravity unknown. Occurs in Dauphiny and Switzerland, but in larger crystals at Snowdon in Wales. It has not been completely analyzed, but appears to be titanic acid with traces of iron and manganese.

The minerals which we shall next describe are the titanates of iron: they vary greatly both in form and composition, some being crystalized and others granular; the latter are frequently termed titaniferous iron-sand.


Imenite.—Occurs in imbedded crystals. Primary form a rhombohedron. No cleavage. Fracture uneven to conchoideal, with a vitreous lustre. Hardness 5 to 6; scratches glass slightly. Colour black. Opalescent. Specific gravity 8.63. It is found near Lake Ilmen in Siberia. Analysis by Maury—titanic acid, 48.92; protopide of iron, 37.87; protopide of iron, 10.74; protopide of manganese, 2.73; magnetism, 1.14.


Melosite.—Occurs in attached macle crystals. Primary form a rhombohedron. No visible cleavage. Fracture conchoideal, shining. Hardness: scratches glass readily. Brittle. Colour occasionally shows the magnetic properties. Streak black. Lustre metallic. Opalescent. Found in Dauphiny. It appears to be a titanite of iron, but has not been completely analyzed.

Of granular titanite of iron and titaniferous iron-sand, we have already mentioned three varieties.


Menacanite.—Occurs in small angular grains. Structure imperfectly isometric. Fracture fine-grained, uneven. Brittle. Colour black. Lustre glistening. Opalescent. Specific gravity 4.42. Found in rivulets in the parish of St. Keverne, Cornwall; it has also been found in New South Wales. The picked grains, analyzed by Dr. Colquhoun, gave—titanic acid, 87.67; protopide of iron, 30.78; protopide of manganese, 2.175.

Ivernine.—Occurs in very flatish angular grains, which have a rough glimmering surface. Structure lamellar. Fracture uneven to conchoideal. Very hard. Slightly attracted by the magnet. Opalescent. Lustre semi-metallic. Specific gravity about 4.5. Found on the Riesengebirge, near the origin of the river Isar in Silesia; in Bohemia; in the river Don in Scotland; and that of the Mersey opposite Liverpool. Colour greyish black. Lustre glistening. Opalescent. Specific gravity 4.37. Found in rivulets in the parish of St. Keverne, Cornwall; it has also been found in New South Wales. The picked grains, analyzed by Dr. Colquhoun, gave—titanic acid, 87.67; protopide of iron, 30.78; protopide of manganese, 2.175.

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Greenonite; Titania of Manganese.—Occurs in small amorphous masses and crystallized. Primary form probably an oblique rhomboide prism. Hardness, greater than that of fluor spar or phosphate of lime, but does not scratch glass. Colour deep rose red; the crystals are splenetic except the terminal faces, which are often dull and flat. Specific gravity 3.41. It is found in the manganese deposit of St. Marcel in Piedmont. Analysis: M. Caracari;—titanic acid, 74.5; oxide of manganese, 24.8.

Spheïre; Sphéïrinthe Silico-titanate of Lime.—Ocuurs as a detached and imbedded crystals, and massive. Primary form an oblique rhombic prism. Cleavage indistinct. Fracture even, slightly conchoidal. Hardness; scratches phosphate of lime, but is scratched by felspar. Occurs in the parishes of Saint-Malo, Sissach, and nearby. Colour grayish white. Lustre adamantine, translucent. Transparent, translucent, opaque. Specific gravity 3.8 to 3.6. Spheïre is found interspersed in primary rocks in granite and gneiss, and more particularly in syenite, Norway, Germany, Switzerland, and other parts of Europe. Results of the analysis of spheïre vary considerably. The following is by Klaproth;—titanic acid, 33; silicate, 65; lime, 33.

Aeschynite.—Titania of zirconium and cerium. It occurs crystallized. Primary form a right rhombic prism. Cleavage difficult, and only parallel to the basis of the primary form. Fracture conchoideal. Hardness; scratches phosphate of lime, and is scratched by felspar. Colour;—titanic acid, 56.4; cerium, 21.8; zirconium, 12.8. Specific gravity 5.14. Found at Misaak, in the Ural Mountains, Siberia. Analysis by Hartwell;—titanic acid, 50.6; zirconium, 20.8; oxide of cerium, 15.0; lime, 3.5; oxide of iron, 2.6; oxide of zinc, 0.3.

The principal natural sources of containing titanium being now described, we proceed to consider artificial compounds.

Oxygen and Titanium.—It has already been stated that these compounds are obtained by direct means. When rutile, or titanic acid, is dissolved in hydrochloric acid, a piece of zinc immersed in the solution occasions the liberation and precipitation of a deep purple-coated powder, which is, in other respects, identical with titanium. It has been determined that a porous mass of titanium can be formed when the solution returns to the state of pure titanium; but this cannot be collected; and hence the composition of the oxide has not been perfectly determined. It is here probably composed of—

| Equivalent | 32 |

When also titanic acid is exposed to a strong heat, a portion of it loses oxygen, and a black mass is formed, which is the protopide; it has an earthy fracture, is insoluble in water, and difficult to fuse. It has been already mentioned that anatase is probably the protopide of titanium.

Peroxide of Titanium, Titanic Acid.—Rutile is titanic acid nearly pure; when it is reduced to fine powder and fused in a crucible, it becomes a very light brittle mass. A carbonate of potash, titania of potash, obtained, mixed with some excess of carbonate of potash; this is to be removed by washing with water, and titanic acid is precipitated by dilution and heat; and after washing with dilute hydrochloric acid, is nearly pure titanic acid. Its properties are, that when pure it is quite white, very insoluble, and after it has been heated is soluble only in hydrochloric acid. Its acid powers are feeble; it is insoluble in alkalis, and does not act on stannous, however with alkaline and metallic oxides, forming salts, which are termed titanates. It is probably composed of—

| Two equivalents of oxygen | 16 |

| One equivalent of titanium | 24 |

| Equivalent | 40 |

Chlorine and Titanium combine when the gas is passed over metallic titanium at a red heat. It is a colorless, transparent fluid, and boils at a little above 212°, as volatile as an oxide of chlorine. On being exposed to air it deliquesces, and when a few drops of it are mixed with an equal bulk of water, combination takes place with considerable violence and the evolution of intense heat. It absorbs dry ammoniacal gas, and from the compound —
obtained Liebig prepared metallic titanium. It appears to consist of—

Two equivalents of chlorine 72
One equivalent of titanium 24

Equivalent ... 96

Tincture of galls, when added to a solution of titanic acid, occasions an orange-red colour, probably owing to the tannic acid which the tincture contains; this is very dear to be found, by the powder and a candle. The common acid of titanic acid are but little known; the peroxide, or titanic acid, unites both with bases and acids to form saline compounds: the former are called tannates.

TITANS (Tītānēs, fem. Tītānēs) is the name by which in the mythology of ancient Greece a certain class of sons and daughters of Uranus and Gaea are designated. The original name of Gaea was said to have been Tita, from which Titans was derived. (Diogenes Sir, ii. 60.) The beings generally comprised under the name of Titans were Oceanus, Coeus, Crius, Hyperion, Iapetus, Cronus, Theys, Rhea, Themis, Mnemosyne, Phæbe, Dione, and Theia.

(1) Apollod., Biblioth., i. 1, 3; Diodorus Sic., v. 66.) Other writers, as Stephanus of Byzantium (q. v. ‘Alexis, Pausanias (viii. 37, 3), and others, differ both in the names and numbers of the Titans. Uranus had by Gaea two other sets of children, viz. the Hecatoncheires (centamori, or beings with a hundred heads and limbs), and these two he cast into Tartarus, at which Gaea, their mother, was so indignated, that she induced the Titans to revolt against their father, Uranus, and gave to Cronus an adamantine club, which enabled him to secure the sovereignty and to maintain the enactors of the laws. (Apollod., Biblioth., i. 1, and 2.) The name Titan has also been given to those superhuman beings who were descended from the Titans, such as Pro- methus, Hecate, Latona, Pyrrha, Helios, &c. It moreover occurs as a designation of a very early race of men in Crete and Egypt.

(Lobeck, Aglaophones, p. 783.) Böttiger, Ideen zur Kenntniss der homerischen tithe. (Bibl., p. 217, &c.; Völker, Mythologie des homerischen Geschlechts, p. 260, &c.)

TITCHFIELD. [Hampshire, vol. xii., p. 32.]

TITHEs are the tenth part of the produce of all land, crops, hay, corn, and other things which are annually gathered. They are paid in kind, and there is no condition that they be not so paid. If the land is not brought in kind, the tithe must be paid in silver or gold. There is no tithe payable on land let to copyholders or tenants.

The tithe payable on land let to copyholders or tenants is what is known as the 'great tithe.' The 'small tithe' is the portion of the 'great tithe' which is paid by the copyholders or tenants to the landlord, and the 'large tithe' is the portion which is paid by the landlord to the parish.

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Tithes were all originally paid in kind, i.e. the tenth wheat-sheaf, the tenth lamb or pig, as the case might be, belonged of right to the parson of the parish as his tithe. The inconvenience and vexation of such a mode of payment are obvious. The procedure then was generally to have original payments made in kind at stated times and in countries in which barter formed the only means of exchange, and the products of the earth were the sole test of value. The improved habits and civilization of centuries were nevertheless unable to alter what was called the modus vivendi of medieval days, since the method of man, and no attempt had been made in this country, until very recently, to introduce a general improvement in the mode of collection. The inconvenience of paying tithes in kind must long since have been felt, and occasional pratis. Sometimes the owner of land would enter into a composition with the parson or vicar, with the consent of the ordinary and the patron of the living, by which certain lands should be altogether discharged from tithes, on conveying other land, or making compensation. In other words, the owner of the land purchased an exemption from tithes. Such arrangements between landowners and the church were recognised by law, but it was found that they were often injurious to the church for reason of an insufficient value being given for the tithes. The acts 1 Elizabeth, c. 10, and 13 Elizabeth, c. 10, were accordingly passed, which disabled bishops, colleges, chapters, parsons, and other clergy from alienating such property for a longer term than twenty-one years or three lives. In order to establish an exemption from tithes on the ground of a real composition, it is therefore necessary to show that such composition had been entered into before the statute of 1.27.; the exemptions have rarely been made, except under the authority of private acts of parliament.

Another method of avoiding the payment of tithes is that of a modus decrescendi, commonly known as a modus. This consists of any custom in a particular place, by which the ordinary mode of collecting tithes has been superseded by some special manner of tithing. In some parishes the custom has prevailed, time out of mind, of paying a certain sum of money annually for every acre of land, in lieu of tithes. In others a smaller quantity of produce is given, and the residue is made up in labour, as every 12th sheaf of wheat instead of the 10th, but to be housed or threshed by the owner. A large portion of the land of this country is tithe-free, from various causes. Some has been exempted under real composition, as already explained, and some by prescription, which supposes a composition to have been formed, at least, of frequent payments, so that the land once belonged to a religious house, and was therefore discharged in this manner. All abbots, priests, and other chief monks originally paid tithes from the lands belonging to them, until Pope Paschal II. exempted such lands in the act of 1.26. relatively of tithes, and allowed the lands to remain in their own hands. This general discharge continued till the time of King Henry II., when Pope Adrian IV., restrained it to the three religious orders of Cistercians, Templars, and Hospitallers, to whom Pope Innocent III. added the Premonstratenses. These four orders, on account of their exemption, were commonly called the privileged orders. The Council of Lateran, in 1215, further restrained this exemption to lands in the occupation of those religious orders, which were in possession of such lands. Bulls were however obtained for discharging particular monasteries from the payment of tithes, which would not otherwise have been exempt; by which means much land has been ever since tithe-free. Another mode by which lands belonging to religious houses became not liable to the payment of tithes, was that of unity of possession, as where the lands and the rectory belonged to the same establishment, which would not, of course, pay tithes, since the lands were not absolutely charged by this unity of possession, for upon any diminution the payment of tithes was revived; so that the union only suspended the payment. The act 31 Hen. VIII. c. 13, with the subsequent statutes of the reign of Edward VI., took away the discharge of their lands from tithes, though in the possession of the king or any other person. Many monasteries had previously been dissolved by act of parliament, but as no such clause as that contained in the 31 Hen. VIII. had been introduced into other acts, the lands of the monasteries dissolved by them became chargeable with tithes.

We have stated enough concerning the nature and the various circumstances affecting them, to show a simplified method of supporting a religious house, in which the interests of different parties who had to pay or to receive them. But apart from such considerations it may be to inquire whether tithes be, in their original nature, a mode of supporting a religious house, which might be made as. This surely be a doubt that the payment of tithes is a kind of cause of constant irritation and dispute between a clergyman and his parishioners. With the best motives on both sides of the question, many long and difficulties must arise between them; and even there is no doubt, the form and principle of payment is odious and discouraging. The hardships and expenses of tithes upon the agricultural are well described by F. Haley:—"Agriculture is discouraged by every conceivable new rate of landed property which lets in those who have an interest in the improvement to a participation of the part of all institutions which are in this way adverse to or necessary for the improvement of so numerous, and tithes. A claimant here enters into the produce which is tributed to provide a remedy for these evils. But tributes are, like any other tax, which being found injurious to the state, may be removed on particular grounds. Thus the property of the state, but of its subjects; they are paid not only to the church, but to lay impro priators; they have been the subject of innumerable private lawsuits; land has been sold at a higher price on account of its exemption from tithes; the value of the patronage of the great church in the livings of this county is dependent upon the vexation of liability to tithes; in short, the various relations of society have been for centuries so closely connected with the receipt and payment of tithes, that those who have absorbed them would have been a gross injustice to other countless, and no advantage to the community; for the state would immediately have been enjoyed by those large lands were discharged from payments to which they had always been subject to which they had in all probability been purchased.

As for these reasons the extinction of tithes was unprovable, a commutation of them has been attempted in this country, without success. F. Haley, who writing in the year 1799, observes of this experiment:—"No measure of such extensive concern as to him so practicable, NOR ANY SINGLE ALTERATION SO BENEFICIAL, AS THE CONVERSION OF TITHES INTO COMMISSIONS; I AM CONVINCED, MIGHT BE NO ADJUSTMENT TO THE TITE-HOLDER A COMPLETE AND SUFFICIENT JUSTIFICATION FOR HIS INTEREST, AND TO LEAVE TO INDUSTRY ITS FULL REWARD." The commutation of tithes occasioned by this appropriation of taxes had become so general, that a commutation was made absolutely necessary for the safety of the church itself. It was recommended by committees of both Houses of Parliament in 1822 but not finally carried into effect till 1838.

The statutes for the general commutation of tithes in England are the 6 & 7 W. IV. c. 71. the 7 W. IV. and Vict. c. 63. the 6 & 7 Vict. c. 64. the 2 & 3 Vict. c. 52. and the 6 & 7 Vict. c. 56. It is a statute a rent-charge payable in money, but prisoners have been fixed according to the average price of corn for seven previous years, for all tithes, whether payable under a rent-charge, composition, or not. A voluntary agreement between
the owners of the land and of the tithes was first promoted, and in case of no such agreement, a compulsory commutation was to be effected by which barley, and oats. In case of dispute, provision was made for the valuation and apportionment of tithe in every parish. The rent-charge was to be thus calculated:—The compotter of corn returns is required to publish in January the average price of the harvest of barley and oats, computed from the weekly averages of the corn returns during seven preceding years. Every rent-charge is to be of the value of such number of imperial bushels and decimal parts of an imperial bushel as the tithe of a parish has been settled by agreement, or by award at 300l., and that the average price of wheat for the seven preceding years had been 10s. a bushel, of barley 5s., and of oats 2s. 6d.; the 300l. would then represent 200 bushels of wheat, 400 bushels of barley, and 800 bushels of oats. However much the average prices of corn may fluctuate in future years, a sum equal in value to the same number of bushels of each description of corn, according to such average prices, will be payable to the tenant or lessee at the end of each year, and the quantity of corn is fixed, but the money payment to the tithe-owner varies with the septennial average price of corn. Land not exceeding 20 acres may also be given or sold to the tenant or lessee, who, by agreement, may be made to pay a rent-charge in lieu of a tithe, as a commutation for tithes to ecclesiastical persons, but not to lay improvers. (6 & 7 Will. IV., c. 71, s. 25-28.)

By the last Report of the tithe commissioners, it appears that already voluntary proceedings have commenced in 3381 tithe districts; 6348 agreements have been received, of which 5804 have been confirmed; 2178 notices for making awards have been issued; 1353 drafts of compulsory awards have been received, of which 1000 have been confirmed; 5220 apportionments have been received, of which 4347 have been confirmed. Of the whole business of assigning rent-charges and apportioning them, about half is completed. The complete and final commutation of tithes must be regarded as a most valuable measure. It is perfectly fair to all parties, and is calculated to add security and permanence to the property of the church, and to remove all grounds of discord and jealousy between the clergy and their parishioners. Nor must we omit to mention an improvement in the mode of recovering tithes, consequent upon the commutation. There were formerly various modes of recovery, in the ecclesiastical as well as in the civil courts, and the process was so slow and tedious, as to cause much complaint and hardship. The present mode of recovering the rent-charge, if in arrear, is by distraint for it in the same manner as a landlord recovers his rent; and if the former has been forty years in arrear, the possession of the land may be given to the owner of the rent-charge until the arrears and costs are satisfied. Indeed the whole principle of the tithes commutation Act is to strip tithes of the character of a tax, and to assimilate them as much as possible to a rent-charge upon the land.

[Agriculture; Benefice; First-Fruits; Improprations; Tax, Taxation; Taxatio Ecclesiastica; Tenths.]—The territory from the Starno, to the Ogmore, is an antient municipal division of land in England, and was consecrated by Saxon kings. The whole country was divided into tithings and hundreds by Alfred the Great. The former was a district containing ten heads of families; the latter comprised ten tithings, or one hundred heads of families. Every tithing had its chief man annually appointed to preside over the rest, who was called the tithing-man or boatholder, and sometimes the headborough or borough's elder. Each of the tithings was bound to keep the peace within their own jurisdiction, and the members were responsible for each other. So important were these associations deemed to be, that no man was allowed to abide in England above forty days without being enrolled in some tithing. The communication has long ceased; the district and division are still retained in many parts of England.

TITI, SANTI DI, an Italian painter and architect, born of a noble family at Borgo San Sepolcro in Tuscany, 1538, was a scholar of Bronzino's, and, according to Lanzi, also studied under Cellini. While at Rome he was employed upon some subjects of the church of San Lorenzo, and painted a St. Jerome in San Giovanni de' Fiorentini, besides executing several works in the Belvedere of the Vatican. He returned to Florence in 1566, with a reputation for great ability; and now that such reputation at all diminished by the works he there produced, though there are some of his best, including his Resurrection and Supper at Emmaus, in Santa Croce; of which, and of his other performances, a full account is given by Borghini, in his "Lives of the Artists." He had obtained by his供养 his profession of architect. The Casa Dardanelli, the Villa Spinzi at Peretola, and his own house at Florence, are enumerated among his works of that class, but without much commendation; although he is said to have displayed great talent in some of his architectural backgrounds in painting, in which he also showed great knowledge of perspective. His pencil was frequently employed on merely temporary decorations, either on occasions of solemn funeral obsequies or splendid festivities, of which latter kind were those which he painted at the celebration of the nuptials of the duke of Bracciano. Santi died in 1603, leaving a son named Tiberio, who was also an artist, and who did not long survive him.

(Boi. Unr. Test. Liv. Ill. Vass.)

TITIAN. [Vicellio, Tiziano.]

TITICA CA. LAKE. [Bolivia, vol. v., p. 86.]

TITLARKS. Mr. Swainson classifies the Titlarks (genus Anthus) as different species of birds, having the plumage and long hinder toes of the true Larks, and the slender bills of the Wagtails; and he places the former next to the East Indian genus Enicurus, which in his view succeeds to the Wagtails (Motacilla and Buphagus). Anthus indeed seems to him to have its position at the very extremity of the Prenotrotas, just as the family of the Alaudinæ, or True Larks, is in the circle of the Coniopteryges; in other words, they are not only analogous, but this analogy actually blends into another (Classification of Birds. [Larks.]) In the Synopsis, at the conclusion of the work, Anthus is arranged as the last genus of the Motacillina, with the following Generic Character.—Bill very slender, the sides compressed, the upper mandible longest, with the tip deflected over the lower, and distinctly notched. Wings moderate; the four first quills nearly equal: tertials obtuse, lengthened. Tail moderate, slightly forked. Legs slender, black. Tarus and middle toe equal. Lateral toes and claws of the same length. Size. Example. Anthus australis (Fauna Boreali-Americana, pl. 44.). The Prince of Canino also places the genus Anthus among the Motacillinae, which, in his arrangement, is the sixth subfamily of the Turdidæ.

The True Larks are placed by the Prince, in the same highly useful work (Birds of Europe and North America), under the Alaudinæ, the fourth subfamily of the Fringillides, standing between the Emberizæ and the Leisines.

The Alaudinæ of the Prince comprise the following Genera.—Certhiaulida, Sw.; Alauda, Linn.; Galeria, Boie; Phileremos, Brehm (Eremophilus, Boie); and Melocorypha, Boie. Mr. Gray (List of the Genera of Birds) also makes Anthus one of the genera of his Motacillinae, placing it between Ephythiaria, Gould, and Corydallia, Vigors. The Motacillinae, in Mr. Gray's arrangement, form the seventh subfamily of his Losauriformes.

The True Larks (Alaudinæ) are arranged by him as the sixth subfamily of the Fringillides, with the following Genera.—Alauda, Linn.; Galeria, Boie; Otocoris, Bonap.; Melanocorypha, Boie; Sizalida, Less.; Erana, G. R. Gray; Mirafra, Horst.; Calandra, Kaup; Fringalauda, Hodg.; Megalophonous, G. R. Gray; Macronsy, Sw.; and Certhiulida, Sw.

The Alaudinæ are placed by this zoologist between the Emberizæ and the Leisines.

But we must now return to the Titlarks, and we quite agree with Mr. Yarrell, who, in his British Birds, observes that it would assist correct definition if, among ourselves, the term Titlark could be discontinued entirely; * the Tree

* In the Appendix Mr. Gray states that Picateria, Kapp, and Leiopteryx, should come next to Anthus, and that Mr. Swainson's genus Agromyza should be placed here,
Pipit being called the Titlark by some, the Meadow Pipit a Titlark by others; and round the sea-coast, where the Rock Pipit is generally the most frequent of the three, that is also called Titlark.

Bechstein separated the Pipits from the true Larks, giving the former the generic appellation of Anthus, and Mr. Yarrell elevates them into a family, Anthidae.

The following species are British:—

The Tree Pipit, Anthus trivialis; the Meadow Pipit, Anthus pratensis; the Rock Pipit, Anthus obesus (Anthus petrosus, Flem., Jen.; Anthus aquaticus, Selby, Gould; Alauda obesus, Aust.); and Richard's Pipit, Anthus ricardi.

The Titlark of Pennant is the Meadow Pipit of the above list; and Mr. Yarrell well observes that scarcely any two British birds have been so frequently confounded together as the Tree and the Meadow Pipits; but when the two species are examined in hand, obvious and constant distinctions appear; and there are, he adds, besides, differences in the habits of these birds, as well as in the localities they each frequent. 'The Tree Pipit is rather the larger bird of the two; the beak is stouter and stronger; the spots on the breast longer and fewer in number; the claw of the hind toe is not so long as the toe itself; the external feathers of the wings are rather longer in proportion to the primaries; the white on the outer tail-feather on each side is neither so pure in colour, nor is it spread over so large a portion of the feather; and, as far as my own observation goes, it does not appear to be so numerous as a species as the Meadow Pipit.'

Unlike the Meadow Pipit, the Tree Pipit is a summer visitor, only arriving in our well-wooded enclosures towards the end of April. The male generally begins his agreeable song from the top of a bush or an upper branch of some 'hedge-row elm; from his perch he rises into the air, his wings shivering, till he has reached an elevation about as high again as the tree from which he started. As soon as he has attained his greatest height he poises his wings, spreads his tail and slowly descends, singing all the while, to the same station whence he rose, or the top of some neighbouring tree. The nest, placed generally on the ground, is framed of moss, root-fibres, and withered grass, lined scantily with bents and hairs. The eggs, four or five in number, vary much in colour in different nests.

Mr. Yarrell considers the most characteristic hue of greyish-white clouded and spotted with purple-brown, purple-red; the length of the egg about 10 lines, class B. Food, insects and worms. Total length of the about 6½ inches. This bird must not be confounded with the Wood-Lark.

The winter-quarters of this species are probably Northern and Western Africa. It is a Madeira bird, also inhabits Japan.

The Meadow Pipit remains with us throughout the year and is the smallest and most common species, its length being 6 inches only. It haunts heaths and heath districts, as well as meadows and marsh-lands. Mr. Yarrell thus describes its habits:— When progressing to place to place, the flight of this bird is performed by unequal jerks; but when in attendance on its mate, undisturbed, it rises with an equal vibratory motion, sings some musical soft notes on the wing, sometimes hovering over its nest, and returns to it after singing. Occasionally it may be seen to settle in a low bush; but is rarely observed sitting on the branch of a tree, or perched on a wall, which is the common station of the Tree Pipit. The Meadow Pipit, when standing on a slight mound of earth, a clod, or a stone, frequently raises its tail up and down, like a wagtail; and Mr. Nelson mentions he has heard him sing when perched on or very near the earth. The Meadow Pipit seeks its food on the ground, along which it runs among pursuit of insects, worms, and small grubs. In the nests of one of these birds, examined in the month of December, Mr. Thompson, of Belfast, found two specimens of Anthus lubricus. It is, according to the late-named naturalist, the Moos-cheeper of the north of Ireland, a name which Sibbald gives as applied to it in Scotland.

Nest on the ground, generally among grass, under dried bents on the outside, with a lining of finer grass and few hairs: eggs from four to six, reddish brown mixed with darker; length nine lines by seven.

Pennant gives Cor Hedydd as the Welsh name of the Titlark, and Hedgydd y Gae as that of the Field-lark, Alauda minor.

Foot of Meadow Pipit. (Yarrell.)

Foot of the Tree Pipit. (Yarrell.)

End of Volume the Twenty-Fourth.