

return to bed, and when they are awake they have no recollection of any of these occurrences. Sometimes the actions performed are of a complicated character and bear some relation to the daily life of the sleeper. Thus a cook has been known to rise out of bed, carry a pitcher to a well in the garden, fill it, go back to the house, fill various vessels carefully and without spilling a drop of water, then return to bed, and have no recollection of what had transpired. Again, somnambulists have been observed to write letters or reports, execute drawings, and play upon musical instruments. Frequently they have gone along dangerous paths, executing delicate movements with precision. Four types of somnambulist may be noticed,—(1) those who speak without acting, a common variety often observed in children and not usually considered somnambulist; (2) those who act without speaking, also well known and the most common type; (3) those who both act and speak, more exceptional; and (4) those who both act and speak and who have not merely the sense of touch active but also the senses of sight and hearing. The fourth class is the most extreme type and merges into the physiological condition of mesmerism or hypnotism. This peculiar condition has already been fully described under animal magnetism (see MAGNETISM, ANIMAL), and it is necessary here only to notice it in connexion with the subject of sleep. Many observations indicate that, at all events in some cases, the somnambulist, engaged, for example, in writing, has a mental picture of the page before him and of the words he has written. He does not see what he really writes. This has been proved by causing persons to write on a sheet of paper lying on the top of other sheets. After he has been allowed to write a few sentences, the sheet was carefully withdrawn and he continued his writing on the next sheet, beginning on the new sheet at the corresponding point where he left off on the first one. Moreover, the somnambulist, by force of habit, stroked t's and dotted i's at the exact places where the t's and i's would have been had he written continuously on one sheet, showing that what he was conscious of was not what was before him but the mental picture of what he had done.

The following table, modified from two such tables given by Ball and Chambard in their exhaustive article "Somnambulisme" in the *Dictionnaire Encyclopédique des Sciences Médicales*, shows the relation of the various intermediate conditions of sleeping and awaking and of the dreaming and somnambulist states. The horizontal stroke indicates the presence of the condition the name of which heads the column:—

	Organic Life.	Consciousness.	Imaginative Faculties.	Co-ordinating Faculties.	Power of Movement and Sensibility.
Normal waking state	—	—	—	—	—
Sleep, 1st degree	—	—	—	—	—
" 2d degree	—	—	—	—	—
" 3d degree	—	—	—	—	—
Deep sleep	—	—	—	—	—
Waking, 1st degree	—	—	—	—	—
" 2d degree (specially dreaming state)	—	—	—	—	—
" 3d degree	—	—	—	—	—
Complete waking	—	—	—	—	—
Dreaming state	—	—	—	—	—
Ordinary somnambulism—(2) above	—	—	—	—	—
Profound somnambulism (perfect unconsciousness)	—	—	—	—	—
Somnambulist dream (movements in a dream)	—	—	—	—	—

The somnambulist acts his dream. His condition is that of a vivid dream in which the cerebrum is so active as to influence centres usually concerned in voluntary movements. Under the dominant idea he executes the movements that this idea would naturally excite in the waking state. Many of his movements are in a sense purposive; his eyes may be shut so that the movements are executed in the dark, or the eyes may be open so that there is a picture on the retina that may awaken no consciousness, and yet may, by reflex mechanisms, be the starting-point of definite and deliberate movements. In many cases he does not hear, the auditory centres not responding; but in others suggestive words may alter the current of his dream and lead him to perform other actions than what he intended to do. On awaking there is either no memory of what has taken place or the dim recollection of a fading dream.

It is important to notice that there is scarcely any action of which a somnambulist may not be capable, and immoral acts from which the individual would shrink in waking hours may be performed with indifference. Considering the abrogation of self-control peculiar to the physiological condition, it is evident that no moral responsibility can be attached to such actions. In cases where somnambulist propensities place a person in danger, an endeavour should be made to induce him to return to bed without awaking him; as a rude awakening may produce a serious

shock to the nervous system. Inquiry should then be made into the exciting cause of the somnambulist dream, such as a particular train of thought, over-excitement, the reading of special books, the recollection of an accident or of a crisis in the person's history, with the view of removing the cause if possible. It should never be forgotten that somnambulism, like chorea, hysteria, and epilepsy, is the expression of a general morbid predisposition, an indication of a nervous diathesis, requiring careful treatment so as to avoid more dangerous maladies.

See article "Sommeil" in the *Dictionnaire Encyclopédique des Sciences Médicales*, where a full bibliography is given and where also there is an account of the medico-legal questions connected with sleep and somnambulism; Macnish, *Physiology of Sleep*; Durham, "On the Physiology of Sleep," in *Gay's Hospital Reports*, 1860; Kohlschütter, "Die Mechanik des Schlafes," in *Z. f. ration. Med.*, vol. xxxiii., 1869; Pfleger, "Theorie des Schlafes," in *Pflüger's Archiv*, vol. x., 1875; Mosso, *Ueber den Kreislauf des Blutes im menschlichen Gehirn*, Leipsic, 1881. As to somnambulism, see the article on the subject in the *Dictionnaire* both for full details and a copious bibliography. (J. G. M.)

SLEIDANUS, JOHN (c. 1506-1556), the annalist of the Reformation, was born at Schleiden (now a small village in the Oleffthal, about 42 miles south-west of Cologne) in 1506 or 1508. Passing from the village school, he studied at Liège, Cologne (?), Louvain (where he became tutor to the son of Count Manderscheid of Schleiden), Paris, and Orleans (where he studied law). In 1536 he became secretary to Cardinal du Bellay, minister of Francis I., and spent five years with him and with his brother Cardinal Guillaume du Bellay. The cardinals Du Bellay belonged to that party among the French nobility who desired on political grounds an alliance between the German Protestants and Francis against the emperor Charles V., and who employed the leaders of the Strasburg citizens as intermediaries. Sleidanus, whilst among the humanists of Liège, had adopted Protestant opinions, had learned to distrust the Romanist policy of Charles V., and was himself a strong supporter on religious and political grounds of the plans of the brothers Du Bellay. Their confidence in him was such that he was sent (1540) to watch the conduct of the French ambassador at Hagenau, and this brought him into personal relation with the German Protestant leaders. Next year Du Bellay sent him to confer with the heads of the Schmalkaldic League, when he found his patron's ideas unacceptable. Philip of Hesse and the elector of Saxony would make no alliance with a foreign power against the emperor, and distrusted Francis personally because of his persecution of French Protestants. It is possible that this news made Du Bellay feel that he had no further need for his secretary, for we find Sleidanus leading a wandering life for two years, and finally making Strasburg his home, although he still kept up a political correspondence with France. Sleidanus had been accustomed to copy all documents bearing upon the Reformation to which he had access, and Bucer, who had seen his collection, proposed to Philip of Hesse to appoint him historian of the Reformation, giving him a salary and access to all necessary documents. After some delay the heads of the Schmalkaldic League agreed to Bucer's proposal, and Sleidanus began his great work and finished the first volume in 1545. In that year he was again recalled to diplomacy and went to England in a French embassy to Henry VIII. While there he diligently collected materials for his history. On his return to Strasburg he was sent by that city as one of its representatives to the diets of Frankfort and Worms; and thence he proceeded to Marburg to explore the archives of Philip of Hesse. The Schmalkald War interfered with this work and also prevented the payment of Sleidanus, who in his difficulties applied to England for aid, and at Cranmer's intercession received a yearly pension (not long continued) from Edward VI. In 1551 Sleidanus went to the council of Trent as representative from Strasburg, charged also with full powers to act for the imperial cities Esslingen, Ravensburg, Reutlingen, Biberach, and Lindau. On his return his friends got him appointed professor of law in Strasburg, and he was once more able to give his whole attention to his great work, which he finished for the press

in 1554. But want of money, the death of his wife—whom he had married in 1546 on his return from the diet of Frankfort—and other misfortunes compelled him to delay printing. The book at length appeared,—*Commentarium de statu religionis et reipublice, Carolo V. Cesare, Libri XXVI.* (translated into English by John Daws in 1560 and by G. Bohm in 1689). But the troubles of Sleidanus were not ended. The work was too impartial to please any one, and even the gentle Melancthon was unable to praise it. It remains notwithstanding the most valuable contemporary history of the times of the Reformation, and contains the largest collection of important documents. The author died at Strasburg in October 1556 in poverty, and inconsolable since the death of his wife.

See H. Baumgarten, *Ueber Sleidanns Leben und Briefwechsel* (1878), and *Sleidanns Briefwechsel* (1881).

SLIGO, a maritime county in the north-west of Ireland, in the province of Connaught, is situated between 53° 54' and 54° 28' N. lat. and between 8° 10' and 9° 10' W. long., and is bounded N. by the Atlantic, E. by Leitrim, S.E. by Roscommon, and S. and W. by Mayo. The total area is 451,129 acres, or nearly 705 square miles. Its greatest length from north to south, between Mullaghmore Head and Lough Gara, is 38 miles and its greatest breadth from east to west is 41.

The coast-line is very irregular and in some places rises into grand escarpments and terraces. The principal inlets are Killala Bay and Sligo Bay, the latter subdivided into Brown Bay, Drumcliffe Bay, and Ballysadare Bay. Near the coast are the islets of Inishmurray, Coney, and Oyster. Though Sligo cannot be compared for scenery with the western parts of Mayo, it is in many places charmingly picturesque, being well wooded and possessing several fine lakes and rivers, as well as some ranges of hills which from their situation and grouping have a very striking effect. In the north are the limestone elevations of Benbulbin (1722 feet) and Knocknarea (1078), contrasting finely with the adjacent rugged gneiss mountains, among which are King's Mountain (1965 feet) and Gullagherboy (1430). In the west are the ranges of the Slieve Gamph and Ox Mountains, 1300 and 1600 feet respectively. The Curlew Mountains (nearly 900 feet high) separate Sligo from Roscommon. The principal rivers are the Moy, forming for a part of its course the boundary with Mayo, and flowing south-westwards and then northwards into Killala Bay; the Easky, flowing northwards from Lough Easky; the Ballysadare, with its branches the Owenmore, Owenbeg, and Arrow or Unshin; and the Garvogue, flowing from Lough Gill. Except the finely situated Lough Gill (3130 acres) extending into Leitrim, Lough Arrow (3010), and Lough Gara (3683), none of the lakes have so large an area as 400 acres.

The Carboniferous Mountain Limestone forms the basis of a great part of the county, and includes the Lower Limestone calp or black shale series and the Upper Limestone, which rises occasionally into a lofty tableland. There is a small tract of Yellow Limestone in the extreme north, as also on the north and north-east of Lough Gara, whence it extends into Mayo. The Old Red Sandstone appears in two masses near Lough Arrow. A small tract of granite enters the county on the south-west, coming from between Lough Conn and Foxford in Mayo, giving place to a broad belt of trap porphyry bounded by a narrow fringe of Old Red Sandstone, which stretches in a north-easterly direction along the line of the Ox Mountains to Ballysadare Bay. Iron is abundant, especially in the neighbourhood of the Ox Mountains, but from want of fuel is not worked. Pure copper is found in the beds of some of the rivers, and sulphate of copper and iron pyrites occur in some places.

Agriculture.—There is considerable variety both in the character of the soil and in the agricultural advancement in different parts of the county. In some parts it is a light sandy loam resting on a freestone bottom, and in the lower districts a rich and deep mould prevails resting on a substratum of limestone. Owing to the moistness of the climate cattle feeding is found to be the most remunerative method of farming. Out of a total of 451,129 acres

231,753 or 51.3 per cent. in 1884 were under grass, 86,365 under crops, 38,431 bog and marsh, 70,599 barren mountain land, 7577 woods and plantations, and 417 fallow, the remaining 16,987 acres being under water, roads, fences, &c. The total number of holdings was 15,352, there being 752 under 1 acre, 1443 between 1 and 5 acres each in extent, 5834 between 5 and 15, 4592 between 15 and 30, 1520 between 30 and 50, and 1211 of 100 acres and upwards. The total area under corn crops in 1884 was 24,324 acres, while in 1875 it was 30,810; under green crops 25,897, in 1875 30,491; under meadow and clover 36,120, in 1875 32,396; and under flax 24, in 1875 175,—the total area under tillage having decreased between 1875 and 1884 from 93,872 to 86,365 acres. Of the corn crops in 1884 oats occupied 23,055 acres, and green crops and potatoes 19,335. The number of horses between 1875 and 1884 increased from 7244 to 8292, of asses from 7588 to 8471; cattle decreased from 97,658 to 89,458, sheep from 65,857 to 64,324; pigs, again, increased from 19,726 to 26,996, goats from 3081 to 4745, and poultry from 277,113 to 305,509. According to the landowners return Sligo was divided among 856 proprietors, possessing 448,397 acres at an annual value of £210,382, or about 9s. 4½d. per acre. The principal proprietors were Colonel E. H. Cooper, 34,120 acres; Sir Robert Gore Booth, 31,774; Charles W. O'Hara, 21,070; W. R. O. Gore, 21,019; Owen Wynne, 12,982; Colonel King-Harman, 12,629; Hon. Evelyn Ashley, 12,426; and William Phibbs, 10,507.

Manufactures and other Industries.—Coarse woollens and linens are manufactured for home consumption, and there are tanneries, distilleries, and breweries in the principal towns. A considerable general trade is carried on at the ports of Ballina (on the Moy) and Sligo. The fisheries on the coast are valuable, and there are important salmon fisheries at the mouths of the rivers.

Administration and Population.—The county is divided into 6 baronies, and contains 37 parishes and 4 parts of parishes, and 1292 townlands. The county has three poor-law unions—Dromore West, Sligo, and Tobercurry—with parts of the unions of Ballina and Boyle (Roscommon). It is in the Connaught circuit, and assizes are held at Sligo and quarter sessions at Ballymote, Easky, and Sligo. It is in the Dublin military district, and there are barracks at Sligo. For parliamentary representation the county has since 1885 formed two divisions (North and South), each returning a member. Between 1841 and 1851 the population decreased from 180,886 to 128,515 or 29 per cent., and by 1881 it had decreased to 111,578 (55,144 males, 56,434 females), or 38.3 per cent. since 1841. In 1881 the number of persons who could read and write was 52,602, who could read only 15,574, who could neither read nor write 43,402. There were 2326 who could speak Irish only, while 24,263 could speak Irish and English. There were 10 superior schools with 266 pupils, of whom 142 were Catholics and 124 Protestants, and 211 primary schools with 13,714 pupils, of whom 12,070 were Catholics and 1644 Protestants. The principal towns are Sligo (population 10,808 in 1881), Ballina (1442 in Sligo and 4318 in Mayo), Ballymote (1145), and Tobercurry (1081).

History and Antiquities.—In the time of Ptolemy the district was inhabited by the *Nagnatae*, the capital *Nagnata* being somewhere near the site of the present town of Sligo. Afterwards it was possessed by a branch of the O'Connors, called O'Connor Sligo. On the landing of Henry II. it gradually fell into the power of the De Burgos. The district formed part of Connaught, which, in the reign of Elizabeth, was divided into seven counties. On the lands of Carrowmore, between Sligo and Ballysadare, there is a remarkable collection of Druidical remains, consisting of cairns, a circle, cromlechs, and pillar stones. At Drumcliffe is the only round tower now remaining in the county, and a beautiful Celtic cross 13 feet in height. The principal monastic ruins are the abbey of St Fechan at Ballysadare, with an ancient church displaying some curious architecture of the 11th or 12th century; the remarkable group of buildings on Inishmurray; and the abbey of Sligo, noticed under the town below. There are a considerable number of old castles, but none of special interest.

SLIGO, the chief town of the above county and an important seaport, is finely situated at the mouth of the Garvogue, near Lough Gill, 137 miles north-west of Dublin by rail. The town is rather irregularly built and has a decayed appearance, which somewhat belies its actual prosperity. Formerly it was fortified by a castle and walls, but of these there are now no remains. The abbey, founded in 1252 by Maurice Fitzgerald, lord-justice, is one of the finest monastic ruins in Ireland. It was partly destroyed by fire in 1414 and again in 1642. Within recent years measures have been taken to preserve it. Three sides of the cloister of the quadrangle still remain, and the lofty quadrangular tower at the junction of the nave and chancel is entire. The eastern window, still very perfect, is of the date of the original structure. The

principal modern buildings are the new Catholic cathedral, in the Norman style with a finely sculptured doorway, the town-hall (1865-66), the county court-house, the custom-house, the lunatic asylum, and the barracks. The quays are commodious, and steamers ply to and fro between Sligo and Glasgow, Liverpool, and Londonderry,—the principal exports being cattle, fowls, eggs, and butter, and the imports coal, iron, timber, and provisions. The port is under the control of harbour commissioners. There is an important butter-market, and maize, flour, and corn mills. The population in 1861 was 10,693, and in 1881 it was 10,808.

A castle was built at Sligo by Maurice Fitzgerald in 1242, which in 1270 was taken and destroyed by O'Donnell; in 1310 it was rebuilt by Richard, earl of Ulster, and was again partly destroyed in 1369 and 1394. Early in the reign of James I. the town received a market and two annual fairs; in 1613 it was incorporated and received the privileges of a borough; and in 1621 it received a charter of the staple. In 1641 it was besieged by the Parliamentary forces under Sir Charles Coote, but was afterwards evacuated, and occupied by the Royalists till the termination of the war. In 1688 it declared in favour of James II., and, after being captured by the Enniskilleners, was retaken by General Sarsfield, but ultimately surrendered to the earl of Granard. The borough was disfranchised in 1870.

SLIVEN, SLIVNO, SELIMNIA, ISLEMNIYE, or ISLIMYE, an important town of East Roumelia, situated at the southern base of the Balkans, 750 feet above the sea, where several mountain streams flow south to the Tunja, a tributary of the Maritza. The luxuriant foliage of its trees and the general picturesqueness of its appearance gain in effect by the contrast which they present with the bare gneiss and porphyry summits that rise immediately to the north. On the south it is surrounded by orchards, gardens, and extensive mulberry plantations. Besides a large number of mosques, the public buildings comprise a synagogue and four Christian churches; but there is nothing of much architectural interest in the town. A Government factory for the manufacture of military clothing was established in 1834; there is a good silk industry; and Sliven red wine is famous. The population (Turks, Bulgarians, Armenians, Greeks, Jews, and Gipsies) was 22,000 in 1872.

Sliven, the Stifanos of the Byzantine writers, owes a good deal of its importance to its strategical position on one of the trans-Balkan highways to Adrianople and the south. In early times, when it was a subject of dispute between Byzantium and Bulgaria, it generally followed the fate of Aidos and Mesembria (Misivri). After its capture by the Turks (1388) it was one of the "voynik" towns which remained exempt from taxes and were allowed to elect their own voivode; but those privileges were lost in the 16th century. On 12th August 1829 Sliven was occupied by the Russian army under Rüdiger and Gortchakoff.

SLOANE, SIR HANS (1660-1753), a celebrated collector and successful physician, was born on 16th April 1660 at Killileagh in county Down, Ireland, where his father had settled at the head of a Scotch colony sent over by James I. He had as a youth a strong turn for collecting objects of natural history and other curiosities. This led him to the study of medicine, which he went to London to pursue, directing his attention assiduously to botany, materia medica, and pharmacy. His collecting propensities made him useful to the more philosophically minded Ray and Boyle, and procured him their patronage. After four years in London he travelled through France, spending some time at Paris and Montpellier, and taking his M.D. degree at the university of Orange. He returned to London with a considerable collection of plants and other curiosities, of which the former were sent to Ray and utilized by him for his *History of Plants*. Sloane was quickly elected into the Royal Society, and at the same time he had the good fortune to attract the notice of Sydenham, who took a fancy to him and gave him valuable introductions to practice. In 1687 he became fellow of the College

of Physicians, and took the opportunity of proceeding to Jamaica the same year as physician in the suite of the duke of Albemarle. The duke died soon after landing, and Sloane's visit lasted only fifteen months; but during that time he got together about 800 new species of plants, the island being at the time virgin ground to the botanist. Of these he published an elaborate catalogue in Latin; and at a later date (1707-25) he made the experiences of his visit the subject of two sumptuous folio volumes. His merits as a collector were sufficient to give him a high place in the scientific circles of the time. He became secretary to the Royal Society in 1693, and edited its *Transactions* for twenty years. His practice as a physician among the upper classes was large and lucrative; he is said to have inspired the members of the court and aristocracy with the "greatest confidence in his prescriptions." In the pamphlets written concerning Dr Cockburn's sale of a secret remedy for dysentery and other fluxes, it was stated for the defence that Sloane himself did not disdain the same kind of professional conduct; and there is some colour given to that charge by the fact that his only medical piece, an *Account of a Medicine for Soreness, Weakness, and other Distempers of the Eyes* (London, 1745) was not given to the world until its author was in his eighty-fifth year, and had retired from practice.

On the accession of George I. Sloane was made physician-general to the army, and in 1716 was created a baronet, being the first medical practitioner to receive an hereditary title. In 1719 he became president of the College of Physicians, and held the office sixteen years. In 1727 he succeeded Sir Isaac Newton in the presidential chair of the Royal Society; he retired from it at the age of eighty, "much against the inclination of that respectable body, who chose Martin Folkes to succeed him, and in a public assembly thanked him for the great and eminent services which he had rendered them." Sloane's memory survives more by his judicious investments than by anything that he contributed to the subject-matter of natural science or even of his own profession; his name is absolutely unknown in the history of medicine, and his services to botany were such as, in the nature of things, would be soon forgotten. But his purchase of the manor of Chelsea has perpetuated his memory in the name of a "place," a street, and a square. His great stroke as a collector was to acquire (by bequest, conditional on paying off certain debts) in 1701 the cabinet of William Courten, who had made collecting the business of his life. When Sloane retired from active work in 1741 his library and cabinet of curiosities, which he took with him from Bloomsbury to his house in Chelsea, had grown to be very extensive and of unique value. On his death on 11th January 1753 he bequeathed his books, manuscripts, prints, drawings, pictures, medals, coins, seals, cameos, and other curiosities to the nation, on condition that parliament should pay to his executors £20,000, which was a good deal less than the value of the collection. The bequest was accepted on those terms by an Act passed the same year, and the collection, together with George II.'s royal library, &c., was opened to the public at Bloomsbury as the British Museum in 1759. Among his other acts of benevolence or munificence may be mentioned his gift to the Apothecaries' Company of the freehold of the botanical or physic garden, which they had rented from the Chelsea estate since 1673, also his help in starting the founding hospital. Sloane is described as having been a man of considerable presence and of courtly address.

See Weld, *History of the Royal Society*, i. 450 (London, 1848); and Munk, *Roll of the College of Physicians*, 2d ed., i. 466 (London, 1878).

SLODTZ, RENÉ MICHEL or MICHEL ANGE (1715-1764), French sculptor, was born at Paris on 29th September

1715. He passed seventeen years of his life at Rome, where he was chosen to execute a statue of St Bruno, one of the best modern works of the class in St Peter's. He was also the sculptor of the tomb of Marquis Capponi in St John of the Florentines. Other works of his are to be seen at the church of St Louis of France and at Santa Maria della Scala. After his return to France, Slodtz, in conjunction with his brothers Sebastian and Paul, produced many decorative works in the churches of Paris, and, though much has been destroyed, his most considerable achievement—the tomb of Languet de Gergy in St Sulpice—exists at the present day. He died at Paris on 26th October 1764.

Slodtz had been, like his brothers, a member of the Academy of Painting and Sculpture, and many particulars of his life are preserved in a memoir written by Cochin, and also in a letter from the same to the *Gazette Littéraire*, which was reproduced by Castilhon in the *Nécrologe* of 1766. Slodtz's father (1655-1726) was also a sculptor, born at Antwerp; he became a pupil of Girardon and worked mostly under him at Versailles and the Tuileries.

See C. N. Cochin, *Mém. inéd.*, Paris, 1881; Barbot de Jouy, *Sculpture moderne du Louvre*, Paris, 1856; Dussieux, *Artistes Français à l'Étranger*, Paris, 1852.

SLONIM, a district town of Russia, in the government of Grodno, 105 miles south-east of Grodno and 20 from the railway from Moscow to Warsaw, on the high craggy banks of the Schara. It derives its importance from this river, which is navigable and enters the system of the Oginski Canal connecting the Niemen with the Dnieper. Corn, tar, and especially timber are exported annually to a large amount, which in 1882 reached the value of £20,700. The population was 21,110 in 1883.

Slonim is a very old town, being mentioned in 1040, when Yaroslaff defeated the Lithuanians in its neighbourhood and compelled them to acknowledge his rule. In 1241 the Mongols, under Batyi, pillaged it and burned its wooden fort. Owing to its position between Galician Russia and Lithuania, it often changed hands until it was conquered by the Lithuanians in the 14th century. From 1631 to 1685 it was the seat of the Lithuanian *sejm* and became a flourishing city. In the 18th century, under the hetman Oginski, a canal was dug to connect the Schara with the Dnieper. Oginski embellished the city and founded there a printing-office. Russia annexed the town in 1795.

SLOTH. The general characters by which the family *Bradypodidae* are distinguished from the rest of the order *Edentata* have been given in the article MAMMALIA (vol. xv. p. 384). The sloths, as the animals of this family are called on account of the habitual sluggishness of their



Two-toed sloth (*Choloepus hoffmanni*).

movements, are the most strictly arboreal of all mammals, living entirely among the branches of trees, usually hanging under them, with their backs downwards, and clinging

to them with the simple hook-like organs to which the terminations of all their limbs are reduced. When they are obliged from any cause to descend to the ground, which they rarely, if ever, do voluntarily, their limbs, owing to their unequal length and the peculiar conformation of the feet—which allows the animals to rest only on the outer edge—are most inefficient for terrestrial progression, and the sloths crawl along a level surface with considerable difficulty. Though generally slow and inactive, even when in their natural haunts, they can on occasions travel with considerable rapidity along the branches, and, as they do not leap, like most other arboreal creatures, they avail themselves of the swaying of the boughs by the wind to pass from tree to tree. They feed entirely on leaves and young shoots and fruits, which they gather in their mouth, the fore-limbs aiding in dragging boughs within reach, but not being used as hands, as they are by monkeys, squirrels, &c. When sleeping they roll themselves up in a ball, and, owing to the dry shaggy character of their hair, are very inconspicuous among the mosses and lichens with which the trees of their native forests abound; and the concealment thus afforded is heightened in some species by the peculiar greenish tint of the outer covering,—very uncommon in mammals. This is not due to the colour of the hair itself, but to the presence upon its surface of an alga, the lodgement of which is facilitated by the fluted or rough surface of the exterior of the hair, and the growth of which is promoted by the dampness of the atmosphere in the gloomy tropical forests, as it soon disappears from the hair of animals kept in captivity in England. Sloths are nocturnal, silent, inoffensive, and solitary animals, and produce usually but one young at birth. They appear to show an almost reptilian tenacity of life, surviving the most severe injuries and large doses of poisons, and exhibiting longer persistence of irritability of muscular tissue after death than other mammals.

The sloths were all included in the Linnean genus *Bradypus*, but Illiger very properly separated the species with but two claws on the fore-feet, under the name of *Choloepus*, leaving *Bradypus* for those with three.

Genus *Bradypus*.—Three-toed sloths. Teeth usually $\frac{3}{3}$ on each side; no tooth projecting greatly beyond the others; the first in the upper jaw much smaller than any of the others; the first in the lower jaw broad and compressed; the grinding surfaces of all much cupped. Vertebrae: C 9, D and L 20 (of which 15 to 17 bear ribs), S 6, C 11. All the known species present the remarkable peculiarity of possessing nine cervical vertebrae, *i.e.*, nine vertebrae in front of the one which bears the first thoracic rib (or first rib connected with the sternum, and corresponding in its general relations with the first rib of other mammals); but the ninth, and sometimes the eighth, bears a pair of short movable ribs. The arms or fore-limbs are considerably longer than the hind legs. The bones of the fore-arm are complete, free, and capable of pronation and supination. The hand is long, very narrow, habitually curved, and terminates in three pointed curved claws, in close apposition with each other; they are, in fact, incapable of being divaricated, so that the hand is reduced to the condition of a triple hook, fit only for the function of suspension from the boughs of trees. The foot closely resembles the hand in its general structure and mode of use. The sole is habitually turned inwards and cannot be applied to the ground in walking. The tongue is short and soft, and the stomach large and complex, bearing some resemblance to that of the ruminating animals. The windpipe or trachea has the remarkable peculiarity among mammals—not infrequent among birds and reptiles—of being folded on itself before it reaches the lungs. The mammae are two and pectoral in position.

"Ai" is the common name given in books to the three-toed sloths. They were all comprised by Linnaeus under the species *Bradypus tridactylus*. More recently Dr Gray has described as many as eleven, ranged in two genera, *Bradypus* and *Arctopithecus*; but the distinctions which he assigns both to species and to genera do not bear close examination. Some are covered uniformly with a grey or greyish brown coat; others have a dark collar of elongated hairs around the shoulders (*B. torquatus*); some have the hair of the face very much shorter than that of the rest of the head and neck; and others have a remarkable-looking patch of soft short hair on the back between the shoulders, consisting when best marked of a median stripe of glossy black, bordered on each side by bright

orange, yellow, or white. There are also structural differences in the skulls, as in the amount of inflation of the pterygoid bones, which indicate real differences of species; but the materials in our museums are not yet sufficient to correlate these with external characters and geographical distribution. The habits of all are apparently alike. They are natives of Guiana, Brazil, and Peru, and one if not two species (*B. infuscatus* and *B. castaneiceps*) extend north of the Isthmus of Panama as far as Nicaragua. Of the former of these Dr Seeman says that, though generally silent, a specimen in captivity uttered a shrill sound like a monkey when forcibly pulled away from the tree to which it was holding.¹

Genus *Cholepus*.—Teeth $\frac{1}{2}$; the most anterior in both jaws separated by an interval from the others, very large, caniniform, wearing to a sharp, bevelled edge against the opposing tooth, the upper shutting in front of the lower when the mouth is closed, unlike the true canines of heterodont mammals. Vertebrae: C 6 or 7, D 23-24, L 3, S 7-8, C 4-6. One species (*C. didactylus*) has the ordinary number of vertebrae in the neck; but an otherwise closely allied form (*C. hoffmanni*) has but six. The tail is very rudimentary. The hand generally resembles that of *Bradypus*; but there are only two functional digits, with claws,—those answering to the second and third of the typical pentadactyle manus. The structure of the hind limb generally resembles that of *Bradypus*, the appellation "two-toed" referring only to the anterior limb, for in the foot the three middle toes are functionally developed and of nearly equal size. *C. didactylus*, which has been longest known, is commonly called by the native name of *Unau*. It inhabits the forests of Brazil. *C. hoffmanni* has a more northern geographical range, extending from Ecuador through Panama to Costa Rica. Its voice, which is seldom heard, is like the bleat of a sheep, and if the animal is seized it snorts violently. Both species are very variable in external coloration. (W. H. F.)

SLOUGH, an urban sanitary district of Buckinghamshire, England, is situated on the Great Western Railway, 18½ miles west of London and 2 north of Windsor. Within recent years it has largely increased, and it contains a number of good shops and villas. It is supplied with water from artesian wells. The parish church of St Mary, erected 1837, has been recently enlarged. Among other public buildings are the British orphan asylum, the Eton union workhouse, and the reading-room and literary institute. Sir William Herschel, the astronomer, resided at Slough, and there constructed his telescope. The population of the urban sanitary district, which embraces parts of the parishes of Stoke Poges and Upton-cum-Chalvey, in 1871 was 4509 and in 1881 (area, 401 acres) it was 5095.

SLOVAKS. See SLAVS.

SLOVENES. See SLAVS.

SLUG. See SNAIL.

SLUTSK, a district town of Russia, in the government of Minsk, situated on the Stutcha river (tributary of the Pripet), 123 miles south of Minsk. This old town is mentioned in the 12th century as a dependency of Kieff, and, like other towns of the region, was devastated by the Tatars, and later suffered in the wars between Russia and Poland. It is now merely a large village, whose inhabitants are chiefly engaged in agriculture, with a little trade in corn, timber, and wooden wares. The immense marshy and woody tracts of the Polesie (see MENSCK) surround it on all sides, the Stutcha being its chief means of communication. Its population remains almost stationary and was 19,000 in 1883.

SMALLPOX, or VARIOLA (*varus*, "a pimple"), an acute infectious disease characterized by fever and by the appearance on the surface of the body of an eruption, which, after passing through various stages, dries up, leaving more or less distinct cicatrices. Few diseases have been so destructive to human life as smallpox, and it has ever been regarded with horror alike from its fatality, its loathsome accompaniments and disfiguring effects, and from the fact that no age and condition of life are exempt from liability to its occurrence. Although in most civilized countries its ravages have been greatly limited by the protection afforded by vaccination, yet epidemic outbreaks are far

¹ Godman and Salvin's *Biologia Centrali-Americana*, p. 184.

from uncommon, affecting especially those who are unprotected, or whose protection has become weakened by lapse of time.

Much obscurity surrounds the early history of smallpox. It appears to have been imported into Europe from Asia, where it had been known and recognized from remote antiquity. The earliest accounts of its existence reach back to the middle and end of the 6th century, when it was described by Procopius and Gregory of Tours as occurring in epidemic form in Arabia, Egypt, and the south of Europe. In one of the narratives of the expedition of the Abyssinians against Mecca (c. 550) the usual miraculous details are combined with a notice of smallpox breaking out among the invaders.² Not a few authorities, however, regard these accounts as referring not to smallpox but to plague. The most reliable statements as to the early existence of the disease are found in Rhazes (see vol. xv. p. 805), by whom its symptoms were clearly described, its pathology explained by a humoral or fermentation theory, and directions given for its treatment. During the period of the crusades smallpox appears to have spread extensively through Europe, and hospitals for its treatment were erected in many countries. But at this period and for centuries afterwards the references to the subject include in all likelihood other diseases, since no precise distinction appears to have been made between the different forms of eruptive fever until a comparatively recent date. Smallpox was known in England as early as the 13th century, and had probably existed there before. It appears to have been introduced into America shortly after the discovery of that continent, and there, as in Europe and throughout the known world, destructive epidemics were of frequent occurrence during succeeding centuries.

The only known factor in the origin of smallpox is contagion,—this malady being probably the most contagious of all diseases. Its outbreak in epidemic form in a locality may frequently be traced to the introduction of a single case from a distance. The most direct means of communicating smallpox is inoculation (see below). By far the most common cause of conveyance of the disease, however, is contact with the persons or the immediate surroundings of those already affected. The atmosphere around a smallpox patient is charged with the products of the disease, which likewise cling tenaciously to clothing, furniture, &c. The disease is probably communicable from its earliest manifestations onwards to its close, but it is generally held that the most infectious period extends from the appearance of the eruption till the drying up of the pustules. Smallpox may also readily be communicated by the bodies of those who have died from its effects. No age is exempt from susceptibility to smallpox. Infants are occasionally born with the eruption or its marks upon their bodies, proving that they had undergone the disease *in utero*. Dark-skinned races are said to suffer more readily and severely than whites. One attack of smallpox as a rule confers immunity from any recurrence, but there are numerous exceptions to this rule. Overcrowding and all insanitary surroundings favour the spread of smallpox where it has broken out; but the most influential condition of all is the amount of protection afforded to a community by previous attacks and, especially in the present day, by vaccination. Such protection, although for a time most effectual, tends to become exhausted, unless renewed. Hence in a large population there is always likely to be an increasing number of individuals who have become susceptible to smallpox. This probably explains its occasional and even apparently

² See Nöldeke, *Geschichte der Perser*. . . aus Tabari (Leyden, 1879), p. 218. Nöldeke thinks that this notice may be taken from genuine historical tradition, and seems to find an allusion to it in an old poem.

periodic epidemic outbreaks in large centres, and the well-known fact that the most severe cases occur at the commencement,—those least protected being necessarily more liable to be first and most seriously attacked.

While the symptoms of smallpox are essentially the same in character in all cases, they are variously modified according to the form which the disease may assume, there being certain well-marked varieties of this as of most other infectious maladies. The following description applies to an average case. After the reception into the system of the smallpox contagion the onset of the symptoms is preceded by a period of incubation, during which the patient may or may not complain. This period is believed to be from about ten to fourteen days. In cases of direct inoculation of the virus it is considerably shorter. The invasion of the symptoms is sudden and severe, in the form of a rigor followed by fever (the *primary fever*), in which the temperature rises to 103° or 104° Fahr. or higher, notwithstanding that perspiration may be going on. A quick pulse is present, together with thirst and constipation, while intense headache accompanied with vomiting and pain in the back is among the most characteristic of the initial symptoms. Occasionally the disease is ushered in by convulsions. Some authorities hold that the more violent the invasion the more severe the attack is likely to prove. These symptoms continue with greater or less intensity throughout two entire days, and during their course there may occasionally be noticed on various parts of the body, especially on the lower part of the abdomen and inner sides of the thighs, a diffuse redness accompanied by slight spots of extravasation (*petechiæ*), the appearance somewhat resembling that of scarlet fever. These "prodromal rashes," as they are termed, appear to be more frequent in some epidemics than in others, and they do not seem to have any special significance. They are probably more frequently seen in cases of the mildest form of smallpox (varioid), referred to below. On the third day the characteristic eruption begins to make its appearance. It is almost always first seen on the face, particularly about the forehead and roots of the hair, in the form of a general redness; but upon this surface there may be felt by the finger numerous elevated points more or less thickly set together. The eruption, which is accompanied by heat and itching, spreads over the face, trunk, and extremities in the course of a few hours,—continuing, however, to come out more abundantly for one or two days. It is always most marked on the exposed parts; but in such a case as that now described the individual "pocks" are separated from each other (discrete). On the second or third day after its appearance the eruption undergoes a change,—the pocks becoming vesicles filled with a clear fluid. These vesicles attain to about the size of a pea, and in their centre there is a slight depression, giving the characteristic umbilicated appearance to the pock. The clear contents of these vesicles gradually become turbid, and by the eighth or ninth day they are changed into pustules containing yellow matter, while at the same time they increase still further in size and lose the central depression. Accompanying this change there are great surrounding inflammation and swelling of the skin, which, where the eruption is thickly set, produce much disfigurement and render the features unrecognizable, while the affected parts emit an offensive odour, particularly if, as often happens, the pustules break. The eruption is present not only on the skin but on mucous membranes, that of the mouth and throat being affected at an early period; and the swelling produced here is not only a source of great discomfort but even of danger from the obstruction thus occasioned in the upper portion of the air-passages. The voice is hoarse and a copious flow of saliva comes from

the mouth. The mucous membrane of the nostrils is similarly affected, while that of the eyes may also be involved, to the danger of permanent impairment of sight. The febrile symptoms which ushered in the disease undergo marked abatement on the appearance of the eruption on the third day, but on the eighth or ninth, when the vesicles become converted into pustules, there is a return of the fever (*secondary or suppurative fever*), often to a severe extent, and not unfrequently accompanied by prominent nervous phenomena, such as great restlessness, delirium, or coma. On the eleventh or twelfth day the pustules show signs of drying up (desiccation), and along with this the febrile symptoms decline. Great itching of the skin attends this stage. The scabs produced by the dried pustules gradually fall off and a reddish brown spot remains, which, according to the depth of skin involved in the disease, leaves a permanent white depressed scar,—this "pitting" so characteristic of smallpox being specially marked on the face. Convalescence in this form of the disease is as a rule uninterrupted.

There are certain varieties of smallpox depending upon the form it assumes or the intensity of the symptoms. *Confluent smallpox* (*variola confluens*), while essentially the same in its general characters as the form already described, differs from it in the much greater severity of all the symptoms—even from the onset, and particularly in regard to the eruption, which, instead of showing itself in isolated pocks, appears in large patches run together, giving a blistered aspect to the affected skin. This confluent condition is almost entirely confined to the face, and produces shocking disfigurement, while subsequently deep scars remain and the hair may be lost. The mucous membranes suffer in a similar degree of severity, and dangerous complications may arise from the presence of the disease in the mouth, throat, and eyes. Both the primary and secondary fevers are extremely severe. The mortality is very high, and it is generally estimated that at least 50 per cent. of such cases prove fatal, either from the violence of the disease or from one or other of the numerous complications which are specially apt to attend upon it. Convalescence is apt to be slow and interrupted. Another variety is that in which the eruption assumes the *hæmorrhagic* form owing to bleeding taking place into the pocks after their formation. This is apt to be accompanied with hæmorrhages from various mucous surfaces (particularly in the case of females), occasionally to a dangerous degree and with symptoms of great prostration. Many of such cases prove fatal. A still more serious form is that termed *malignant smallpox*, in which, as in the malignant forms of other infectious diseases (see MEASLES and SCARLET FEVER), the patient is from the onset overwhelmed with the poison and quickly succumbs,—the rash scarcely, if at all, appearing or showing the hæmorrhagic or purpuric character. Such cases are, however, comparatively rare. The term *varioid* or *modified smallpox* is applied to cases occurring in persons constitutionally but little susceptible to the disease, or in whom the protective influence of vaccination or a previous attack of smallpox still to some extent exists. Cases of this mild kind are of very common occurrence where vaccination has been systematically carried out. As compared with an average case of the unmodified disease as above described, this form is very marked, the differences extending to all the phenomena of the disease. (1) As regards its onset, the initial fever is much milder and the premonitory symptoms altogether less in severity. (2) As regards the eruption, the number of pocks is smaller, often only a few and mostly upon the body. They not unfrequently abort before reaching the stage of suppuration; but should they proceed to this stage the secondary fever is extremely slight or even