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# AMERICAN CYCLOPÆDIA:

A

Popular Dictionary

OF

## GENERAL KNOWLEDGE.

EDITED BY

GEORGE RIPLEY AND CHARLES A. DANA.

*SECOND EDITION, REVISED.*

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THE

AMERICAN CYCLOPÆDIA.

KINGLET

**KINGLET** (*regulus cristatus*, Ray), a well known European bird, often called golden-crowned warbler and wren. It is  $3\frac{1}{2}$  in. long, yellowish olive-green above and yellowish gray below, with an orange-yellow crest bordered on each side with black. Though a permanent resident in Great Britain, considerable numbers come from the north in winter; they are fond of fir woods, very sociable with the titmice and creepers, hopping actively from

KING'S

the ruby-crowned and golden-crested kinglet or wren, the *R. calendula* and *satrapa* of Lichtenstein, the former with a concealed crimson and the latter with an orange-red crown.

**KINGMAN**, a S. county of Kansas, recently formed, and not included in the census of 1870; area, 540 sq. m. It is intersected by the Ne-ne Squaw river.

**KINGS**, a S. E. county of New York, forming the W. extremity of Long Island; area, 72 sq. m.; pop. in 1870, 419,921. It lies between the East river and New York harbor and the Atlantic ocean, embracing several small islands adjacent to the coast. A range of drift hills, from 50 to 300 ft. above tide water, crosses it from S. W. to N. E. The soil is a light sandy loam, capable of varied cultivation. The South Side railroad of Long Island, the Brooklyn, Bath, and Coney Island railroad, and the Brooklyn Central branch of the Long Island railroad pass through it. The chief productions in 1870 were 44,600 bushels of Indian corn, 547,375 of potatoes, and 2,057 tons of hay. There were on farms 1,241 horses, 16 mules and asses, 1,148 milch cows, 67 other cattle, and 750 swine. There are numerous manufacturing establishments, chiefly in Brooklyn, the county seat. In 1873 a proposition for the incorporation of the county towns with the city of Brooklyn was submitted to a popular vote, which resulted adversely.

**KING'S**. I. A S. central county of New Brunswick, Canada, drained by the St. John river; area, 1,408 sq. m.; pop. in 1871, 24,593, of whom 10,841 were of Irish, 8,279 of English, 2,705 of Scotch, and 1,136 of German descent. It is traversed by the European and North American and the Intercolonial railways. The surface is diversified by a succession of hills, some of which, as the Pisgah, Piccadilla, and Moose hills, rise to a considerable height. The whole county, with its large tracts of intervals and meadow, bays, and rivers, presents a varied



1. Golden-crowned Kinglet (*Regulus cristatus*). 2. Ruby-crowned Kinglet (*Regulus calendula*).

branch to branch and clinging in various positions to the twigs in search of small insects. The nest is neat and cup-shaped, made of moss and lined with feathers, so suspended from three or four twigs that the branch shelters the opening; the eggs are six to ten; the female is very bold when hatching, and both sexes are very attentive to the young; the song is soft and pleasing. There are two nearly allied species of this genus in North America:

and somewhat romantic landscape, and it is one of the best agricultural counties of the province. Iron ore of fine quality is abundant. Coal exists, but has not yet been mined. Limestone and gypsum are plentiful, and there are many mineral springs. Capital, Hampton.

**II.** A S. W. county of Nova Scotia, Canada, situated on the bay of Fundy and Minas basin; area, 812 sq. m.; pop. in 1871, 21,510, of whom 14,392 were of English, 3,755 of Irish, and 1,841 of Scotch descent. It is traversed by the Windsor and Annapolis railway. The coast line is broken and picturesque, but the borders of the rivers Annapolis, Gaspereaux, Cornwallis, Cunard, Habitant, and Pereau are flat, with large tracts of the richest alluvial deposits. The principal settlements are on those streams and on the route from Halifax to Annapolis. The Cornwallis river will admit steamers of light draft for upward of 20 miles. The soil is fertile, and the county contains iron ore, copper, silver, and slate. Capital, Kentville. **III.** The E. county of Prince Edward Island, Canada; area, 644 sq. m.; pop. in 1871, 23,068. It is traversed by the Prince Edward Island railway. Its coasts are deeply indented by bays and inlets, and lined with settlements. There are also many villages in the interior. Capital, Georgetown.

**KING'S**, an inland county of Ireland, in the province of Leinster, bordering on Westmeath, Meath, Kildare, Queen's, Tipperary, Galway, and Roscommon counties; area, 770 sq. m.; pop. in 1871, 75,781. On the south it is somewhat broken by ramifications of the Slievebloom mountains, among the principal summits of which are Arderin, 1,733 ft. high, and Carrol hill, 1,584 ft. The principal lakes are Loughs Fin, Boara, Annaghmore, and Pallas. The Shannon, Boyne, Barrow, and Brosna are the largest rivers. The soil is of average fertility, and agriculture is devoted to the usual corn crops. There are few minerals and no important manufactures. The chief towns are Parsonstown and Tullamore.

**KINGS, Books of**, one of the chief divisions of the historical series of the canonical Scriptures. In their contents, if not entirely in style and arrangement, they are a continuation of the books of Samuel, as the latter are of that of Judges. The Hebrew Bible originally had only one book of Kings, which in the Septuagint, the Vulgate, and modern Hebrew editions is divided into two. Both versions give the title books of Kings also to the books of Samuel, and thus have four books of Kings. Commencing with the conclusion of the history of David, to which the second book of Samuel and much of the first are devoted, the books of Kings proper relate the history of the Hebrew state under Solomon and Rehoboam, of the divided state under the rival dynasties of Israel and Judah, and of the latter alone, after the captivity of the ten tribes, down to the destruction of Jerusalem by the Babylonians. They thus cover altogether a period of about 430

years, beginning with about 1015 B. C. Some chapters dwell with special interest on the acts of the prophets Elijah and Elisha. Excepting these, the work seems to be an extract from annals of the Hebrew kings, to which reference is frequently made. The name of the author is unknown. Some suppose him to be identical with the author of Samuel, which others regard as improbable on critical grounds. He was probably a contemporary of Jeremiah, if not that prophet himself. The division of the work into two books is not founded on any intrinsic reasons. Among the best commentaries upon the book are those by Keil (1848; revised ed., 1865), Thenius (1849), and George Rawlinson (in the collection known as the "Speaker's Commentary," 1873).

**KINGSBOROUGH, Edward King**, viscount, an English archæologist, born Nov. 16, 1795, died in Dublin, Feb. 27, 1837. He is distinguished for his great work entitled "Antiquities of Mexico, comprising Facsimiles of Ancient Mexican Paintings and Hieroglyphics, together with the Monuments of New Spain by M. Dupax, with their respective Scales of Measurement, and accompanying Descriptions; the whole illustrated by many valuable inedited MSS." (9 vols. fol., London, 1831-'48). The eighth and ninth volumes were published after his death, which took place from a fever caught in a debtor's prison, where he had been temporarily confined for a resistance to an attempted imposition. The first seven volumes are estimated to have cost upward of \$300,000. The work is chiefly valuable for its generally faithful reproduction, in facsimile, of such Mexican hieroglyphical or painted records and rituals as were known to exist in the libraries and private collections of Europe. These, however, are often carelessly arranged, and the pages so confused as to be utterly unintelligible except to advanced students in American archæology. Most of the original speculations of Lord Kingsborough are exceedingly loose and crude, and mainly directed to the establishment of the hypothesis of the Jewish origin of the American Indians, or at least of the semi-civilized nations of Mexico and Central America. The ninth volume, containing the relation of Don Alva Ixtlilxochitl, is imperfect, closing abruptly without finishing the relation. Since the publication of the work of Lord Kingsborough a large number of additional Mexican MSS. or paintings have come to light, including a considerable part of those collected by Boturini, and supposed to have been lost. It has also been found, by careful collation, that the facsimiles of the work are not always critically correct.

**KINGSBURY**, a S. E. county of Dakota, recently formed and not included in the census of 1870; area, about 750 sq. m. It is intersected in the W. part by the Dakota or James river.

**KINGSLEY, Calvin**, an American clergyman, born at Annsville, N. Y., Sept. 8, 1812, died in Beyrout, Syria, April 6, 1870. He was licensed

to preach in 1837. In 1841 he graduated at Alleghany college, Meadville, Pa., united with the Erie conference of the Methodist Episcopal church, and was elected professor of mathematics in his college. The withdrawal of public funds from colleges by Pennsylvania in 1843 induced the trustees of the college to employ him to secure its endowment. After a year spent in this labor, and two years in the pastorate at Erie, Pa., he was in 1846 recalled to the college, where he remained until his election as editor of the "Western Christian Advocate" in 1856. He continued in this office till 1864, when he was elected bishop. In 1867 he visited the mission conferences of Germany and Scandinavia, which had been placed under his superintendence. In May, 1869, he started on an episcopal tour around the world. He visited the conferences on the Pacific slope, the China conference at Foochow, and the India conference at Bareilly, and had passed by way of Egypt through Palestine into Syria, when he died. Besides numerous controversial treatises on slavery and other topics, he published "Resurrection of the Human Body," "The Hermits" (12mo, Philadelphia, 1868), "Round the World, a Series of Letters" (2 vols. 16mo, Cincinnati, 1870), and two volumes of sermons.

**KINGSLEY. I. Charles**, an English clergyman, born at Holne, Devonshire, June 12, 1819. He is the son of the Rev. Dr. Kingsley, rector of St. Luke's, Chelsea, and formerly vicar of Holne. In his 14th year he was placed under the care of the Rev. Derwent Coleridge, at Ottery St. John, and at the age of 20 was sent to King's college, London, whence in 1840 he removed to Magdalen college, Cambridge. He took his bachelor's degree in 1842. After a few months' study of the law he entered the church, and in 1844 was presented to the living of Eversley in Hampshire, of which parish he had previously been curate. From the commencement of his labors in the ministry he has taken part in various efforts to ameliorate the condition of the working classes, and his "Twenty-five Village Sermons" (1844), addressed to the rustic people who formed the bulk of his parishioners, won the sympathies of those for whose benefit they were intended. His "Saint's Tragedy" (1848), a dramatic poem founded on the history of Elizabeth of Hungary, attracted attention not less from its literary merits than from its supposed enunciation of the doctrines of what was known as "Christian socialism." The revelations subsequently made by Mr. Henry Mayhew in his series of papers on "London Labor and the London Poor" caused him to join the Rev. Mr. Maurice and others in a series of interviews with artisans and laborers, the result of which was the establishment among them of coöperative associations, for the purpose of undertaking work in common and sharing the proceeds. Under the influence of these investigations he published in 1850 "Alton Locke, Tai-

lor and Poet," a novel dealing with the social and political abuses of the day with a vigor and earnestness which gained for the author the title of the "chartist parson," and fully identified him with the theories of the "Christian socialists." In a pamphlet entitled "Cheap Clothes and Nasty," published just before "Alton Locke" appeared, he had urged that public hygiene and political economy demanded that no individual man should be condemned from his birth to physical disease and moral despair. The story of "Alton Locke" was an elaboration of this plea. In like manner his romance, "Westward Ho! or the Voyages and Adventures of Sir A. Leigh, Knt." (3 vols. 8vo, 1855), is an expression of his belief that a religious soul can be truly developed only in a healthy body. His prose publications, in addition to those mentioned, include "Yeast, a Problem" (1851); "Hypatia, or New Foes with an Old Face" (2 vols., 1853); "Sermons on National Subjects preached in a Village Church" (2 vols., 1852); "Phaëthon, or Loose Thoughts for Loose Thinkers" (1852); "Alexandria and her Schools" (1854); "Sermons for the Times" (1855); "Glaucus, or the Wonders of the Shore," a little treatise on marine zoölogy and botany; "The Heroes, or Greek Fairy Tales" (1856); "Two Years Ago" (1856); "Sir Walter Raleigh and his Times;" "Good News of God" (1859); "The Water Babies," a fairy story (1863); "The Roman and the Teuton," lectures delivered at Cambridge (1864); "Hereward, the Last of the English" (1866); "The Hermits" (1867); "How and Why?" (1869); "At Last: a Christmas in the West Indies" (1871); "Plays and Puritans," and "Prose Idyls" (1873); "Westminster Sermons," and "Health and Education" (1874); and a variety of miscellaneous sermons and magazine articles. As a lyric poet he has attained a high rank by a number of pieces scattered through his prose writings and contributed to various periodicals. A collection of them, including "The Saint's Tragedy," was published in Boston in 1856, and republished in London in 1857, followed in 1858 by a volume containing "Andromeda," a hexameter poem, and other pieces. He was appointed professor of modern history at Cambridge in 1859, and after resigning his chair was made canon of Chester in 1869, and subsequently of Westminster, and chaplain to the queen. In 1872 he became editor of "Good Words." In 1873-'4 he visited and lectured in the United States. **II. Henry**, an English author, brother of the preceding, born at Holne in 1824. He studied at Oriel college, Oxford, and passed many years in Australia. Returning to England in 1858, he published a novel of Australian life entitled "The Recollections of Geoffrey Hamlyn." Since then he has written "Ravenshoe" (1861); "Austin Elliot" (1863); "The Hillyars and the Burtons" (1865); "Leighton Court" (1866); "Mademoiselle Mathilde;" "Stretton, Hetty, and

other Stories;" "Old Margaret" (1871); and "Reginald Hetheridge" (1874). He was for a time editor of the "Daily Review," and its correspondent in the Franco-German war.

**KINGSLEY, James Luce**, an American scholar, born in Windham, Conn., Aug. 28, 1778, died in New Haven, Aug. 31, 1852. He graduated at Yale college in 1799, and engaged in teaching, first in Wethersfield, and afterward in his native town. In 1801 he was appointed a tutor in Yale college, and in 1805 received the newly established professorship of the Hebrew, Greek, and Latin languages in the same institution. He was relieved of a portion of his duties in 1831, when a separate professorship of Greek was instituted, and of another portion in 1835, when a professorship of sacred literature was founded. In Latin he continued to instruct until his resignation in 1851. He published a few Latin text books, a discourse on the 200th anniversary of the founding of New Haven, a history of Yale college in the "American Quarterly Register," and a life of Ezra Stiles in Sparks's "American Biography."

**KING'S MOUNTAIN**, a post village in Gaston co., N. C., in the vicinity of which is an eminence of the same name, situated in York co., S. C., about 80 m. N. by W. of Columbia, which was the scene of a memorable conflict in the revolutionary war, Oct. 7, 1780. Immediately after the battle of Camden (August, 1780), Lord Cornwallis despatched Major Patrick Ferguson to scour the western part of South Carolina, and rejoin him at Charlotte, in Mecklenburg co., N. C. Ferguson's force was gradually increased by enlistments to 1,200 men, and the new recruits, mostly tory desperadoes of the worst stamp, committed frightful excesses upon the inhabitants of the country. In the latter part of September, when within a few days' march of Charlotte, he turned aside toward the mountains to disperse a small American force under Col. Clarke; but upon arriving at Gilbert Town, in what is now Rutherford co., N. C., he learned that a large body of "mountain men," as the frontiersmen of Georgia and the Carolinas were called, had assembled to oppose his progress. Breaking up his quarters, he pushed forward to join Cornwallis, sending expresses to inform the latter of his danger, all of whom, however, were intercepted. The patriot forces started immediately in pursuit. The main body, about 900 mounted men, marching all night, came up with Ferguson at 3 P. M. on the 7th, posted on King's mountain, a narrow stony ridge elevated about 100 ft. from the neighboring ravines, and upward of a mile in length. The Americans were formed into three bodies, the centre commanded by Cols. Campbell and Shelby, the right by Cols. Sevier and McDowell, and the left by Cols. Cleveland and Williams, which moved simultaneously from different points upon the enemy. Ferguson immediately charged Sevier and McDowell, and pushed them down the hill with the bayonet, the tories using rifles

and fowling pieces armed at the end with large knives. A flank fire from Cleveland and Williams caused him to turn against his new assailants; but the latter had scarcely been repulsed when he was confronted by the centre under Campbell and Shelby and the rallied troops of Sevier. In this manner the fight continued for upward of an hour, until the enemy, harassed on all sides by the fire of the riflemen, which was rapidly thinning their ranks, were thrown into confusion, and began to retreat along the ridge. Ferguson prepared for one final charge, and fell at the head of his regulars pierced by seven bullets, dying, according to tradition, by the hand of Col. Williams, who was also slain. His men, disheartened by his fall, surrendered to the number of nearly 800, 240 having fallen. Only 200 escaped. The Americans lost only 20 men killed, although a large number were wounded. This action did much to precipitate the downfall of British power in the south.

**KINGSTON**, a city and the county seat of Ulster co., New York, on the W. bank of the Hudson river, about 90 m. N. of New York and 55 m. S. of Albany, and on the N. bank of Rondout creek, which is navigable for 3 m. and is its harbor; pop. in 1874, about 22,000. It is the terminus of the Delaware and Hudson canal, and of the New York, Kingston, and Syracuse, and the Walkkill Valley railroads, which communicate by ferry with Rhinebeck, a station on the Hudson River railroad on the opposite bank of the river. Steamboats connect it with New York, Albany, and intermediate places. It has a wharfrage front of 4 m. Forty-three steamboats owned in the city are employed in transporting freight and passengers, and in towing. The shipment of coal, blue stone, brick, ice, cement, lime, lumber, &c., exceed 2,500,000 tons per annum. Kingston is the centre of the blue-stone or flagging trade. The quarries are scattered through a region nearly 100 m. in length, reaching from the Delaware river to the Hudson, and the stone is brought to the city by wagon, rail, and canal. Hydraulic cement, for which Ulster co. is celebrated, is mainly shipped from Kingston, amounting to a yearly aggregate of 1,500,000 barrels. The largest cement manufactory in the country, that of the Newark lime and cement manufacturing company, situated in the city, turns out 225,000 barrels yearly. The stone is obtained by tunnelling the hills which face the creek and river, and by running galleries in the layers of rock. These galleries are nearly two miles in length, and are often sunk to a depth of 200 ft. The average thickness of the layers is 30 ft., and they incline at all angles from vertical to horizontal. The city also contains four founderies and machine shops, a planing mill, a manufactory of malt, four of cigars, one of glue, a tanning and currying establishment, nine breweries, 13 carriage factories, several boat and ship-building establishments, five brick yards, five national

banks with an aggregate capital of \$1,125,000, and three savings banks. It is divided into nine wards, and is governed by a mayor and 18 aldermen. The recorder holds a police court, and there is a volunteer fire department. The streets are lighted partly with gas and partly with kerosene. The disbursements for the year ending March 9, 1874, were \$90,518 29. The bonded debt at that date amounted to \$650,660, of which \$600,660 was contracted to pay for stock in railroads. Besides the county buildings, there are the music hall, the almshouse, the city hall (in progress), and several hotels. The educational institutions, besides several large private schools, embrace a number of graded and ungraded public schools, having in 1873 46 teachers; pupils enrolled, 3,291; average attendance, 1,951. The number of children of school age (5 to 21) was 7,235; expenditures for school purposes, \$55,380, of which \$32,248 were for teachers' wages. There are one daily and five weekly newspapers, and 21 churches, viz.: Baptist, 2; Episcopal, 2; German Evangelical Lutheran, 2; Jewish, 2; Methodist, 4; Presbyterian, 2; Reformed, 3; Roman Catholic, 3; children's church, 1.—Kingston was incorporated as a city by act of March 29, 1872. It was formed from a portion of the town of the same name, and includes the greater part of the former villages of Kingston (pop. in 1870, 6,315), incorporated in 1805, and Rondout (pop. in 1870, 10,114), incorporated in 1849, and the unincorporated village of Wilbur. The first permanent settlement was made soon after 1665. The first state convention of New York adjourned from Fishkill to Kingston in February, 1777, and here framed the first constitution of the state. In September following the state legislature met here, but dispersed on the approach of a British force under Sir Henry Clinton, which on Oct. 17 plundered the village and burned every house but one.

**KINGSTON**, a city, port of entry, and the capital of Frontenac co., Ontario, Canada, situated at the head of the St. Lawrence river, where it issues from Lake Ontario, and at the mouth of Catarauqui creek, 175 m. W. S. W. of Montreal, and 150 m. E. by N. of Toronto; pop. in 1844, 6,840; in 1861, 13,743; in 1871, 12,407. The apparent decrease is due to the removal of the garrison. The city is regularly laid out, the streets crossing each other at right angles. Most of the houses are built of

blue limestone, which is quarried in the vicinity. Water is supplied partly from the river and partly from wells, some of which are impregnated with mineral substances, and the city is lighted with gas. There are many fine public buildings, among which are the city hall and market, the custom house, the court house and jail, the post office, and the mechanics' institute. The Grand Trunk railway passes within 2 m. of the city, and a freight branch extends to the harbor. A railway is in course of construction to Pembroke, 120 m. N. The harbor is deep and commodious, and is protected by Wolfe and Garden islands, which lie opposite the city at a distance of 3 m. On the west is the entrance to the bay of Quinté, and on the east the terminus of the Rideau canal, which connects the port with Ottawa. Haldimand cove, E. of the city, between Point Frederick or Navy Point and Point Henry, forms a deep and well sheltered



Kingston, Canada

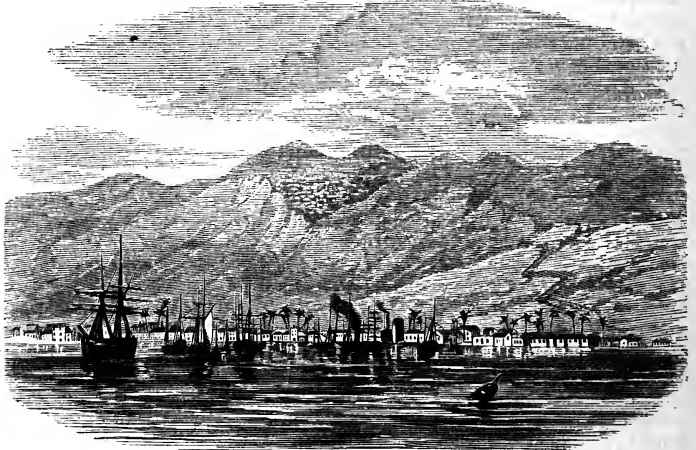
haven. On both these promontories there are fortifications which command the whole harbor. Fort Henry is the principal work of defence; there are several martello towers near it, and as a military post Kingston is the strongest place in Canada after Quebec and Halifax. Steamers ply to Cape Vincent, N. Y., on the opposite bank of the St. Lawrence. The number of vessels entered from the United States for the year ending June 30, 1873, was 2,009, with an aggregate tonnage of 380,665; cleared for the United States, 1,655 vessels of 269,299 tons. The value of imports was \$3,978,459; of exports, \$1,358,202, making Kingston the second port of the province in the value of foreign commerce. Ship building and boat building are largely carried on, and there is a marine railway for repairing vessels. The other principal manufactures are of iron castings, mill machinery, steam engines, locomotives, leather, soap and candles, boots and



shoes, wooden ware, brooms, pianos, ale and beer, &c. There are three branch banks, and a loan and trust company. Kingston is divided into seven wards, is governed by a mayor, board of aldermen, and common council, and has a fire department and a police force. Among the charitable institutions are the house of industry, orphans' home, general hospital, Hôtel-Dieu hospital and orphan asylum, and house of refuge. The provincial penitentiary is about a mile W. of the city, and beyond the penitentiary is the Rockwood lunatic asylum. It is the seat of Queen's university and college (Presbyterian), with seven professors, and having an observatory connected with it; of Regiopolis college (Roman Catholic); and of a medical college, with 11 professors. There are 10 academies and schools, a diocesan library, two daily and two weekly newspapers, and 17 churches, including the Roman Catholic cathedral.—Kingston is one of the oldest places in Ontario. A settlement was begun here by the French as early as 1672, under the name of Fort Cataraqui, which was subsequently changed to Fort Frontenac. The fort was destroyed by an expedition under Col. Bradstreet in 1758, and in 1762 the place fell into the hands of the British, from whom it received its present name. It became a city in 1838, and from 1841 to 1844 was the capital of Canada.

**KINGSTON**, a maritime city and the capital of the island of Jamaica, in the county of Surrey, on the S. coast, 12 m. E. N. E. of Spanish Town, the former capital; lat.  $18^{\circ}$  N., lon.  $76^{\circ} 50'$  W.; pop. about 35,000. It is situated on the gentle slope of a branch of the Blue mountains, and stands on the N. shore of a magnificent bay defended by two forts. It is built in the form of an amphitheatre, with wide and regular streets; the houses, mostly of two stories, are solidly constructed of brick or wood, and painted green and white. The houses in the centre of the city form blocks or squares, and in the principal streets are furnished with verandas below and covered galleries above; while those in the outskirts are detached, and surrounded by delightful gardens. Besides the English church, the handsomest in the town, there are a Scottish, some Methodist, and several Roman Catholic churches, and two synagogues; but neither these nor the other public edifices, such as the theatre, hospital, courthouse, new penitentiary, workhouse, commercial subscription rooms, barracks, and jail,

possess any architectural beauty. The bay or roadstead has a mean depth of six fathoms, and affords good mooring ground for 1,000 vessels of any size. It is bounded S. by a long and narrow strip of land named the Palisades, on the extreme point of which stands Port Royal, the naval station; but the entrance is considerably narrowed by a sand bank stretching in front of Fort Augusta, and the shelter is imperfect, owing to the lowness of the coast. The environs are covered with fine sugar plantations, interspersed with picturesque villas. The region to the west is extremely marshy, and to the east rises Long mountain. The climate is hot, and generally unhealthy for Europeans; the thermometer ranges from  $70^{\circ}$  to  $95^{\circ}$ ; but alternate sea and land breezes in the morning and evening temper in a measure the almost suffocating atmosphere. The situation of Kingston, between Europe and the centre of the American continent, has rendered it an



Kingston, Jamaica.

important commercial entrepot. The chief exports are coffee, sugar, tobacco, dyewood, and its highly esteemed rum; and the imports mainly consist of manufactured goods, flour, wine, ale, and salted meat. The total value of the exports for the year ending Sept. 30, 1870, was \$6,315,813; of the imports, \$6,600,146. It is connected by rail with Spanish Town.—Kingston was founded in 1693, after the destruction by earthquake of Port Royal; it was made a bishopric in 1856. In February, 1782, the town was almost completely destroyed by fire; and another disastrous fire which commenced on March 29, 1862, and in which a few persons perished, destroyed property to the value of \$1,250,000. Yellow fever has at times committed fearful ravages here; and about one eighth of the population was carried off by cholera in 1850.

**KINGSTON**, a town of England. See KINGSTON-UPON-THAMES.



**KINGSTON, Elizabeth Chudleigh**, duchess of, born in 1720, died near Paris, Aug. 28, 1788. Her father, Col. Chudleigh, governor of Chelsea college, died when she was very young, leaving his family in narrow circumstances. As she grew up, her beauty and vivacity attracted much attention; and in her 18th year, by the influence of Mr. Pulteney, afterward earl of Bath, she was appointed a maid of honor to the princess of Wales, the mother of George III. At the princess's court in Leicester house she became one of the reigning toasts of the day, and among her numerous admirers was the duke of Hamilton, whose proposals of marriage she accepted, with the understanding that the nuptials should be celebrated on his return from a visit to the continent. During his absence Capt. Hervey, grandson of the earl of Bristol, became enamored of her, and with the assistance of her aunt, Mrs. Hanmer, who intercepted the letters addressed by the duke to Miss Chudleigh, succeeded in alienating her affections from his rival and in persuading her to be secretly married to himself. The day after the marriage, which took place Aug. 5, 1744, she conceived so violent a dislike for her husband that she resolved never to see him again. The duke of Hamilton soon after returned to England, and was naturally astonished that his claim to her hand should be rejected. To escape his reproaches, and those of her mother, who was a stranger to her marriage, at her apparently unreasonable rejection of this and other advantageous offers, she visited the continent, where she pursued a career of scandalous dissipation. During a residence at Berlin Frederick the Great paid her marked attentions, and at Dresden the electress loaded her with presents. Returning to England, she resumed her duties at the court, and became one of the leaders in the fashionable profligacy of the age. The marriage with Capt. Hervey, however, perpetually annoyed her, and in order to destroy all evidences of it she contrived to tear the leaf out of the parish register in which it was recorded. The death of her husband's grandfather, the earl of Bristol, having improved his prospects of succeeding to the earldom, she obtained the restoration of the leaf. Meanwhile the duke of Kingston, ignorant of her marriage, solicited her hand; and having prevailed on her husband to allow a divorce by mutual consent to be pronounced at doctors' commons, she was married a second time, March 8, 1769. The duke died four years afterward, leaving her in possession of a princely fortune on the condition that she should not again marry. Forthwith she plunged into a course of licentiousness, the censure excited by which constrained her to leave the country for a time. She sailed for Italy in her own yacht, and while living in Rome in great magnificence learned that the family of the duke of Kingston were about to establish against her a charge of bigamy on the ground that her first marriage had been declared void

by an incompetent tribunal. Her banker, who was in the interest of her adversaries, refused to advance her money to leave the country, whereupon she proceeded to his residence, pistol in hand, and extorted it from him. Upon arriving in England she found public opinion strongly against her. Foote satirized her in his "Trip to Calais," under the name of "Kitty Crocodile," which however she found means to have prohibited; but, with a vindictiveness which nothing could appease, she caused some outrageous charges to be trumped up against him, the mortification attending which so affected him that he died soon after. On April 15, 1776, the trial of the duchess came on in Westminster hall, which had been fitted up with great state for the purpose, and during the five days that it lasted attracted members of the royal family and throngs of distinguished persons. The duchess, attended by numerous counsel, addressed the peers with great energy, but was declared guilty. Thereupon she pleaded the privilege of the peerage, having now virtually become the countess of Bristol, to which title her first husband had succeeded, and thus escaped the punishment of burning on the hand, with which Dunning had threatened her. She retained her fortune, however, and the utmost efforts of her opponents were powerless to affect the validity of the late duke's will. Thenceforth she became a voluntary exile, visiting various European courts, and among others that of Catharine II. of Russia, who received her with great kindness. She ended her days at her château in the neighborhood of Paris.

**KINGSTON-UPON-THAMES**, a municipal borough, town, and parish of Surrey, England, on the E. bank of the Thames, at the mouth of the Ewell, 8 m. W. S. W. of London; pop. of the borough in 1871, 15,257. It extends about  $1\frac{1}{2}$  m. along the river, is irregularly built, and contains several interesting edifices, among which are an ancient cruciform church and a handsome town hall. In 1872 there were 18 places of worship, of which 8 belonged to the church of England. There are several endowed schools. A Roman town or station was built on the site now occupied by Kingston, and various traces of it, such as coins and other antiquities, have been brought to light. A great ecclesiastical council was held here by Egbert in 888, and many Saxon kings were crowned here.

**KINGSTOWN**, a seaport and watering place of Ireland, in the county and 7 m. by railway S. E. of the city of Dublin, on Dublin bay; pop. in 1871, 16,387. It possesses, in the words of the tidal commissioners' official report, "one of the most splendid artificial ports in the United Kingdom." The harbor of refuge, begun in 1816, from designs by Rennie, consists of two piers and a breakwater, the E. pier being 3,500 ft. long, and the W. 4,950 ft., with an entrance 850 ft. wide, and enclosing an area of 250 acres, with a depth of water of from 15 to 27 ft.; it cost £750,000. A revol-

ing light marks the entrance, lat.  $53^{\circ} 18' N.$ , lon.  $6^{\circ} 8' W.$  Kingstown is the mail packet station for communication with Dublin and Holyhead. Over 2,000 ships enter and leave the harbor annually.

**KINGTECHIN**, a town of China, in the province of Kiangsi, 100 m. N. E. of Nantchang; pop. upward of 500,000. It is an open town, containing thousands of furnaces and hundreds of factories of porcelain, the manufacture of which centres here. These works have enjoyed the special patronage of the emperors of China for more than 800 years. Stanislas Julien translated from the Chinese a history of the Kingtechin manufacture of porcelain (Paris, 1856).

**KING WILLIAM**, an E. county of Virginia, bounded N. E. by Mattapony river and S. W. by the Pamunkey; area, 270 sq. m.; pop. in 1870, 7,515, of whom 4,455 were colored. It has a rolling surface and a good soil. The Richmond and York River railroad passes through the S. E. part. The chief productions in 1870 were 68,256 bushels of wheat, 236,530 of Indian corn, 33,030 of oats, 17,045 of Irish and 8,309 of sweet potatoes, 28,850 lbs. of tobacco, and 37,095 of butter. There were 805 horses, 2,679 cattle, 1,083 sheep, and 3,856 swine; 6 flour mills, and 2 saw mills. Capital, King William Court House.

**KINIC ACID**, also called cinchonic and quinic acid, a substance obtained in combination with lime in evaporating the infusion of Peruvian bark to a solid consistence, and treating the extract with alcohol. If an aqueous decoction of cinchona bark be mixed with milk of lime until it assumes a feebly alkaline reaction, the vegetable bases and the tannic acid are precipitated, and calcic quinate remains in the liquid; this salt may be crystallized from the mother liquor by evaporation, and decomposed by the cautious addition of oxalic or of sulphuric acid. The kinic acid may then be obtained in crystals from the solution in the form of transparent, colorless, rhomboidal plates. These have a sour taste, and readily dissolve in water or alcohol. Their composition is expressed by the formula  $H_2C_6H_7O_6$ . By combining the acid with cinchonia or quinine it is restored to the saline condition in which it existed in the bark, and may thus be applied in medicine in concentrated form more nearly representing the peculiar character of the bark than in the ordinary combinations of the alkaloid with sulphuric or other mineral acid, although the therapeutic advantage of such a combination is by no means proved. Kinic acid by its presence serves to distinguish genuine barks. The method of testing is to boil  $\frac{1}{2}$  oz. of bark with a little lime, and, after pouring off and concentrating the liquor, to commence distilling it in a retort with a mixture of half its weight of sulphuric acid and peroxide of manganese. If kinic acid is present, a volatile substance called kinone or chinone, of yellow color and peculiar odor, the vapor of which is very irritating to the eyes, comes over with the first portions,

and is instantly recognized. The spurious barks having no kinic acid do not afford kinone. It has been ascertained that caffeic acid also yields kinone when treated in the manner above described. Kinic acid is said to have been found in the leaves of *vaccinium myrtillus*. It is converted in the system into hippuric acid.

**KINKEL, Johann Gottfried**, a German poet and patriot, born at Oberkassel, Aug. 11, 1815. The son of a clergyman, he studied theology and afterward philosophy, and particularly the history of art, holding professorships in each branch at the university of Bonn (1837-'48). Implicated in the revolutionary movements of 1848 and 1849, he was sentenced to 20 years' imprisonment in the fortress of Spandau. In 1850 he effected his escape with the assistance of Karl Schurz and some other devoted friends, fled to England, spent some time in the United States, and returned to London, where he engaged in teaching, lecturing, and journalism. In 1866 he was appointed professor of the history of art at Zürich. He has written lyrical poems, books on the fine arts, especially on Christian art, and miscellaneous works. New editions of his poems, in two collections, and of a number of his stories, were published at Stuttgart in 1874. He married the divorced wife of the publisher Mathieux of Cologne, who was the daughter of Prof. Mockel, and was an accomplished musician and writer on music and other subjects. She lost her life Nov. 17, 1858, by falling or throwing herself out of a window. Her posthumous works include *Hans Ibeles in London* (2 vols., 1860; 2d ed., 1874).

**KINKAJOU**. See POTRO.

**KINNEY**, a S. W. county of Texas, separated from Mexico by the Rio Grande, and drained by numerous small tributaries of that river; area, 1,400 sq. m.; pop. in 1870, 1,204, of whom 418 were colored. There is little good land, which is confined to the valleys of the Rio Grande and a few small creeks. In 1870 it produced 17,820 bushels of Indian corn. There were 15,935 cattle and 6,518 sheep.

**KINO** (sometimes incorrectly called gum kino), a name applied to various astringent vegetable extracts. These are obtained from several distinct regions, and from trees not only of different genera but of different orders, agreeing, however, in the essential characteristic of containing a large proportion of tannic acid, with more or less resin, gum, and extractive. It occurs in small fragments, or even powder, and is usually of a reddish color, with little or no odor and a bitterish astringent taste. The tannic acid which it contains is of the variety which precipitates the salts of iron a greenish black or olive color. By some chemists this kino-tannic acid is supposed to be not a distinct variety, but a combination of ordinary or gallo-tannic acid with a red coloring matter called kinic acid. Among the principal varieties are the East India kino, from the *pterocarpus marsupium*, a lofty leguminous tree

growing upon the mountains of India. This contains 95 per cent. of tannin and extractive, and 24 of red gum. West India or Jamaica kino is believed to be the product of *coccoloba uvifera*, or seaside grape, a small tree of the order *polygonaceæ*. It is possible that the same plant is the source of the South American kino. The African kino, although it is the variety to which the name was first applied, is no longer in the market. The butea gum from the dhah tree of India has been mistaken for it, and has a similar composition. Botany Bay kino is the concrete juice of *eucalyptus resinifera*, the brown gum tree of Australia, a large and lofty tree of the order *myrtaceæ*. It is said that a single tree is capable of furnishing 500 lbs. of kino in one year.—Kino is used in medicine as a powerful astringent, both internally and externally. It may be employed in the form of powder, infusion, or tincture. The last named preparation is apt to gelatinize and lose its astringency when too long kept and exposed to the air. The dose of the powder is from 10 to 30 grains; of the tincture, a teaspoonful; of the infusion, 2 or 3 oz. It is chiefly used medicinally in the treatment of diarrhœa. Passive hæmorrhages are sometimes controlled by it.

**KINROSS-SHIRE**, a S. E. county of Scotland, bordering on Fifeshire and Perthshire; area, 77 sq. m.; pop. in 1871, 7,208. Loch Leven, covering an area of 3,300 acres, and abounding in fish, occupies the centre of the county. The remainder of the surface is level and well cultivated. Its minerals are coal, limestone, and iron. The chief towns are Kinross and Milnathort, which with some manufacturing villages produce plaids, shawls, &c.

**KINGSALE**, a maritime town and parliamentary borough of Ireland, in the county and 12 m. S. by W. of the city of Cork, on the estuary of the Bandon; pop. in 1871, 5,248. It has an Episcopal and a Roman Catholic church, a convent, a Carmelite friary, two Methodist meeting-houses, a town hall, prison, workhouse, and barracks. It is chiefly supported by the resort of summer visitors and the fisheries. A railway connects it with Cork.

**KINSKY**, the name of a noble family of Bohemia, dating from the 14th century. Count FRANZ ULRICH (1634-1799), his brother WENZEL NORBERT OCTAVIAN (1642-1719), and the son of the latter, FRANZ FERDINAND (1678-1741), were prominent statesmen and diplomatists in the Austrian empire. Count FRANZ JOSEPH (1739-1805) distinguished himself in the seven years' war, in the war against Turkey (1788), and against France (1793-'6), and rose to the highest rank in the Austrian army. A new edition of his writings on military science was published in 1806-'25 (6 vols., Vienna). The present head of the junior and princely branch is FERDINAND BONAVENTURA, Prince Kinsky of Wehinitz and Tettau, born Oct. 22, 1834.

**KIOTO** (often called *Miako*, the native equivalent of the Chinese *Kioto*, capital, the real

name being HEIAN or HEIANJO), a city and long the capital of Japan, in the S. W. part of the main island, on the Kamogawa, 235 m. S. W. of Tokio (Yedo), and 25 m. N. E. of Ozaka; pop. in 1872, 567,334. It is one of the three *fu* or imperial cities of Japan. It is in a broad plain encircled by mountains which are covered with groves, gardens, temples, and pagodas. The Kamo, which flows through the city, is a stream of pure water crossed by numerous wooden bridges and a magnificent one of iron erected in 1873. The river bed is in a large extent dry in summer, and the people use it as a pleasure ground. The houses, mostly of one story, are very neat; the streets, which run at right angles, are exceedingly clean, and through many of them flow streams of pure water. It is especially famous for its temples. There are numerous monasteries and nunneries in the city, which in 1872 contained 2,413 Shinto shrines and 3,514 Buddhist temples. The now deserted palace of the mikado and the dwellings of the kugé or court nobles lie in a space enclosed by a wall of tiles and plaster, painted in longitudinal stripes of buff and white. The castle of Nijo, formerly belonging to the shogun (tycoon), is in the central part of the W. side of the city, and is now used as the town hall. Kioto is famous for its manufactures of lacquered articles, silk stuffs, porcelain, metal vases and ornaments, and decorated weapons. It contains a school of foreign languages and sciences, besides many native schools. It is connected with Tokio and Nagasaki by telegraph. The railway to Ozaka is not yet finished. Its importance as a literary centre has passed away.—From the earliest period, the capital of Japan has been fixed near or in Kioto, though it was not made the permanent capital till A. D. 794. So universally was it looked upon as the political as well as the literary and ecclesiastical centre of the empire, that the five adjacent provinces were named the *Kinai*, or home provinces, and the other portions of the empire were divided and named with reference to their direction from it, and the methods of communication by road and canal were arranged with regard to it. In 1864 a conflict, which lasted for several days, took place in and around the mikado's palace, during which nearly the whole city was burned. In 1868 the mikado took up his permanent residence in Yedo, which was thereupon called Tokio (eastern capital), while Kioto was named Saikio (western capital), a name which it now popularly retains.

**KIOWA**, a S. W. county of Kansas, recently formed, and not included in the census of 1870; area, 900 sq. m. Its N. W. corner is intersected by the Arkansas river, and it is watered by several streams.

**KIOWAS**, or *Kioways*, a tribe of North American Indians belonging to the Shoshonee family. They were first brought to notice by Lewis and Clark. Their skin lodges and hunting grounds were then on the Paducah, and with the Kas-

kaias they occupied the head waters of the Platte and Arkansas. They raised horses and traded with the Ricarees, Mandans, &c. They had obtained horses at an early period from the Spaniards, and committed frequent depredations, being great warriors and fine horsemen, though awkward on foot. They were at war with many northern tribes, especially the Pawnees, Tetans, and Sioux. They were noted for the long hair of the men, often reaching to the knees, but done up in three or four plaits, while the women were cropped short. They long hunted on the Platte, and in summer pursued the buffalo between the North fork of the Canadian and the Arkansas, but in autumn and winter pastured their immense herds on the rich grassy bottoms of the Red river. As late as 1819 they used the bow and arrow, lance and war club, and carried shields. They lived in leathern lodges, transported as they moved. The early estimates of their numbers were low, but about 1840 they were 1,800 strong. In 1839 a delegation visited St. Louis. In 1843 government made several attempts to negotiate with them, especially to liberate the white captives in their hands. There was, however, little intercourse with them till the treaty of Fort Atkinson, July 27, 1853, when for a ten years' annual payment of \$18,000 they agreed to refrain from all hostilities. They, however, resumed their depredations, and in 1858 Tohanson, or Little Mountain, defied the whites to punish them. In 1859 the Texans drove them out, and they retired between the Canadian and Arkansas rivers. The government withheld the annual payments in 1859-'60, but they made raids on Texas in retaliation. In October, 1865, a new treaty was made with the Comanches and Kiowas, Tahanson, Santanta or Sitting Bear, Black Eagle, and Lone Wolf being the principal chiefs. They claimed all the territory from the North fork of the Platte to Texas. The object was to induce them to give up their lands and take a reservation on receiving an annual payment proportioned to their numbers. The treaty of August, 1869, assigned to them and some Comanches and Apaches 3,549,440 acres in the southwest of Indian territory, on lands leased from the Chickasaws. They numbered at this time 1,928, but were restive, complained of being fed on Indian corn, and took no interest in agriculture, trampling down their own corn fields. In 1870 they killed several whites near the agency, and invaded Texas. The next year, in May, Santanta led a war party to Texas, which captured a train, killing many. Government then acted decisively. Santanta and Big Tree were arrested, and sent to Jacksborough, Texas, where they were convicted of murder and sentenced to death. This was commuted to imprisonment for life. The tribe, humbled at first, gave up horses and mules; but recovering somewhat, they threatened new raids if Santanta was not restored. At the request of the federal government Texas par-

doned the chiefs, but their hostility continued unabated. Under the treaty of 1867 they have 25 instalments of \$30,000 and \$7,500 for clothing, seeds, blacksmith, &c.; but they are very turbulent and unsettled. Their number was reported in 1873 as 2,000, and their property was estimated at \$200,000.

**KIP, William Ingraham**, an American bishop, born in New York city, Oct. 3, 1811. He studied at Rutgers college, N. J., and graduated at Yale in 1831. He first studied law, and then theology at the general theological seminary of the Episcopal church in New York, and was ordained a deacon in 1835. After some ministerial work in Morristown, N. J., and New York city, he became in 1838 rector of St. Peter's church in Albany, N. Y. In October, 1853, he was consecrated missionary bishop of the Pacific coast, and soon after bishop of the diocese of California, which post he still retains (1874). Besides numerous contributions to church periodicals, he has published "The Lenten Fast" (1843); "The Double Witness of the Church" (1844); "Christmas Holidays in Rome" (1845); "Early Jesuit Missions in North America" (1846); "Early Conflicts of Christianity" (1850); "The Catacombs of Rome" (1854); and "Unnoticed Things of Scripture" (1868). Most of these works have passed through several editions and been republished in England.

**KIPPIS, Andrew**, an English clergyman, born in Nottingham in 1725, died in London in 1795. He was educated at Northampton, in the theological seminary of Dr. Doddridge, and, after being a Unitarian pastor for some years at Boston in Lincolnshire and Dorking in Surrey, he removed in 1753 to London, where he became minister of the Unitarian chapel of Prince street, Westminster. In 1763 he became classical and philological master of Coward's theological academy, and he held a similar chair in the Unitarian institution at Hackney. His most important works are his edition of the "Biographia Britannica," which he commenced in 1777, and of which he published 5 vols.; and a "Life of Captain James Cook" (2 vols. 8vo, 1788). He also edited the works of Dr. Nathaniel Lardner and Dr. Doddridge.

**KIPTCHAK, or Kaptchak**, the name of one of the oldest Mongolian or Tartar races, and also that of the lands of S. E. Russia and W. Asia which they inhabited. Oriental authors, as Rashid ed-Din and Abulghazi Bahadur Khan, relate that while Oghuz Khan, a descendant of Turk, a son of Japhet, was fighting a bloody battle with the Kara Khatia, the wife of a general of the latter hid in a hollow tree (*kiptchak*) and gave birth to a child, who became the forefather of the horde, and the founder of the empire called Kiptchak. The Deshti Kiptchak, or desert of Kiptchak of the eastern writers, the home of many roaming tribes in the middle ages, comprised the vast steppes on the lower courses of the Dnieper, Don, Volga, and Yaik or Ural, and between the Black and Caspian

seas. In the first half of the 13th century the Mongolians founded the khanate of Kiptchak, which was synonymous with the empire of the Golden Horde, and reached from the interior of European Russia to the sources of the Sir Darya or Jaxartes. About the middle of the 15th century, after Tamerlane's invasion, Kazan, Astrakhan, and Krim or Crimea fell off from Kiptchak, and formed independent khanates. Of these the first two were soon after absorbed by Russia, but the Crimea first became subject to the Ottomans, and was not annexed by Russia till the end of the 18th century. (See MONGOLIANS.)

**KIRBY, William**, an English naturalist, born at Withnesham, Suffolk, Sept. 19, 1759, died at Barham, July 4, 1850. He graduated at Caius college, Cambridge, in 1781, took orders, and was appointed to the curacy of Barham. At the end of 14 years he became the rector of the parish. In 1802 appeared his *Monographia Apium Angliæ* (2 vols., Ipswich), the first scientific English work of its class. Several years later he joined Mr. Spence of Hull in a project for preparing a popular treatise on entomology, the result of which was the publication in 1815 of the first volume of "Kirby and Spence's Introduction to Entomology;" the second volume appeared in 1817, and the third and fourth in 1826. In 1830 he produced a Bridge-water treatise on the "Habits and Instincts of Animals with reference to Natural Theology," and he subsequently wrote the description of insects in Sir John Richardson's *Fauna Boreali-Americana*, besides several minor works. His biography was written by the Rev. John Freeman (London, 1852).

**KIRCHER, Athanasius**, a German scholar, born near Fulda, Hesse-Cassel, May 2, 1602, died in Rome, Nov. 28, 1680. He was educated at the university of Würzburg, where he afterward taught philosophy and the oriental languages. After the invasion of Franconia by the Swedes in the thirty years' war he retired to France, and passed two years in the Jesuits' college at Avignon. He then went to Rome, where he was for eight years professor of mathematics. His most important works are: *Prodromus Coptus sive Ægyptiacus* (Rome, 1636); *Lingua Ægyptiaca Restituta* (1644); and *Latium* (Amsterdam, 1671), with valuable maps and plans. He was a voluminous writer on mathematical and physical science, and his *Mundus Subterraneus* (2 vols., 1664-'8) comprises all the geological knowledge of the day. He made many philosophical inventions, and collected a celebrated museum of instruments, models, natural objects, and antiquities, for the Jesuit college at Rome. This was described by Sepi (Amsterdam, 1679), and by Buonanni under the title *Museum Kircherianum* (fol., Rome, 1709; new ed. by Battara, 1773).

**KIRCHHEIM**, or **Kirchheim-unter-Teck**, a town of Württemberg, on the Lauter, and not far from the Teck, 18 m. S. W. of Ulm; pop. in 1871, 5,863. It has a royal castle, a large hos-

pital, a house of refuge, iron works, and a sulphur spring. Linen, cotton goods, musical instruments, and other articles are manufactured; and there are important wool, sheep, and cattle markets.

**KIRCHHOFF, Gustav Robert**, a German physicist, born in Königsberg, March 12, 1824. In 1845 he published an essay on the passage of the electric current through planes. He graduated at Königsberg in 1846, and in 1848 began lecturing in Berlin on mathematical physics, and published several elaborate articles on electrology. In 1850 he was appointed lecturer on experimental physics at Breslau, and in 1854 professor of natural philosophy at Heidelberg, which chair he still occupies (1874). Between 1850 and 1858 he published numerous articles on magnetism, electricity, heat, and the tension of vapors; and in 1859 he made the discovery which has rendered him famous, the cause of Fraunhofer's lines in the solar spectrum. Euler a century ago, and in later years Talbot, Miller, Wheatstone, Foucault, Angström, Balfour Stewart, and Tyndall, had all been very close upon the discovery; but Kirchhoff (in Poggendorff's *Annalen*, vol. cix., p. 275), was the first to propound and demonstrate the law: "The relation between the power of emission and the power of absorption of one and the same class of rays is the same for all bodies at the same temperature." This was the basis of his invention in 1860, in conjunction with R. W. Bunsen, of the new method of qualitative chemical analysis called spectrum analysis. (See SPECTRUM ANALYSIS.) He published *Untersuchungen über das Sonnenspectrum und die Spectren der chemischen Elemente*, which contains his views of the physical constitution of the sun (Berlin, 1861; 3d ed., 1866); and with Bunsen, *Chemische Analyse durch Spectralbeobachtung* (Vienna, 1861). He and Bunsen together, by means of spectrum analysis, discovered two new metals, cesium and rubidium. In 1870 Kirchhoff became a foreign member of the Berlin academy of sciences; and subsequently the Prussian order *pour le mérite*, the highest honor of its kind in Germany, was conferred upon him. Recently he has begun the publication of what is designed to be an elaborate work on mathematical physics. The first part bears the title, *Vorlesungen über analytische Mechanik, mit Einschluss der Hydrodynamik und der Theorie der Elastizität fester Körper* (Leipsic, 1874).

**KIRCHHOFF, Johann Wilhelm Adolf**, a German philologist, born in Berlin, Jan. 6, 1826. He is a son of the historical painter Johann Jakob Kirchhoff. After teaching in a gymnasium, he became in 1865 a professor in the university of Berlin, and in 1867 succeeded Böckh as a director of the philological seminary. His works include editions of Plotinus (2 vols., Leipsic, 1854) and Euripides (2 vols., 1855, and 3 vols., 1867-'8), *Die homerische Odyssee und ihre Entstehung* (1859), and *Die Composition der Odyssee* (1869). He is a high



authority on the old Italic languages and on palæography. For the academy of sciences he edited part of the *Corpus Inscriptionum Græcarum* (1859), containing the Christian inscriptions, and *Corpus Inscriptionum Atticarum* (1872 *et seq.*).

**KIRGHIZ**, Kirghises, or Kirghiz-Kazaks, a nomadic people of Asiatic Russia, occupying a region called the Kirghiz steppes, which extends from the Caspian sea to the Russian-Chinese frontier at the Altai mountains, and from the sea of Aral to the Tobol and the Ir-tish. Their former abodes were further east. Since the recent political reconstruction of Siberia and central Asia there are three divisions of Kirghiz steppes: those of Orenburg, of West Siberia, and of Turkistan. The Russian government estimates all the Kirghiz at 1,286,000, occupying an area of 856,000 sq. m. The Kirghiz are divided into the Little, Great, and Middle hordes, which are politically independent of each other. They are subject to Russia, and the dignity of khan has been disallowed among them as a title of authority. They belong to the Turco-Tartaric race, but their physiognomy betrays a large admixture of more eastern blood. They resemble the Uzbecks, speak the same language, and profess to be related to them. Their stature is under the middle size, their countenance disagreeable, their eyes deep set and elongated, and their cheeks large and bloated; the women are, however, rather pretty and delicately formed. The men, though not muscular, are hardy and vigorous. Their chief occupation is tending sheep, goats, horses, and camels. They have a few domestic manufactures, but on the whole are one of the most barbarous races of Asia, and the efforts of the Russian government to gather them into towns and teach them the arts of civilization have met with no success. A large share of the outdoor as well as domestic labor is left to the women. The dress of the men consists of one or more loose frocks, wide trousers, colored boots, a girdle, and a conical felt hat in summer or a furred cap in winter. That of the women is nearly the same. The more wealthy wear silks, sometimes finely embroidered. Their dwellings, called *yurts*, consist of huts made of willow trellis work covered with a kind of sheeting of wool and camels' hair. Mutton, horse flesh, tea, and sour mares' milk are the principal articles of diet. The Kirghiz were formerly the chief slave catchers of the steppes, and a brother sometimes sold his sisters into servitude in order to avoid the expense of their support. The slaves were sent to Khiva, Bokhara, and other Turkoman states; but recently the influence of Russia has caused the abolition of slavery in these states. The religion of the hordes is a corrupt form of Mohammedanism. There are kindred tribes in East Turkistan, sometimes designated as the eastern Kirghiz. — See Atkinson's "Oriental and Western Siberia." Nicholas Ilminski, professor at the university of Kazan, published in 1861, in

Kirghiz, a manual of the Russian language, and in 1862 the Kirghiz text of the legend of the popular hero Targun, and a grammar and dictionary in one volume, under the title of "Materials for the Study of Kirghiz."

**KIRK**, Edward Norris, an American clergyman, born in New York, Aug. 14, 1802, died in Boston, March 27, 1874. He graduated at the college of New Jersey in 1820, and studied law for 18 months, but afterward entered and graduated at the theological school in Princeton. He was for a time agent in the southern states for the American board of foreign missions, and in 1828 became pastor of a Presbyterian church organized for him in Albany, N. Y. In 1837 he resigned on account of ill health, and visited Europe, preaching in London, and for several months in Paris. Being appointed secretary of the foreign evangelical society, he returned to the United States in 1839, to present the claims of Roman Catholic countries as a field for missionary effort. In 1842 he became pastor of the Mount Vernon church in Boston, which was organized for him, and where he preached till 1871, when his failing health compelled the transfer of active labor to a colleague. In 1856 he visited Paris, at the request of the American and foreign Christian union, for the purpose of establishing American Protestant worship in that city. While assiduous in the duties of his own parish, he was a frequent and most acceptable preacher in other parishes, particularly in times of special religious interest. During his last years he became almost entirely blind; he was active, however, in ministerial meetings, and led an interesting discussion on revivals only four days before his death. He received the degree of D. D. from Amherst college. At the time of his death he was president of the American missionary association. Besides about 30 occasional sermons and addresses, he published two volumes of sermons and a volume of "Lectures on the Parables." He also wrote some short works which were published by the American tract society in Boston, and translated Gausson's *Théopneustie*, a treatise on the inspiration of the Scriptures.

**KIRK**, John Foster, an American author, born in Fredericton, New Brunswick, in 1824. He was educated in Nova Scotia, and took up his residence in the United States about 1842. In 1847 he became secretary to William H. Prescott, whom he continued to assist until the historian's death in 1859. In 1863 he published in London and Philadelphia the first two volumes of his "History of Charles the Bold," the third and concluding volume appearing in 1868. He has contributed several historical and other articles to leading periodicals, and since 1871 has been editor of "Lippincott's Magazine" in Philadelphia. He has prepared a new edition of Prescott's works, embodying emendations left by the author, with original notes.

**KIRKBRIDE**, Thomas S., an American physician, born near Morrisville, Bucks co., Pa.,

July 31, 1809. His ancestors were members of the society of Friends (to which he also belongs), and came to America with William Penn. He received the degree of M. D. from the university of Pennsylvania in March, 1832, and was appointed resident physician of the Friends' lunatic asylum at Frankford, Pa. A year later he was elected resident physician of the Pennsylvania hospital, in which post he continued two years. In October, 1840, he was elected superintendent of the Pennsylvania hospital for the insane, which was opened in January, 1841. He has published "Rules and Regulations of the Pennsylvania Hospital for the Insane" (1850), which has been a text book and guide in the regulations of new hospitals; "On the Construction, Organization, and General Management of Hospitals for the Insane," and "Appeal for the Insane" (1854). He has also been a frequent contributor to the "American Journal of Medical Sciences," and the "American Journal of Insanity." In 1853 he proposed the erection of a new hospital, and the separation of the sexes in two distinct buildings. To carry out his plan he raised \$355,000 in Philadelphia and vicinity; the new hospital was finished in 1859, and Dr. Kirkbride has since given his personal supervision to the female department.

**KIRKCALDY**, a parliamentary burgh and seaport of Fifeshire, Scotland, 13 m. N. of Edinburgh, on the N. shore of the frith of Forth; pop. in 1871, 12,422. It extends E. and W. along the shore for nearly 2 m. There are bleach fields, jute and linen factories, flour mills, breweries, distilleries, and machine shops. The trade of the port is quite large. The imports are principally from Germany and Egypt, and consist of flax, timber, and corn; the exports are linen, jute, yarn, herrings, and coal. Several free schools have been founded in the towns of this part of Fifeshire through the munificence of Mr. Robert Philp, a merchant of Kirkcaldy, who died in 1829, and left over £70,000 for this purpose.

**KIRKCUDBRIGHT**, a S. W. county of Scotland, bordering on Solway frith, which separates it from the English county of Cumberland; area, 954 sq. m.; pop. in 1871, 41,852. With the county of Wigtown, which adjoins it on the west, and part of Ayr and Lanark, it forms the district of Galloway. Most of the district is hilly, and the N. W. part is mountainous; there are also several high peaks in the south. The principal summits are Blacklarg in the north (2,890 ft. high), Cairnsmoor in the southwest (2,329), and Criffel in the southeast (1,831). The principal rivers are the Dee, Fleet, Ken, and Urr. Small lakes are numerous. About one third of the soil is capable of cultivation, and when properly manured is very fertile. Cattle of the famous Galloway breed are largely exported. The small Galloway horses were formerly reared here, but have been almost wholly replaced by a larger breed. The county is noted for

excellent honey. Kirkcudbright is commonly called a stewartry instead of a shire, and has an officer termed a steward, whose duties correspond to those of a sheriff in other counties.

—**KIRKCUDBRIGHT**, the capital, is a seaport on the Dee, 6 m. from its confluence with the Solway frith, and 25 m. S. W. of Dumfries; pop. in 1871, 2,470. It has few manufactures, but considerable trade in agricultural produce.

**KIRKE**, Sir David, an English colonial adventurer, born in Dieppe, France, in 1596, died at Ferryland, Newfoundland, in the winter of 1655-'6. He was the oldest son of Gervase Kirke, an English merchant who carried on business for many years at Dieppe, and married there. David went into business as a wine merchant at Bordeaux and Cognac, but during the Huguenot troubles retired to England. His father became interested in Sir William Alexander's American projects, and sent out three vessels under royal letters of marque in 1627 to break up the French settlements in Canada and Nova Scotia. David Kirke, accompanied by his two brothers, commanded the expedition; he ran up to Tadoussac, and sent parties to burn the houses and kill the cattle at Cape Tourmente, and also summoned Champlain to surrender Quebec. Hearing of the approach of a French squadron under De Roquemont, he prepared to meet it. De Roquemont engaged him near Gaspé, July 18, 1628, but was soon compelled to strike. Kirke thus captured all the stores, ammunition, and arms intended for Quebec. He sailed again with his brothers from England in March, 1629, and in July Champlain was compelled to surrender. Nova Scotia, too, was reduced. These conquests were given up by England in 1632; but Kirke was knighted by Charles I. in 1633, and with others obtained a grant of Newfoundland. He devoted himself to its colonization, and held it till dispossessed by Cromwell, having been governor for nearly 20 years. He recovered part of his property by bribing Cromwell's son-in-law Claypole, and returned to Ferryland in 1653.

**KIRKES**, William Senhouse, an English physician, born about 1820, died in December, 1864. He was physician to St. Bartholomew's hospital in London, and lecturer to the medical college attached to that institution. He is best known as the author of a "Handbook of Physiology," first published in 1848, which passed through several editions in England and was republished in the United States. Among his other most important contributions to medical literature were a series of papers on the "Detachment of Fibrinous Deposits from the Interior of the Heart." His name is in this way closely connected with the subject of embolism, one of the most remarkable and important features of recent pathological science. (See BRAIN, DISEASES OF THE, vol. iii., p. 198.)

**KIRKLAND**, Caroline Matilda (STANSBURY), an American authoress, born in New York in January, 1801, died there, April 6, 1864. She



was married to Prof. William Kirkland of Hamilton college, who established a seminary in Goshen, on Seneca lake, and afterward emigrated with his family to Michigan, whence after a residence of 2½ years they removed in 1843 to New York. Her works include "A New Home: Who'll follow?" (Boston, 1839); "Forest Life" (1842); "Western Clearings" (1846); "Holidays Abroad, or Europe from the West" (2 vols., 1849); "The Evening Book, or Fireside Talk on Morals and Manners, with Sketches of Western Life" (1852); "A Book for the Home Circle" (1853); the letterpress to "The Book of Home Beauty;" and "Personal Memoirs of George Washington" (1858).

**KIRKLAND, John Thornton**, an American clergyman, born at Little Falls, N. Y., in 1770, died in Boston, April 26, 1840. He was the son of Samuel Kirkland, a famous missionary among the Indians, graduated at Harvard college in 1789, and was ordained pastor of the Congregational church in Summer street, Boston, in 1794. He was elected president of Harvard college in 1810, and held this office till 1823, when he was enfeebled by a severe attack of paralysis. Although a writer of great and acknowledged excellence, he could never be induced to undertake an extensive work, but published a number of occasional pamphlets and some biographies. Of these, his life of Fisher Ames (1809) was perhaps the most valuable. He exerted a very great influence during his life, by the force of his intellect and character. He impressed himself strongly upon all with whom he came in contact; and during his presidency the college flourished, both in its internal condition and in its external relations.

**KIRKWOOD, Daniel**, an American mathematician, born in Harford co., Md., Sept. 27, 1814. He was mathematical tutor in the academy of York co., Pa., from 1838 to 1843, when he became principal of the Lancaster high school, and resigned in 1848 to accept a position in the Pottsville academy. In 1849 he communicated to the American philosophical society, at Philadelphia, and to the American association for the advancement of science, at Cambridge, Mass., his then recently discovered analogy between the periods of rotation of the primary planets. In 1851 he became professor of mathematics, and in 1854 president, of Delaware college, resigning in 1856 to take the chair of mathematics in Indiana university at Bloomington. He has been an earnest advocate of the nebular hypothesis. His paper in the monthly notices of the royal astronomical society, vol. xxix., "On the Nebular Hypothesis, and the Approximate Commensurability of the Planetary Periods," applies the theory of Laplace to explain the existence of gaps and chasms in the zone of minor planets between Mars and Jupiter, and assigns a physical cause for the hiatus in Saturn's ring. Noticing this paper, Mr. R. A. Proctor says of Prof. Kirkwood's researches: "I believe they will inaugurate new and im-

portant processes of thought, by means of which the noble and hitherto intractable problems connected with the formation of the solar system may be found capable of solution." Prof. Kirkwood has also published "Comets and Meteors: their Phenomena in all Ages, and their Mutual Relations, and the Theory of their Origin" (Philadelphia, 1873). He received the degree of LL.D. from the university of Pennsylvania in 1852.

**KIRSCHWASSER** (Ger. *Kirsche*, cherry, and *Wasser*, water), an alcoholic liquor distilled from the fermented mash of small and sweet black cherries. In the ordinary rude way of preparing it, it is a rank liquor containing hydrocyanic acid derived from the cherry stones. A superior kind is made in the Black Forest from fruit more carefully selected and treated.

**KIRWAN, Richard**, an Irish chemist, born in county Galway about the middle of the 18th century, died in Dublin in 1812. He was educated at Trinity college, and at the Jesuits' college of St. Omer in France. In 1779 he went to England, and settled near London, where he devoted himself to the study of chemistry and geology. Having been admitted a member of the royal society, he read several valuable papers before that body, for which the Copley medal was awarded to him in 1782. Returning to Ireland in 1789, he was chosen president of the royal Irish academy, and of the Dublin society, and afterward became a member of the principal learned societies of Europe. He was a frequent contributor to the "Transactions" of the various scientific societies of Dublin and London. His most important works are "An Essay on Phlogiston and the Composition of Acids," in which he labors to reconcile the chemistry of the alchemists with that of modern times; "Elements of Mineralogy;" and "Essay on the Analysis of Mineral Waters." Lavoisier translated the first, and appended a refutation of the theory.

**KISFALUDY. I. Károly**, a Hungarian dramatist, born at Tété, in the county of Raab, Feb. 6, 1788, died in Pesth, Nov. 21, 1830. At an early age he entered the Austrian army, served in Italy and in the campaign of 1809 in Germany, and acquired great popularity by a series of national dramas and comedies, such as: *A tatárok Magyarországon* ("The Tartars in Hungary"), *Zách Klára* ("Clara Zách"), *A kérok* ("The Suitors"), *A pártütök* ("The Rebels"), and an excellent comedy, *Mátyás deák* ("The Student Matthias"). **II. Sándor**, elder brother of the preceding, born at Sümeg, Sept. 22, 1772, died there, Oct. 28, 1844. He studied at Raab and Presburg, entered the Austrian army in 1793, served in the wars of Italy and in the campaign of Switzerland, and fought in the battle of Zürich (1799). In 1800 he returned to Hungary, and for about 25 years continued to write poetry, including *Himfy szerelmei* ("The Love of Himfy"), and *Regék* ("Ballads"). Some of his poems have been translated into English by John Bowring.

—The complete works of both brothers have been edited by Schedel (Toldy).

**KISHENEV**, a town of European Russia, capital of the government of Bessarabia, on the Byk, a tributary of the Dniester, 86 m. N. W. of Odessa; pop. in 1867, 103,998. The inhabitants are a motley mixture of Jews, Russians, Roumans, Poles, Greeks, Bulgarians, Armenians, and others. The town occupies a wide extent, and is pleasantly situated. It is the seat of a Greek archbishop, and contains a number of churches, an ecclesiastical college, gymnasium, and library, and manufactories of wool, leather, and soap.

**KISS**, August, a German sculptor, born near Pless, Prussian Silesia, Oct. 11, 1802, died March 24, 1865. He received his early education in Gleiwitz, and at the age of 20 became a pupil of Rauch at the academy of Berlin. His earliest productions were bass-reliefs for churches and other public buildings, groups of nymphs and tritons for fountains or gardens, and the ordinary classical subjects, executed partly from Rauch's designs and partly from his own. The "Amazon and the Tiger," finished in 1839, first brought him into notice. His colossal group of "St. George and the Dragon," exhibited in the French exposition of 1855, was severely criticised. Among his other works are a statue of Frederick the Great at Breslau, two of Frederick William III., "St. Michael overthrowing the Dragon," and a colossal tiger's head in bronze killing a serpent.

**KISSINGEN**, a watering place of Bavaria, in the district of Lower Franconia, on the Saale, 32 m. N. by E. of Würzburg; pop. in 1871, 2,591. It is walled, and has very extensive baths with five mineral springs. Of these the Pandur spring, discovered in the 16th century, has a temperature of 50°, and is chiefly used for bathing; the Ragoeczy, discovered in 1737, has 52°, and is a drinking water; the Max has 50°; the Theresa the same; and the Soelensprudel, 68°, is chiefly used for bathing. The first two springs contain iron, and the others salt. There were 11,000 visitors in 1871. The waters are exported to a considerable extent. A little N. of the town are rich saline springs, from which 1,500 tons of salt are annually made. There is an artesian well, 2,000 ft. deep, which throws up, by the action of a subjacent stratum of carbonic acid gas, a column of water 5 inches in diameter, 76 ft. above the surface, and discharges 96 to 100 cubic ft. per minute. This water is forced down a tube sunk into a stratum of rock salt, and is again thrown 80 ft. above the surface into a reservoir, whence it feeds the salt pans in the boiling house, and yields pure white crystalline salt. The Prussians here gained a victory over the Bavarians, July 10, 1866. An attempt on the life of Prince Bismarck was made here, July 13, 1874, by Kullmann, a cooper.

**KISTNAH**, or Krishna, a large river of S. India, which rises in the Western Ghats, at Mahabulishwar, about 40 m. from the Malabar coast,

and after a S. E. course of about 800 m. discharges its waters by many mouths into the bay of Bengal, near Masulipatam. Its principal tributaries are the Wurna, Malpurba, Gutpurba, Beemah, Toongabudra, and Mussy. It is subject to two periodical risings annually. The first and greatest is caused by the heavy rains of the S. W. monsoon, the other by those of the N. E. monsoon. The Kistnah is connected with the Godavery by a canal 90 m. long, and irrigates the adjacent country by numerous artificial channels. At Boburlanka, in lat. 16° 5' N., lon. 80° 56' E., it divides into two main branches, which diverge from each other in their progress to the sea, and form an extensive delta, intersected by less considerable branches. On account of the rapid declivity and rocky nature of its waterway, the Kistnah can hardly be anywhere navigated even by small craft; but in the lower part it has been made navigable by the government. In its upper course it is usually crossed in large circular bamboo baskets covered with hides. It is richer in gems than any other Indian river.

**KIT CAT CLUB**, a convivial association established in London about the time of the revolution. As its leading members were mostly whigs, it quickly assumed a political character, and came to be regarded as the headquarters of the friends of the Hanoverian succession. It was held in Shire lane, at the house of Christopher (alias Kit) Cat, who supplied its votaries with mutton pies. Addison, Steele, Walpole, Sir Godfrey Kneller, and Marlborough belonged to it. The club was dissolved about 1720. The memoirs of the celebrated members of the Kit Cat club, illustrated with 48 portraits three quarters in length (whence the term Kit Cat portraits) from the original paintings by Sir G. Kneller, were published in London in 1821.

**KITCHNER**, William, an English physician and author, born in London about 1775, died there in 1827. He was educated at Eton. His literary works are of a very miscellaneous character. They embrace treatises on gastronomy, health, the eye, telescopes, and music, together with a collection of the "Loyal and National Songs of England." The "Cook's Oracle" is perhaps the most important of his productions.

**KITE**, the common name of many birds of prey belonging to the subfamily *milvinae*, characterized by moderate size, slender figure, short and weak bill with hooked and acute tip and sinuated margins, nostrils basal and lateral, wings long and pointed, tail long, tarsi slender and rather short, toes moderate, broad, and padded. Many of the genera need only be mentioned here; among them, according to Gray, are *baza* (Hodgs.), from India, its archipelago, and Australia; *aviceida* (Swains.), from W. Africa; *pernis* (Cuv.), including the old world honey buzzards (see BZZARD), of which *P. apivorus* (Selb.) is a well known European representative; *cyindis* (Cuv.) and *gamponyz* (Vigors), from tropical America.—Among the

American kites belongs the genus *nauclerus* (Vig.), with long pointed wings and deeply forked tail. The swallow-tailed kite (*N. furcatus*, Linn.) is about 2 ft. long, with an extent of wings of 4½ ft.; the back, wings, and tail are black, with a metallic lustre, purple on the wing coverts; head, neck, under wing coverts, base of secondaries, and lower parts white; tarsi and toes greenish blue; bill horn color. This species is found in the southern Atlantic states, and in the interior from Texas to Wisconsin; it is accidental in Europe. The flight of this bird is exceedingly graceful and rapid. Flocks of 15 or 20 are often seen; they arrive in the gulf states early in April, probably from Mexico and Central America, and disappear in September; they are shy, on the wing during most of the day, and at night resting on the highest trees; they feed during flight, and in calm weather soar to an immense height in pursuit of large insects; the gait on the ground is very awkward. The nest resembles that of the crow, and is usually placed in the top of a tall tree; the eggs, four to six, are greenish white, with irregular brown blotches at the larger end.—In the genus *elanus* (Sav.), found in the warmer parts of the globe, belongs the white-tailed or black-shouldered kite (*E. leucurus*, Vieill.); the length is about 16 in. and the extent of wings about 3½ ft., in the female; the wings are long and pointed, but the tail is moderate and emarginated; the head, tail, and under parts are white; above light ashy, with an oblong black patch on the shoulder formed by the lesser wing coverts; inferior wing coverts white, with a smaller black patch; the middle tail feathers are light ashy; bill dark; tarsi and toes yellow. It is found in



Mississippi Kite (*Ictinia mississippiensis*).

the southern and western states, and in South America; rarely seen north of South Carolina on the Atlantic coast, it occurs considerably further north on the Pacific. It flies very high, and is not easily approached in its favorite marshy retreats; it feeds on small birds and

large insects, especially orthoptera, and is very bold in their pursuit. The Mississippi kite (*Ictinia mississippiensis*, Wilson), of the southern states, Texas, and New Mexico, a smaller species, approaches nearest to the true falcon. A species of the genus *rostrhamus* (Lesson), generally South American, has been found breeding in Florida; this is the black kite (*R. sociabilis*, Vieill.), remarkable for its slender and much hooked bill; it is about 16 in. long, of a black color, with base of tail and its under coverts white; the young birds are more brownish and yellow; it preys principally on reptiles, and perches on the loftiest trees.—Of the kites of the old world, the best known is the common *milvus regalis* (Briss.) of Europe, of a reddish brown color above, with blackish longitudinal streaks, and the lower parts light brownish red with narrower streaks; the female is about 26 in. long, with an extent of wings of 5½ ft. The flight is remarkably powerful and elegant; the food consists of small quadrupeds, birds, reptiles, insects, carrion, and even fish. It is found in Europe, N. Africa, and W. Asia, in almost all regions, both wild and inhabited; it sometimes steals a young chicken when the hen is off her guard, but dares not make a direct attack in her presence.

**KITSAP**, a N. W. county of Washington territory; area, 400 sq. m.; pop. in 1870, 866. It is a peninsula, having Hood's canal on the west and Admiralty inlet on the east and north. It includes Bainbridge and Blaine islands. The production of lumber is the principal industry. In 1870 there were three planing mills, with an annual production valued at \$588,000, and three saw mills, producing \$520,000 worth of lumber. Capital, Port Madison.

**KITTANNING**, a borough and the capital of Armstrong co., Pennsylvania, situated on a broad alluvial plain on the E. bank of the Alleghany river, and on the Alleghany Valley railroad, 38 m. N. E. of Pittsburgh; pop. in 1870, 1,889. In the hills skirting and opposite the borough are found, nearly horizontal, one stratum of cannel and five of bituminous coal, and two each of iron ore and limestone; also pure fire clay and good building stone. It has gas and water works, and contains three iron foundries, a rolling mill, two flouring mills, a planing mill, a brewery, a tannery, two banks, two schools, three weekly newspapers, and eight churches.

**KITTATINNY**, or *Blue Mountains*, a chain which commences in Ulster co., N. Y., and crossing the N. W. part of New Jersey passes into Pennsylvania, where it forms one of the principal mountain ridges of the state. It is broken by the Delaware river at the Water Gap, by the Lehigh at Wind Gap, by the Schuylkill above Hamburg, and by the Susquehanna about 5 m. above Harrisburg. Between it and the N. branch of the Susquehanna, a distance of about 35 m., is the great anthracite region. Passing out of Pennsylvania, its course is less marked as it approaches the South mountains and the

Potomac, but it may be traced into Alabama, a total length of more than 800 m. Its elevation varies from 800 to 2,500 ft. above the sea.

**KITTERY**, a town of York co., Maine, on the Portland, Saco, and Portsmouth railroad, 42 m. S. W. of Portland, and at the mouth of the Piscataqua river, opposite Portsmouth, N. H., with which it is connected by a bridge and by ferry; pop. in 1870, 3,333. It forms the S. W. extremity of the state, and is chiefly noted as the seat of a United States navy yard. This establishment is situated on an island in the river within the limits of the town, and contains extensive ship houses, machine shops, rigging lofts, wharves, barracks, and a dry dock which cost \$800,000. The town is the birthplace of Sir William Pepperell. It was settled in 1623, and incorporated in 1647.

**KITTIWAKE**. See GULL.

**KITTO, John**, an English Biblical scholar, born in Plymouth, Dec. 4, 1804, died in Cannstatt, Germany, Nov. 25, 1854. He was the son of a mason, and when about 12 years old was rendered incurably deaf by a fall from the roof of a house. Poverty compelled him to enter the workhouse of Plymouth. He was apprenticed to a shoemaker, who treated him so cruelly that his indentures were cancelled and he returned to the workhouse. His love of study procured him admission to a college in Islington, and he soon after published by subscription a small volume of miscellaneous writings. Next he went to Exeter to learn the profession of a dentist; and thence to London, where he was employed in the printing office of the church missionary society. Two years later he went to the society's establishment at Malta, and subsequently he visited Bagdad as a private tutor. There he resided three years, and acquired an intimate acquaintance with oriental life. Soon after returning to London Charles Knight engaged him first as assistant in preparing serials for the "Library of Useful Knowledge," and afterward in the compilation of other works. Having been seized with paralysis, he retired in 1854 to Cannstatt. In 1844 he received the degree of D. D. from the university of Giessen; and the British government granted him in 1850 an annuity of £100. His principal works are: the "Pictorial Bible" (1835-'8; 2d ed. enlarged, 4 vols. royal 8vo, 1847-'9); "Uncle Oliver's Travels" (2 vols. 12mo, 1838); "Pictorial History of Palestine" (2 vols. royal 8vo, 1839-'40); "Cyclopædia of Biblical Literature" (2 vols. 8vo, 1845-'50); "The Lost Senses: Deafness and Blindness" (1845); "Physical Geography of the Holy Land" (2 vols. 18mo, 1848); "Daily Bible Illustrations" (8 vols., 1849-'53). In 1848 he established the "Journal of Sacred Literature," which he edited till 1853. His memoirs have been written by J. E. Ryland (Edinburgh, 1856).

**KITTLITZ, F. H. von**, baron, a German naturalist, born in 1798, died in Mentz, April 10, 1874. He was an officer in the Prussian army,

and a nephew of the Russian field marshal Diebitsch, and made with the Russian captain Lütke a circumnavigation of the globe (1826-'9). He was also a painter and engraver, and published ornithological and other essays, illustrated by himself. In 1870, though then in his 72d year, he took charge of a military hospital. His works include *Vierundzwanzig Vegetationsansichten von den Küsten und Inseln des Stillen Oceans* (Wiesbaden, 1850-'52; new ed., Berlin, 1862 *et seq.*); *Denkwürdigkeiten einer Reise nach dem russischen Amerika, nach Mikronesien und durch Kamtschatka* (2 vols., Gotha, 1858); and *Psychologische Grundlage für eine neue Philosophie der Kunst* (Berlin, 1863).

**KIUKIANG**. See KEWKIANG.

**KIUSHIU, Kiusiu, or Kimo**, a large island of Japan, separated on the north from the main island by a strait  $1\frac{1}{2}$  m. wide, and N. E. from Shikoku or Sikok by a channel 9 m. wide; length 210 m., greatest width about 150 m.; area, about 15,000 sq. m. It is surrounded by inaccessible rocks and shallows, dangerous to navigation, and is traversed by many mountains, chiefly active volcanoes liable to formidable eruptions; one in 1826 caused great loss of life and property. The E. coast is sterile, but most other parts are fertile and well cultivated, owing to the abundance of rivers, the principal of which is the Kusnayara. Cotton cloth, silk goods, and paper are manufactured. Capital, Nagasaki.

**KIWI-KIWI**. See APTERYX.

**KLADNO**, a town of Bohemia, 13 m. N. N. W. of Prague, with which it is connected by railway; pop. in 1870, 11,199. It has a castle and several iron works. In the neighborhood are important coal and iron mines.

**KLAGENFURTH**, a town of Austria, capital of the duchy of Carinthia, 40 m. N. N. W. of Laybach; pop. in 1870, 15,200. It is the seat of the bishop of Gurk, and has a theological faculty, an episcopal seminary, a gymnasium, a *Realschule*, a deaf and dumb institution, a society of natural history, which has founded a national museum, and a historical society. It has manufactories of woollens, silks, and muslins. It is supposed to occupy nearly the site of the Roman Tiburnia, but it first became a place of interest and importance early in the 16th century, when it was fortified by the emperor Maximilian I. Görgey, after his surrender, was for many years confined at Klagenfurth.

**KLAMATH**, a N. W. county of California, bordering on the Pacific, bounded N. by Klamath river, which also intersects it, and traversed by Trinity river; area, about 2,000 sq. m.; pop. in 1870, 1,686, of whom 542 were Chinese. The surface is mostly mountainous, and in some places is covered with dense forests of redwood, cedar, spruce, and fir. The valleys are fertile, and the hilly districts afford good pasturage. Gold mining is prosecuted to a large extent near Klamath, Trinity, and Salmon rivers, at Gold Bluff, and in the vicinity of the beach. The Klamath Indian reserve,

25,000 acres in extent, is situated partly in this and partly in Del Norte co. The chief productions in 1870 were 2,360 bushels of wheat, 2,375 of oats, 9,548 of potatoes, and 693 tons of hay. There were 284 horses, 368 mules and asses, 372 milch cows, 1,587 other cattle, and 1,057 sheep; 2 saw mills, and 2 quartz mills. Capital, Orleans Bar.

**KLAMATH**, a river of California. It rises in Lower Klamath lake in the S. part of Oregon, and flows W. and S. across the California frontier. Its course thence is W. S. W., and afterward S. W., until it is joined by Trinity river on its left bank, when it makes a sharp bend and flows N. N. W. to the Pacific, about lat. 41° 30' N. There is a bar at its mouth which can be crossed at high water by ships of the line, and at low water by small boats only. The river itself is navigable by small steamers for about 40 m. Its waters abound in salmon and other fish, and there are valuable gold diggings on its banks. Its length is about 250 m. The town of Klamath is situated on its right bank, a few miles above its mouth.

**KLAMATHS**, the comprehensive name given to two or three distinct tribes on the Klamath river, living partly in Oregon and partly in California. They seem to have had no recognized tribal name. Those toward the mouth of the river and on the coast were called Euroc or Pohlik, meaning down; those on the upper river were termed Cahroc or Pehtsik. The Quoratem, considered by some as Eurocs, lay in the middle, from Bluff to Clear creek. Above the Cahrocs were the Moadocs or Modocs ("head of the river"), not usually included under the term Klamath. These tribes differed in language and type. The Cahrocs are said to be the finest California Indians, lively, enterprising, and energetic, cleanly in their persons, and great bathers. The Eurocs were darker and inferior. These tribes lived mainly by salmon and other fisheries, and on roots, acorns, &c. The men wear a buckskin girdle, the women a petticoat of the same material. Their houses, 20 ft. square, consisted of a kind of flagged cellar, with a rim around it, beyond which rose the redwood boards forming the sides. A pitched redwood roof covered it. There were no chiefs of the tribes, but only of each village or hamlet. The women tattooed the chin. For money they used the scalp of the red woodpecker or allcochick shells. The influx of whites led to acts of violence, and some of their villages were burned in 1851; but a treaty was made in October of that year. They then had about 18 villages, and numbered about 3,000. An attempt was early made to put them on a reservation, but they declined in numbers. Failure of the crops which they attempted to raise disheartened them. By a treaty of Oct. 15, 1864, the Klamaths and Modocs ceded all the lands from the Cascade mountains, reserving a small tract on Klamath lake, to which they were to remove after the ratification of the treaty, the United States to

pay \$80,000 in 15 years, as well as a large sum for advances, subsistence, &c. This reservation embraces 1,200 sq. m., much of it mountainous, and only a small part fit for cultivation. The Klamaths did not like the introduction of the Modocs into what had been their territory, and this eventually led to the Modoc war. The Klamaths have adapted themselves to their new position, cultivate some ground, have many horses and some cattle, but have become lumberers, turning out in 1873 200,000 ft. of sawed logs. Their district was assigned to the Methodist Episcopal church, but down to 1874 there was no school, church, or missionary. The tribe is fast vanishing, the population being returned in 1873 as only 572, a loss of more than three fourths in 25 years.

**KLAPKA, György**, a Hungarian soldier, born in Temesvár, April 7, 1820. He was educated in the school of artillery in Vienna, entered the noble life guards of the emperor, and in 1847 was appointed officer in a border regiment. In 1848 he offered his services to the new government of his country, and at the beginning of 1849 he was placed at the head of the army of the north. He gained decisive advantages over the Austrians under Schlick in the engagements of Tarczal (Jan. 22), Keresztur-on-the-Bodrog (23), and Tokaj (31), and commanded the right wing of the Hungarian army at Kápolna (Feb. 26, 27). He was promoted to the rank of general, and subsequently took part, under Görgey, in the five principal battles of the April campaign (at Bieske, Izsaszeg, Waitzen, Nagy-Sarló, and Acs), all of which ended in the defeat of the Austrians. His sortie out of the fortress of Comorn, Aug. 3, was one of the most signal deeds of the revolutionary war, and almost annihilated the Austrian army of observation. When the news from the Theiss suddenly destroyed all hope of further advantages, he retired to Comorn and surrendered on Oct. 4. Leaving Hungary, he lived for some time in Hamburg, London, Paris, and Switzerland. On the outbreak of the war against Russia he went to Constantinople, but failed to obtain an appointment. He became a citizen of Geneva in 1855. During the wars of 1859 and 1866 he entered into communication with the enemies of Austria, organizing Hungarian legions against her, and after the battle of Sadowa even entered Hungary; but the attempts failed. After the reconstruction in 1867, he returned to Hungary, and took part in the reorganization of the military forces of the country. In 1873 he was employed by the Porte in reorganizing the Turkish army, and in January, 1874, he accompanied Duke William of Württemberg in a journey to Egypt. He is the author of "Memoirs of the War of Independence in Hungary" (Leipsic, 1850; English translation, 2 vols., London, 1850); a history of "The National War in Hungary and Transylvania" (2 vols., Leipsic, 1851); and of "The War in the East" (Geneva, 1855; English ed., London, 1855).



**KLAPROTH.** I. **Martin Heinrich**, a German chemist, born at Wernigerode, Dec. 1, 1743, died in Berlin, Jan. 1, 1817. After being engaged for some years in Berlin as a practical chemist, he became an apothecary in 1780, and in 1787 was appointed professor of chemistry in the school of artillery. He was among the first who labored industriously in the classification of minerals by means of scientific analysis. He is the discoverer of zirconium, titanium, uranium, and tellurium. He first proved that potassium was found in volcanic products and in white garnets, and made known molybdate of lead and sulphate of strontium. II. **Heinrich Julius von**, a German traveller and orientalist, son of the preceding, born in Berlin, Oct. 11, 1783, died in Paris in August, 1835. Until the age of 15 he applied himself to chemistry and natural science, and from that time to oriental languages. After two years spent at the university of Halle, he went in 1802 to Dresden, where he devoted eight months to the oriental MSS. of its library. Here he began the publication of the *Asiatisches Magazin*. The Russian government sent him in 1805 with an embassy to Peking; but being recalled before crossing the frontier, he remained six months at Irkutsk and studied several Asiatic tongues. From this place he explored alone, in 1806, a wide range of the northern Chinese frontier. He returned to St. Petersburg in 1807, and was sent on a mission to the then almost unknown mountain regions of the Caucasus. The results of his researches were so little favorable to the hope that Russia could readily acquire dominion over the country, that it was with the greatest difficulty that Klaproth obtained in 1810 permission to publish an account of his expedition. The annoyances which he experienced on this occasion determined him to quit Russia, and two years later (1812) he obtained leave to depart. In 1814 he visited Italy, and finally went with the allied army to Paris, where he passed the remainder of his life. He remained for a long time the chief authority on various branches of Asiatic geography and philology; but of late the itineraries of his travels in central Asia have been subjected to most serious accusations, and Sir H. C. Rawlinson, in a "Monograph on the Oxus" read before the royal geographical society of London in 1872, declares the exposure of imposture in regard to three incriminated memoirs to have been fully established by Lord Strangford. His publications are: *Reise in den Kaukasus*, &c. (2 vols., Berlin, 1812-'14); *Supplément au Dictionnaire chinois-latin du Père Basile de Glemona* (Paris, 1819); *Asia Polyglotta ou classification des peuples de l'Asie*, &c. (1823-'9); *Tableaux historiques de l'Asie*, &c. (1824-'6); *Mémoires relatifs à l'Asie* (3 vols., 1824-'8); *Tableau historique, &c., du Caucase* (1827); *Vocabulaire latin, persan et coréen* (1828); *Examen critique des travaux de M. Champollion jeune* (1832). He left in MS. an extensive work, *Nouveau*

*Mithridate, ou Classification systématique de toutes les langues connues*, which contains a grammatical sketch of most known languages, with a polyglot vocabulary of the five grand divisions of the world. An English translation by F. Shoberl of his "Travels in the Caucasus and Georgia, performed in 1807-'8," appeared in London in 1814.

**KLAUSENBURG** (Hun. *Kolosvár*), a town of Transylvania, capital of the county of the same name, and before 1848 of the whole country, on the Szamos, near its source, 225 m. E. by S. of Pesth, with which it is connected by railway; pop. in 1870, 26,382, chiefly Magyars. It has a fortified but partly decayed castle, and consists of two towns, the old and new, and six suburbs. It has Roman Catholic, Greek Catholic, and Protestant churches, a Roman Catholic gymnasium and seminary, a Protestant gymnasium, a Unitarian college, a Greek Catholic school, a Franciscan convent, two museums, a Hungarian theatre, and several benevolent institutions. Among the prominent buildings are several palaces belonging to the Transylvanian nobility. Klausenburg contains the only Unitarian college on the continent of Europe. In October, 1872, a university was opened here, the second in the lands of the Hungarian crown. It is an important centre of the trade between Transylvania and the neighboring counties of Hungary. It has also manufactories of porcelain. It was a colony of the Romans, belonging to the province of Dacia, and ancient coins and relics are frequently found in the vicinity. Matthias Corvinus was born here, and it has often figured in Hungarian history. During the Hungarian revolution it was taken by Gen. Bem, Dec. 25, 1848.

**KLAUSTHAL.** See CLAUSTHAL.

**KLÉBER, Jean Baptiste**, a French soldier, born in Strasburg in 1753 or 1754, assassinated in Cairo, Egypt, June 14, 1800. His father, a mason, died when he was a child, and he was educated by a country clergyman, his relative, who sent him to Paris to study architecture; but at the end of two years he returned to his native city. Two Bavarian gentlemen, whom he had protected from insult at a café, took him to Germany and placed him in the military school at Munich. After serving a few years as sub-lieutenant in the Austrian army, he resigned in 1783, returned to Alsace, and obtained the office of inspector of public buildings in the town of Belfort. In 1792 he enlisted as a private, soon became adjutant, distinguished himself during the siege of Metz, and was raised to the rank of adjutant general. He was put under arrest on the surrender of that city, and taken to Paris, where he fully vindicated his conduct and that of the whole garrison. He was then made a brigadier general, sent to La Vendée with the first division of the "army of Metz," fought heroically against the royalists, defeated them at Chollet, Oct. 17, 1793, and in concert with Marceau gained a victory at Savenay, Dec. 22. The in-

dignation he then manifested at the cruelties ordered by the commissioners of the convention caused him to be cashiered; but he was recalled in 1794, raised to the rank of general of division, and sent to the army of the north under Jourdan. He shared in the victory at Fleurus, June 26, 1794, and in the conquest of the Austrian Netherlands. In 1795 he blockaded Mentz, and directed several bold operations on the banks of the Rhine. In the following campaign he defeated the Austrian division under the prince of Würtemberg at the crossing of the Sieg, June 1, 1796, and nearly destroyed the same, three days later, at the battle of Altenkirchen. Nevertheless, he was dismissed, and retired to Chaillot, in the vicinity of Paris, where he devoted his leisure to preparing his *Mémoires*. In 1798 he joined Bonaparte in his expedition to Egypt, and received a wound on the head at the storming of Alexandria, where he remained in the capacity of governor. He accompanied the expedition to Syria, led the advance division, crossed the desert, took Gaza and Jaffa, won the victory of Mount Tabor, and on the raising of the siege of Acre covered the retreat of the exhausted army. When Bonaparte returned to France, he confided to Kléber the command of the army. The latter, who had never believed that Egypt could be held, listened to proposals of peace, and signed the treaty of El-Arish with Sir Sidney Smith, by which the French were allowed to leave Egypt with their arms and baggage. Kléber hastened to deliver some of the fortresses he held to the Turks, but was informed by Lord Keith that the treaty had not been ratified by the English government, and that the French army must lay down their arms and give themselves up as prisoners of war. On the reception of this news, Kléber attacked the Turkish army, won the brilliant victory of Heliopolis (March 20, 1800), retook Cairo and several other cities, and found himself again the undisputed master of Egypt. He now succeeded in conciliating Murad Bey, and was about to conclude peace with the Turks when he was murdered while walking in his garden at Cairo, by a young fanatic named Solyman. Kléber's remains were brought to Marseilles on the evacuation of Egypt by the French army, and placed in the château d'If. In 1818 they were removed to his native city, and a bronze statue was inaugurated over them, June 14, 1840.

**KLEIST, Ewald Christian von**, a German poet, born at Zehlin, Pomerania, March 3, 1715, died in Frankfurt-on-the-Oder, Aug. 24, 1759. After studying at Königsberg, he entered successively the Danish and the Prussian military service, was appointed lieutenant under Prince Henry by Frederick the Great, and after distinguishing himself for valor was fatally wounded in the battle of Kunersdorf. His greatest production is *Der Frühling* (1749). An edition of his complete works was published at Berlin in 1803 (2 vols.; 2d ed., 1825). A new edition, revised by Julian Schmidt, appeared in 1859.

**KLEIST, Heinrich von**, a German poet, born in Frankfurt-on-the-Oder, Oct. 10, 1776, died near Potsdam, Nov. 21, 1811. He made the campaign of the Rhine against France, and afterward studied law. After the battle of Jena he lamented in his poems the misfortunes of his country and his own imprisonment during the French occupation of Berlin. During the Austrian war against France in 1809, he hastened full of hope toward Vienna, but heard of the conclusion of peace on his way. Two years later he committed suicide in company with a friend, the wife of a Berlin merchant. He was one of the most able of the German romantic school of poets, and Gervinus calls him "the political Werther of his age."

**KLEMM, Friedrich Gustav**, a German historian, born in Chemnitz, Saxony, Nov. 12, 1802, died in Dresden, Aug. 26, 1869. He graduated at Jena in 1825, became in 1834 assistant, and in 1852 chief librarian at Dresden, and resigned in 1863. He pursued his historical studies with particular regard to the progress of civilization and humanity. His ethnographical, historical, and antiquarian collection was taken to Leipsic in 1871, for the central anthropological museum of that city. His principal works are: *Die Geschichte von Baiern* (3 vols., Dresden, 1828); *Allgemeine Culturgeschichte der Menschheit* (10 vols., Leipsic, 1843-'52); *Allgemeine Culturwissenschaft* (2 vols., 1854-'5); *Die Frauen* (6 vols., Dresden, 1854-'8); and *Vor fünfzig Jahren* (2 vols., Stuttgart, 1865).

**KLENGEL, Johann Christian**, a German painter, born near Dresden, May 5, 1751, died Dec. 19, 1824. The son of a peasant, he was learning bookbinding when he was provided with means to study at the academy of Dresden, and afterward in Italy. In 1802 he became professor in the Dresden academy, and was at the head of a school of landscape painters. He excelled in pictures of harvests, and many of his landscapes are remarkable for fine coloring, though mostly ultra-realistic imitations of nature. Many of his works found purchasers in Russia, and he made engravings from a great number of his paintings.

**KLENKE**. See KARSCH.

**KLENZE, Leo von**, a German architect, born in Hildesheim, Feb. 29, 1784, died in Munich, Jan. 27, 1864. He studied in Paris and Italy, became the friend and adviser of the crown prince of Bavaria, and after the elevation of the latter to the throne as Louis I. in 1825, was the architect of the Walhalla, as well as of the Glyptothek, Pinakothek, and other public buildings in Munich. He published a number of essays on art, including a treatise in which he endeavored to prove that the Grecian style of architecture is alone adapted to churches.

**KLIEFOTH, Theodor Friedrich Dethlef**, a German theologian, born at Körchow, Mecklenburg, Jan. 18, 1810. He has been for the last 25 years the principal ecclesiastical dignitary at Schwerin, and is a leader of the Old Lutherans. His principal works are: *Die ursprüngliche*



*Gottesdienstordnung in der deutschen Kirche lutherischen Bekenntnisses* (Rostock, 1847); *Liturgische Abhandlungen* (4 vols., 1854-'8); *Das Buch Ezechiel* (2 vols., Wismar, 1864-'5); and *Das Buch Daniel* (Schwerin, 1868).

**KLIKITAT**, a S. county of Washington territory, separated from Oregon by the Columbia river; area, 3,000 sq. m.; pop. in 1870, 329. The W. part is occupied by the Cascade range, and in the extreme N. W. is Mount Adams, 9,570 ft. high. In the S. E. is Kliki-tat prairie, watered by the Pattaha, a branch of the Yakima. In the W. part are the Kliki-tat, Womumchee, and White Salmon rivers. The best portion of the county is occupied by the reservation of the Yakima Indians, and it also contains the Simcoe agency. The chief productions in 1870 were 1,818 bushels of wheat, 2,635 of oats, 3,263 of barley, 1,373 of potatoes, and 455 tons of hay. There were 390 horses, 879 milch cows, 2,480 other cattle, and 753 swine. Capital, Rockland.

**KLIKITATS**, a roving tribe of Indians, north of the Columbia river and east of the Cascade mountains, composed of five bands, and numbering between 2,000 and 3,000. They are great gamblers for *hyaqua*, or shell money, and are restless and troublesome. They joined the Yakimas, with whom they are closely united, in the war of 1855, killed the agent Bolen, and took part in the surprise of Step-toe, but were defeated by Wright. They were soon after placed on White Salmon reservation, and are now on the Yakima reservation near Fort Simcoe, Washington territory, and are regarded as part of the Yakima nation.

**KLIN**, a town of European Russia, on the Sestra, in the government and 46 m. N. W. of Moscow; pop. in 1867, 6,580. It has an imperial palace, and was formerly the hereditary seat of the Romanoff family.

**KLINGER**, Friedrich Maximilian von, a German poet, born in Frankfort, Feb. 19, 1753, died in St. Petersburg, Feb. 25, 1831. He was educated at Giessen, began to write for the stage at Weimar and Leipsic, was sub-lieutenant in the volunteer corps of Walter in the war of the Bavarian succession, and went from Weimar to St. Petersburg in 1780, where under Catharine II. he became colonel, under Paul major general and director of the corps of cadets, and under Alexander in 1811 lieutenant general. He was in active service nearly 40 years. He was the most conspicuous representative of that excited period of German literature called the "storm and pressure period," which in fact took its name from his drama *Sturm und Drang* (1775). An edition of his select works was published at Stuttgart (12 vols., 1842).

**KLIJSPRINGER** (Dutch, cliff springer), a South African field antelope, *oreotragus saltatrix* (Bodd.). The male is about 3½ ft. long and 22 in. high at the shoulder; the head is short and broad, with a tapering nose and large bald muffle; the horns, which exist only in the males, are about 5 in. long, slender, vertical,

nearly parallel, acute, with a few rings at the base; the tear bag is arched and transverse; the ears are pointed, nearly as high as the horns; the eyes are full, lively, and dark hazel; the hoofs are small, square, and compressed, with large and blunt false hoofs; the tail very short. The body and limbs are robust; the hair is thick, wavy, erect, and quill-like, forming a natural pad to protect the body from bruises and falls in their dangerous retreats; the mammae are two. The color of the hair is grayish, brown at the end, with a short yellow tip, giving the general hue as a brown grizzled with yellow; the lower parts are whitish, and the edge of the ears and feet above the hoofs black; the color varies in intensity according to season. The females resemble the males, except in the absence of horns. These animals live in pairs. They possess the climbing propensities and sure-footedness of the goats, living among rocks inaccessible to



Klipspringer (*Oreotragus saltatrix*).

man and dogs, and springing like the chamois from one precipice to another with great agility and rarely failing accuracy. They used to be abundant in the colony of the Cape of Good Hope, but have been so hunted that they are now driven to the mountainous regions of the interior; their venison is considered the best in the country, and their elastic hair is in great demand for stuffing saddles.

**KLOPP**, Onno, a German historian, born in Leer, East Friesland, Oct. 9, 1822. He studied at Bonn, Berlin, and Göttingen, and from 1845 to 1858 was a teacher at the gymnasium of Osnabrück. He was employed in 1866 by King George of Hanover in various missions, and followed him into exile. His works include *Geschichte Ostfrieslands* (3 vols., Hanover, 1854-'8), *König Friedrich II. von Preussen und die deutsche Nation* (Schaffhausen, 1860), and *Tilly im Dreissigjährigen Kriege* (2 vols., Stuttgart, 1861). He edited, under

the auspices of the king, the works of Leibnitz relating to history and politics (5 vols., Hanover, 1864-'6), which is to be continued, though interrupted by the overthrow of the king of Hanover.

**KLOPSTOCK, Friedrich Gottlieb**, a German poet, born in Quedlinburg, July 2, 1724, died in Hamburg, March 14, 1803. He was born in a small house at the foot of the castle hill in the Schlossplatz, recognizable by the two pillars which support its porch. His father was a public functionary in comfortable circumstances and his mother a woman of great piety. In 1740 he entered the seminary of Schulpforte. At that early age he was already possessed by the ambition of producing a great epic. The stirring incidents of the life of Henry the Fowler captivated for a time his imagination, as shown by some odes written by him in honor of that prince; but after his attendance at the university of Jena (1745), religious enthusiasm led to the conception of his *Messias* ("Messiah"). In 1746 he went to Leipsic, then the resort of many literary men, who, after their secession from the pedantic school of Gottsched, had formed in 1740 a poetical union and established an independent literary journal published in Bremen. Klopstock, in his ode entitled *Wingolf*, distinguishes Gellert, Rabener, Hagedorn, Gleim, and many others of his literary associates of Leipsic, who as early as 1747 had recognized him as able to inaugurate a new era in German poetry. The first three cantos of his "Messiah" were published in 1748, in the Bremen *Literarische Zeitung*, and the poem was eventually regarded as equal to the epics of Dante and Milton, especially by the religious and female portion of the community. Gottsched, however, ridiculed what he called Klopstock's "seraphic spirit of fanaticism;" and his strictures on his dogmatism, his effeminate and morbid tenderness, and his religious sentimentality were afterward confirmed by Lessing, although in a milder and more dignified spirit. Foremost among his admirers was Bodmer of Zürich, the opponent of Gottsched, the translator of Milton, and the head of a school of poets and religionists. From 1748 to 1750 Klopstock was employed as a teacher in the family of his relative Weiss in Langensalza, where he met the sister of his friend Schmidt, whom he celebrates in his odes as his beloved Fanny, but who did not reciprocate his affection. In the summer of 1750 he went with his friend Sulzer to Zürich, which he left in the following year, in compliance with an invitation from the Danish prime minister Bernstorff, who offered him a pension of \$300, in order to enable him to devote himself exclusively to the completion of his epic. On his way to Copenhagen he fell in love with Margaretha (Meta) Moller, the daughter of a Hamburg merchant, whom he celebrates under the name of Cidli. In the Danish capital he was received with marked distinction, and introduced to the king, whom he accompanied on

a journey to Holstein, on which occasion he spent some time with Meta, who became his wife in 1754. She died in 1758, in her 31st year. The loveliness of her character is apparent in her correspondence with Richardson, the English novelist, with Cramer, an intimate friend of Klopstock, and with her husband. (See "Memoirs of Frederick and Margaret Klopstock," English translation, by Elizabeth Smith, London, 1808; and her correspondence with Richardson, 1818.) Klopstock resided now alternately in Brunswick, Quedlinburg, and Blankenburg, till 1763, when he returned to Copenhagen. In 1771, on Bernstorff's withdrawal from the ministry, he went to Hamburg with the rank of a councillor of the Danish legation. In 1792 he contracted a second marriage with Johanna Elisabeth von Dimpfel, whose first husband had been a nobleman named Windhem. He lived in Hamburg until his death, occasionally visiting literary friends in various parts of Germany. A pension was conferred upon him by the prince of Baden, and honorary citizenship by the French revolutionists. His death was looked upon in Germany as a national calamity, and his funeral was celebrated with the pomp and solemnity generally accorded only to royal personages.—The last two volumes of his "Messiah" and the greater portion of his odes appeared from 1769 to 1773. He wrote various grammatical and philological works and sacred dramas, or rather dramatic poems, chiefly turning upon characters of the Old Testament, as "The Death of Adam," "Solomon," and "David;" also several patriotic dramas (*Bardiete*), in commemoration of the national hero Hermann. Novalis (Hardenberg) says Klopstock's works resemble translations from some unknown poet, prepared by a skilful but unpoetical philologist. Goethe remarked in his conversations with Eckermann that German literature was greatly indebted to Klopstock, who was in advance of his times, but that the times had since advanced beyond Klopstock. Goethe in his autobiography also records his personal impression of Klopstock: "He was of small stature, but well built. His manners were grave and decorous, but free from pedantry. His address was intelligent and pleasing. On the whole, one might have taken him for a diplomatist. He carried himself with the self-conscious dignity of a person who has a great moral mission to fulfil. He conversed with facility on various subjects, but rather avoided speaking of poetry and literary matters." His works have gone through many editions. Among the English translations of the "Messiah" is one into prose by Mrs. and Mr. Collyer, and a metrical translation appeared in London in 1825-'6. The "Death of Adam" and "Solomon" have also been translated into English, as well as his "Odes," the latter by W. Nind (London, 1848).—See also Miss Benger, "Klopstock and his Friends" (London, 1814); Mörikofer, *Klopstock in Zürich* (Zürich, 1851); and a French essay on

him by Dietz (Paris, 1859). D. F. Strauss has an essay on Klopstock in his *Kleine Schriften* (Berlin, 1866).

**KNABL, Joseph**, a Tyrolese sculptor, born at Fliess in 1821. He is the son of a farmer, and studied first under a local artist, and subsequently in Munich, where he became in 1863 professor in the academy. He excels in mediæval statuary. His principal works represent religious subjects, as his "St. Anne and Mary," for the Eichstädt cathedral, which obtained a prize in 1858 and his admission to the academy, and his masterpiece, the "Coronation of Mary," for the high altar of the church of Our Lady in Munich.

**KNAPP, Albert**, a German poet, born in Tübingen, July 25, 1798, died in Stuttgart, June 18, 1864. After becoming pastor at Stuttgart, he applied himself to poetry, especially to the composition of hymns, and published a small volume of them annually between 1833 and 1853, under the title of *Christoterpe*. Among his other publications are three collections of poems (Stuttgart, 1829, 1834, and 1843), and *Evangelischer Liederschatz für Kirche und Haus* (1837; 3d ed., 1865), taken from the liturgies and hymns of every Christian century.

**KNAPP, Georg Christian**, a German theologian, born in Halle, Sept. 17, 1753, died there, Oct. 14, 1825. He was educated in the orphan school at Halle, founded by Francke, of which his father was director, and in the universities of Halle and Göttingen. In 1777 he became extraordinary, and in 1782 ordinary professor of theology at Halle, maintaining a system of rational supernaturalism, seeking to harmonize revelation with the theoretical and the practical reason. His *Vorlesungen über die Christliche Glaubenslehre* has been translated into English, with additions, by Leonard Woods, jr., D. D.

**KNAPP, Jacob**, an American clergyman, born in Otsego co., N. Y., Dec. 7, 1799, died in Rockford, Ill., March 2, 1874. He entered the theological institution at Hamilton, N. Y., in 1821, and began active work as pastor of the Baptist church in Springfield, N. Y., where he also managed a farm. From thence he moved to Watertown, N. Y., where also he was at the same time pastor of a church and manager of a large farm, displaying a full degree of energy and capacity in each occupation. In 1832 he experienced deeper religious impressions, which he himself was accustomed to call his second conversion; and from that time he gave up his secular employment, and undertook a wider work as an evangelist. He applied to the New York state Baptist convention for appointment as their missionary; but as they hesitated to appoint him, he began preaching as an evangelist on his own responsibility. He preached at first in school houses and obscure churches, but was soon sought by the largest churches and most distinguished pastors. In Baltimore, Boston, and New York vast num-

bers attended his preaching, and such excitement prevailed that mobs threatened him and his hearers, and the protection of the civil authorities was necessary. His preaching was stern and terrible, yet cultivated and able men were moved by it, as well as the populace. Thousands believed themselves converted under his ministry. A few years before his death he visited California. In his old age he had acquired, by several judicious business investments, a comfortable competency, which he proposed shortly before his death to distribute among the benevolent societies of his church.

**KNAPP, Ludwig Friedrich**, a German chemist, born at Michelstadt, Hesse-Darmstadt, Feb. 22, 1814. He studied under Liebig, graduated at Giessen as a chemist, and at the mint in Paris as an assayer. He was professor at Giessen from 1841 till the close of 1853, and subsequently in the economical institution of Munich. In 1856 he became inspector of the royal porcelain works, and in 1863 he went to Brunswick to teach chemistry at the polytechnic school. He has published *Lehrbuch der chemischen Technologie* (2 vols., Brunswick, 1847; translated into English by Ronalds and Richardson, 3 vols., London, 1848-'51, and by W. R. Johnson, 2 vols., Philadelphia, 1848-'9), and translated Percy's "Metallurgy" (1862). He has made some remarkable investigations relative to tanning.

**KNAPP, Samuel Lorenzo**, an American author, born in Newburyport, Mass., in 1784, died in Hopkinton, Mass., July 8, 1838. He graduated at Dartmouth college in 1804, studied law, and was admitted to the bar of Massachusetts. He made his first appearance as an author in "Travels of Ali Bey" (18mo, Boston, 1818), a work purporting to give an eastern traveller's experiences of society in Boston and Cambridge. It was followed in 1821 by "Biographical Sketches of Eminent Lawyers and Statesmen and Men of Letters." In 1828, having previously been connected as editor or contributor with several literary journals, he established himself in New York in the practice of his profession. Among his remaining works are: "Lectures on American Literature" (New York, 1829); "Sketches of Public Characters" (1830); "American Biography" (1833); "Life of Aaron Burr" (1835); "The Bachelor and other Tales" (1836); and "Female Biography of different Ages and Nations." He was the author of a variety of occasional public addresses.

**KNAUS, Ludwig**, a German painter, born at Wiesbaden, Oct. 5, 1829. He studied in Düsseldorf, and became famous in 1850 by his admirable genre pictures of humble life. He resided in Paris from 1853 to 1861, in Berlin from 1861 to 1866, and in Düsseldorf from 1866 to 1874, when he was appointed minister of art at Berlin. Besides many portraits, his works include "The Gamblers," "Peasants' Dance," "The Funeral," "A Fair, with a Chief hunted by the Police," "The Gypsies," "The

Golden Wedding," "After Baptism," "The Juggler in the Barn," and more recently "The Coffee Hour" and "Mud Pies." Engravings of his works are especially popular among the German peasantry.

**KNEBEL, Karl Ludwig von**, a German author, born at Wallerstein, Bavaria, Nov. 30, 1744, died in Jena, Feb. 23, 1834. His family were Protestant refugees from the Netherlands. He became an officer in the regiment of the Prussian crown prince, and was subsequently connected with the court at Weimar, and with Goethe, whose confidence he enjoyed. He made excellent translations, especially of Alfieri's "Saul," and wrote poetry. Varnhagen von Ense and Mundt edited his literary remains and correspondence (3 vols., Leipsic, 1835), the latter furnishing a biographical notice, and Guhrauer published Knebel's *Briefwechsel mit Goethe* (2 vols., 1851).

**KNEELAND, Samuel**, an American naturalist, born in Boston, Aug. 1, 1821. He graduated at Harvard college in 1840, and at the medical school of the same institution in 1843, and studied in Paris till 1845. Subsequently he practised medicine in Boston, taught anatomy in the Harvard school, was connected for two years with the Boston dispensary, was for five years secretary of the Boston natural history society, and for two years of the American academy of arts and sciences. He also explored Brazil, the copper region of Lake Superior, and the Hawaiian islands. From 1862 to 1866 he was surgeon in the army, first under Gen. Burnside, but for most of the time serving in New Orleans and Mobile. In August, 1866, he was appointed secretary of the Massachusetts institute of technology, and professor of zoology and physiology in that institution, which posts he still holds (1875). In the summer of 1874 he visited Iceland, at the time of its millennial celebration, for the purpose of studying the volcanic phenomena of that island. He edited the "Annual of Scientific Discovery" from 1866 to 1869, wrote most of the zoological and many medical articles in the "New American Cyclopædia" and the "American Cyclopædia," and has contributed largely to scientific periodicals. Besides a translation of Andry's "Diseases of the Heart" and an edition of Smith's "History of the Human Species," he has published "The Wonders of the Yosemite Valley and of California" (Boston, 1871).

**KNELLER, Sir Godfrey**, an English portrait painter, born in Lübeck, Germany, in 1648, died in London in October, 1723. He was instructed in painting by Rembrandt and Ferdinand Bol in Amsterdam, and afterward in Rome by Carlo Maratti and Bernini, and gained some reputation in Italy, particularly in Venice, for historical compositions. He arrived in London in 1674, and, having obtained an introduction to the king through the duke of Monmouth, was permitted to paint the royal likeness. The manner in which this was executed procured him abundant employment. Upon the death

of Sir Peter Lely he was appointed court painter to Charles II., an honor confirmed by each successive sovereign during the life of the artist. He was knighted by William III., and painted the beauties of his court (which are considered much inferior to Sir Peter Lely's beauties of the court of Charles II.), and was made a baronet by George I. He painted no fewer than ten sovereigns, and an immense number of lesser celebrities. So numerous were his commissions that he was frequently only able to finish the faces of his portraits, leaving the draperies and accessories to be painted by others. He was a covetous man, and acquired considerable wealth. His portraits possess greater value as likenesses of historical personages than as works of art. He is said to have left at his death 500 unfinished portraits on which he had received half the price in advance.

**KNIAZNIN, Franciszek Dyonizy**, a Polish poet, born in Vitebsk, Oct. 4, 1750, died at Kon-skawola, near Pulawy, Aug. 25, 1807. He studied at the Jesuits' college in Vitebsk, entered that order, and after its suppression repaired to Warsaw, where he eventually became secretary to Prince Adam Czartoryski. An unfortunate passion for the eldest daughter of his patron, and the tragic events which brought about the fall of his country, plunged him into melancholy, passing into derangement. His works, of which there are various collections, comprise songs, idyls, fables, several larger poems, and translations.

**KNIEBIS MOUNTAINS**, a principal range of the N. or Lower Black Forest, traversing the borders of Württemberg and Baden, opposite Alsace. They are regarded as a bulwark against France, have been the scene of engagements during the thirty years' and other wars, and contain the watering places of Freiersbach, Petersthal, Griesbach, Antogast, and Rippoldsau, all belonging to the grand duchy of Baden. These have annually about 4,000 visitors. A railway was projected in 1874 across these mountains.

**KNIGHT, Charles**, an English publisher and author, born at Windsor, March 15, 1791, died at Addlestone, Surrey, March 9, 1873. His father was a bookseller at Windsor, and he succeeded to the business. His first publication, which he edited in conjunction with Mr. E. H. Locker, was "The Plain Englishman," a periodical (3 vols., 1820-'22). At Windsor, in 1823, he commenced "Knight's Quarterly Magazine," and continued it in 1824 in London, whither he then removed. This work, in 8 vols. 8vo. contains the earliest literary productions of Macaulay, Praed, Moultrie, and others. In 1827-'8 he published a continuation of the "London Magazine," in which a few years earlier had appeared Carlyle's "Life of Schiller" and De Quincey's "Confessions of an English Opium-Eater." Soon afterward he became connected with the society for the diffusion of useful knowledge, as their publisher and agent, and immediately undertook a series of valuable works, under the sanction of the

society, but generally at his own risk and expense. Foremost were the "Penny Magazine," in three series (1832-'45), which at one time had a circulation of nearly 200,000 copies weekly; the "British Almanac" and "Companion to the Almanac," begun in 1828 and still continued; the "Penny Cyclopædia" (30 vols. small fol., 1833-'56), since condensed as the "National Cyclopædia;" the "Library of Entertaining Knowledge," to which he contributed a volume on "The Elephant" (1831); the "Pictorial History of England," by Craik and Macfarlane, with its continuation entitled "History of the Thirty Years' Peace," by Mr. Knight and Miss Martineau (1840-'50); and the "Gallery of Portraits of Distinguished Men." Several of the above works were edited by Mr. Knight, and all enjoyed much of his supervision. He also edited the "Pictorial Bible" (4 vols. 4to, 1838); the "Pictorial Book of Common Prayer" (1838); the "Store of Knowledge" (1841); "London Pictorially Illustrated" (6 vols., 1841-'4; abridged into the "Cyclopædia of London," 1851); "Old England, a Pictorial Museum of National Antiquities" (2 vols. fol., 1845); the "Weekly Volume," a series extending to 126 vols. (18mo, 1843-'5); "Half Hours with the Best Authors" (4 vols., 1847-'8); "The Land we Live in" (4 vols., 1848); "Cyclopædia of the Industry of All Nations" (1851); "Half Hours of English History" (2 vols., 1853); "Geography of the British Empire" (2 vols., 1853), &c. He won a position as a Shakespearian scholar by his "Pictorial Shakspeare," including a biography and a "History of Opinion, with Doubtful Plays and Index" (8 vols. 8vo, 1839-'41; library edition, 12 vols. 18mo, 1842-'4; national edition, with biography and "Studies," 8 vols. 8vo, 1851-'3); "Plays and Poems, with Glossarial Notes" (7th ed., 1 vol. 8vo, 1857); "Companion Shakspeare" (8 vols. 12mo, 1855-'7), &c. In 1854, having purchased the plates of the "Penny Cyclopædia," Mr. Knight began the "English Cyclopædia," based upon that work, but greatly enlarged and modified (22 vols. 4to, usually bound in 11, with a separate volume of indexes). His own writings more especially are: "Results of Machinery" (1830), and "Rights of Industry, Capital, and Labor" (1831), amalgamated and enlarged under the title of "Knowledge is Power" (1855); "Life of Caxton" (1844), enlarged under the title of "The Old Printer and the Modern Press" (1854); "Varieties" (1844); "New Lamps for Old: Remarks on Mr. Collier's Discovery of the Annotations on Shakspeare" (1851); "Once upon a Time" (1854), a collection of his miscellaneous works; and "The Struggles of a Book against Excessive Taxation," and "The Case of the Authors as regards the Paper Duty," pamphlets which largely contributed to the repeal of the English duty upon paper, as proposed in Mr. Gladstone's budget of 1860. In 1856 appeared the first volume of "The Popular History of England,

an Illustrated History of Society and Government from the Earliest Period to our own Times." This work, the most important of Mr. Knight's writings, was completed in 1862 in 8 vols. 8vo, bringing the British annals down to the final extinction of the corn laws in 1849. The new editions of this work contain an appendix, giving a chronological account of public events, legislation, and statistics until the time of publication. He also wrote an autobiography, "Passages of a Working Life during Half a Century" (3 vols., 1863-'5; abridged American ed., 1 vol., New York, 1874); "School History of England" (1865); "Begg'd at Court" (1867); "Questions on School History" (1868); and "Half Hours with the best Letter Writers" (2 vols., 1866-'8). Mr. Knight's whole life was one of useful and intellectual labor, and it is not too much to say that he was the founder of that description of literature, cheap yet good, which has exercised a very beneficial influence on the minds of his countrymen during the last 50 years. His success as a man of business was not equal to his enterprise. About the year 1860 he received the appointment, through the influence of Lord Brougham, of publisher of the "London Gazette," almost a sinecure, at £1,200 a year. His statue was erected at Windsor in 1874.

**KNIGHT. I. Richard Payne**, an English author, born at Wormsley Grange, Herefordshire, in 1750, died in London, April 24, 1824. Being a sickly child, he was not put to school, nor allowed to study either Latin or Greek at home. In 1764, however, upon the death of his father, he was sent to a grammar school, and in the course of a few years obtained a thorough knowledge of Latin and Greek. In 1771 he came into possession of a large property, and from 1780 to 1806 held a seat in parliament, during the last 22 years as member for the borough of Ludlow, in which he owned a large estate. In 1814 he was appointed a trustee of the British museum, to which institution his unique collection of antiquities, consisting chiefly of ancient bronzes and Greek coins, and valued at £50,000, was bequeathed. His admiration of Greek art having directed his attention to those subjects which illustrate it, he published in 1786 "An Account of the Remains of the Worship of Priapus lately existing at Isernia, in the Kingdom of Naples, to which is added a Discourse on the Worship of Priapus, and its connection with the Mystic Theology of the Ancients" (4to). This work was privately printed, and was attacked on the score of its indelicacy, notwithstanding the author's object was simply to elucidate an obscure point in Greek mythology. In 1791 appeared his "Analytical Essay on the Greek Alphabet" (4to), in which he broached some opinions of questionable value on the use of the digamma, and also exposed the forgery of certain inscriptions claimed to have been found by Fourmont in Laconia, and which had deceived Winckelmann, Heyne, and some of the



best scholars of the age. He next attempted poetry, and published in 1794 a didactic poem entitled "Landscape," followed by "The Progress of Civil Society" (4to, 1796), "A Monody on the Death of the Right Honorable C. J. Fox" (1806-'7), and "Alfred, a Romance in Rhyme" (1823). In 1805 appeared his "Analytical Inquiry into the Principles of Taste," a work characterized by refinement and acuteness of thought, and which proved the most popular of all his publications. His edition of the Iliad and Odyssey, with prolegomena, in which he attempted to restore the digamma, and to relieve the text of the interpolations of later rhapsodists and poets, is now considered of little authority. The prefaces and descriptions of "Specimens of Ancient Sculpture selected from different Collections of Great Britain by the Society of Dilettanti" (fol., 1809-'35) were also written by him. **II. Thomas Andrew**, brother of the preceding, a vegetable physiologist, born Oct. 10, 1758, died in London, May 11, 1838. He graduated at Balliol college, Oxford, and subsequently devoted much time to experiments in vegetable and animal physiology. Some suggestions as to the means of propagating fruit trees, communicated to the royal society in 1795, brought him into great repute. In 1797 he published "A Treatise on the Culture of the Apple and Pear, and on the Manufacture of Cider and Perry," in which the same subject is further developed; and in 1811, "Pomona Herefordensis, or Natural History of the Old Cider and Perry Fruits of the County of Hereford." After his death appeared a collection of his physiological and horticultural papers (8vo, London, 1841).

#### KNIGHTHOOD. See CHIVALRY.

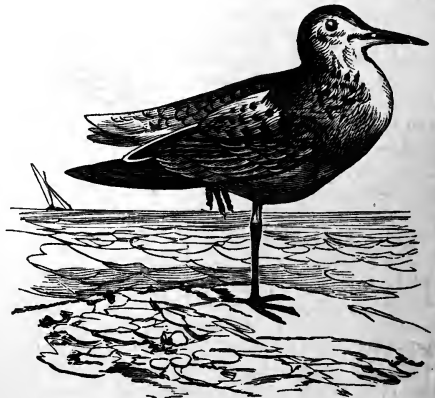
**KNIPPERDOLLING, Bernhard**, a German Anabaptist, born in Münster near the end of the 15th century, executed Jan. 23, 1536. Exiled for several years from his native town, he adopted in Sweden the doctrines of the Anabaptists. On his return to Münster, he united with Rothmann, John Matthias or Matthiesen, John Boccold of Leyden, and others, and being wealthy was able by the favors which he granted to unite the poorer inhabitants against the rich. He was imprisoned, but released by his partisans, and succeeded in banishing the nobility, clergy, and many of the most influential citizens from the city. A council was chosen in 1534, in which the Anabaptists were predominant, and they immediately filled all public offices with their adherents, made Knipperdolling first burgomaster, and proclaimed an equality of estates, polygamy, and community of goods. All who refused to cooperate with them were driven from the city or slain. Knipperdolling was subsequently proclaimed stadtholder, and John of Leyden king, it being prophesied that the latter should be victorious over all the princes and principedoms of the earth. On the capture of the city by a Catholic army in 1535, Knipperdolling was taken

prisoner, and put to death with fearful torture, which he endured with extreme inflexibility. (See ANABAPTISTS, and JOHN OF LEYDEN.)

**KNOBELSDORFF, Hans Georg Wenzeslaus von**, baron, a German architect, born near Krossen, Brandenburg, Feb. 17, 1697, died in Berlin, Sept. 16, 1753. He gave up a colonelcy in 1730 to study painting and architecture, became chief director of royal buildings in Berlin, and designed the Thiergarten, the opera house, and the new wings of the palaces at Charlottenburg and Dessau. His masterpiece is the palace of Sans Souci at Potsdam.

**KNOBLECHER, Ignaz**, a German traveller, born in Carniola, July 6, 1819, died at Gondokoro, Africa, April 13, 1858. He was educated at the Propaganda in Rome with a view to devoting himself to the African mission, and after having been ordained went to Syria, where he passed a year in the study of Arabic. Thence he removed to Khartoom on the Nile, and in 1849 was ordered to ascend that river and establish a mission among some negro tribes near the equator. Accompanied by another priest, Angelo Vinco, he set out, Nov. 13, with the trading party which annually goes up the Nile, and on Jan. 14, 1850, reached the rapids in lat. 4° 49' N., the furthest point till then reached by any expedition. Knoblercher, however, succeeded in stemming the rapids, and on the 16th reached the village of Logwek, in lat. 4° 10'. He examined the Bahr el-Ghazal or Gazelle river, and returning to Germany published an account of his explorations. He afterward fixed his residence at Khartoom, having received the appointment of vicar general apostolic of central Africa.

**KNOT**, the European name of a sandpiper of the genus *tringa* (Linn.), one of the few birds



Knot.

common to the old and new worlds; other names are the ash-colored, red-breasted, gray-backed, and robin snipe; it is the *T. canutus* (Linn.). The length is about 10 in., the extent of wings 20, the bill  $1\frac{1}{2}$ , and the weight 6 oz.; it is the largest of the genus in the United

States. The color of the summer plumage is light gray above, with black and pale reddish spots; rump and upper tail coverts white, with narrow bands and crescents of black; below light brownish red, with under tail coverts, thighs, sides, and under wing coverts white, spotted and barred with brownish black; quills brownish black, with white shafts; tail brownish cinereous, each feather white-edged. In winter the upper parts are darker, with brownish black edgings; below dull ashy white, lightest on abdomen, with numerous longitudinal dark brown lines and spots on the breast and neck. The knot is found throughout eastern North America and Europe. It is a very active bird, nimbly running and wading along the edge of the waves on sandy beaches, searching for minute shell fish and marine worms; the flight is swift, and large flocks perform very beautiful and rapid aerial evolutions. The flesh of the young and fat birds is considered a delicacy.

**KNOUT** (properly **KNUT**), the Russian word for whip, and the name of an instrument of punishment formerly in use in Russia. The culprit was bound to two stakes, and received on his bare back the specified number of lashes from a whip of plaited thongs interwoven with wire; 100 to 120 lashes were considered equivalent to a sentence of death. The whipping was inflicted by the hands of a convict respited from Siberia and kept in prison for that purpose. If a culprit survived this punishment, he was banished for life to Siberia. In earlier times the nose was slit, the ears were cut off, and the letter V, for *vor* (rogue), was branded on the forehead; but this aggravation was abolished by Alexander I. The nobility were legally exempt from the knout, but the privilege was not always respected. The punishment was inflicted on the worst class of criminals, but now and then also on political offenders. The knout was abolished by the emperor Nicholas, who substituted the *pleti*, a kind of lash.

**KNOWLES, James Davis**, an American clergyman, born in Providence, R. I., in July, 1798, died in Newton, Mass., May 9, 1838. His father, a respectable mechanic of Providence, apprenticed him at the age of 12 to a printer. He studied French and Latin without a teacher, and on becoming co-editor in 1819 with Prof. Goddard of the "Rhode Island American," he studied Greek, and at a later period made respectable progress in Hebrew. At the age of 22 he joined the Baptist church, and entered the sophomore class of Columbian college, Washington, D. C. He graduated in 1824, and was immediately appointed tutor, but in December, 1825, was ordained pastor of a church in Boston. In 1832 he was called to the chair of pastoral duties and sacred rhetoric in the Newton theological institution. In 1836 he founded the "Christian Review," a quarterly journal of the Baptist denomination. Visiting New York in the latter part of April, 1838, to

attend the anniversaries of his denomination, he took the smallpox, of which he died. His principal works are a "Memoir of Mrs. Ann H. Judson" (1827), which went through numerous editions, and a "Memoir of Roger Williams, Founder of Rhode Island" (1834).

**KNOWLES, James Sheridan**, a British dramatist, born in Cork, Ireland, in 1784, died at Torquay, England, Nov. 30, 1862. He was the son of James Knowles, a teacher of elocution, and author of a "Pronouncing English Dictionary." In 1792 the family removed to London, and four years later young Knowles produced his first play, a juvenile performance in which he and a number of young amateurs took part. At the age of 22 he made his debut as an actor in the Crow street theatre, Dublin. For about ten years he led an unsettled life, sometimes as an actor, sometimes as a teacher of elocution, and with but moderate success in either occupation. He wrote nothing for the stage worthy of mention till 1815, when his "Caius Gracchus" was produced in Belfast with great success. His next play, "Virginius," in which Macready sustained the leading part at Drury Lane, first made him generally known to the dramatic public; and thenceforth for many years he was one of the leading playwrights in England. His "Beggars of Bethnal Green," "Hunchback," and "Wife" followed; and in the two latter, which are still popular on the stage, the author appeared in leading characters. After engagements in various parts of the United Kingdom he made a successful tour in the United States. On his return to England he produced "The Love Chase," "Woman's Wit," "The Maid of Mariendortp," "Love," "Old Maids," "John of Procida," "The Rose of Aragon," and "The Secretary," all of which enjoyed a fair degree of success, while some are still standard acting plays. His health began to fail after this, and in 1849 a pension of £200 was procured for him, it being represented that the profits of his dramatic writings had never equalled this sum per annum. In 1845 he abandoned the stage, and subsequently became known as an eloquent preacher of the Baptist denomination. Two polemical works, "The Rock of Rome" and "The Idol Demolished by its own Priest," testify to the energy with which he employed his pen in this new calling. He also wrote two novels, "George Lovel" and "Henry Fortescue." A collective edition of his plays was published in 1841-'3 (3 vols., London). He published a collection of his minor writings under the title of "The Elocutionist" (19th ed., 1853). His last years were spent in total retirement on account of sickness.

**KNOX**, the name of nine counties in the United States. **I.** A S. county of Maine, bordering on the Atlantic, bounded E. by Penobscot bay, and intersected by the Medomac and St. George's rivers; area, 330 sq. m.; pop. in 1870, 30,823. It has a productive soil, and

contains a number of small lakes. A portion of the inhabitants are engaged in navigation and fishing. The Knox and Lincoln railroad terminates at the county seat. The chief productions in 1870 were 3,721 bushels of wheat, 15,445 of Indian corn, 12,276 of oats, 25,259 of barley, 190,676 of potatoes, 45,859 lbs. of wool, 395,960 of butter, and 28,014 tons of hay. There were 1,785 horses, 4,608 milch cows, 1,653 working oxen, 3,790 other cattle, 10,600 sheep, and 1,291 swine; 9 manufactories of carriages, 18 of cooperage, 9 of cured and packed fish, 1 of gunpowder, 5 of iron, 39 of lime, 9 of marble and stone work, 9 of saddlery and harness, 6 of sails, 2 of woollen goods, 13 ship-building and repairing establishments, 4 tanneries, 3 currying establishments, 2 flour mills, and 9 saw mills. Capital, Rockland. **II.** A N. W. county of Texas, near the head of the Brazos river, by which and the Big Wichita it is drained; area, 1,275 sq. m. There were no inhabitants enumerated in 1870. Most of the surface is hilly and broken, but in the S. part there is an undulating mezquite prairie. Gypsum is so abundant as to render the water of most of the streams unfit for drinking, and the Wichita and Brazos are contaminated by deposits of salt near their sources. Timber is not abundant; the principal varieties are mezquite and cedar. The soil is a red loam suitable for pasturage and grain. **III.** An E. county of Tennessee, watered by Clinch, Holston, and French Broad rivers; area, 575 sq. m.; pop. in 1870, 28,990, of whom 4,840 were colored. The surface is mountainous, being crossed by Copper ridge, Chestnut ridge, and Bay's mountain. Iron ore, limestone, and marble are abundant, and the soil of the lowlands is fertile. It is traversed by the East Tennessee, Virginia, and Georgia, the Knoxville and Charleston, and the Knoxville and Kentucky railroads. The chief productions in 1870 were 151,232 bushels of wheat, 548,546 of Indian corn, 259,047 of oats, 25,702 of Irish and 24,243 of sweet potatoes, 26,532 lbs. of tobacco, 26,328 of wool, 222,078 of butter, and 5,766 tons of hay. There were 4,907 horses, 4,543 milch cows, 6,795 other cattle, 13,441 sheep, and 22,519 swine; 2 manufactories of saddlery and harness, 1 of sash, doors, and blinds, 1 of machinery, 1 of printing paper, 6 of iron, 2 tanneries, 1 flour mill, and 4 saw mills. Capital, Knoxville. **IV.** A S. E. county of Kentucky, traversed by Cumberland river; area, 600 sq. m.; pop. in 1870, 8,294, of whom 557 were colored. It has a mountainous surface, and abounds in iron ore, coal, and limestone. The chief productions in 1870 were 13,670 bushels of wheat, 214,369 of Indian corn, 36,670 of oats, 11,290 of potatoes, 14,348 lbs. of wool, 78,427 of butter, and 992 tons of hay. There were 1,212 horses, 1,534 milch cows, 3,399 other cattle, 8,372 sheep, and 12,761 swine. Capital, Barbourville. **V.** A central county of Ohio, drained by Vernon and Wadhonding rivers and the N. fork of Licking

river; area, 525 sq. m.; pop. in 1870, 26,338. The surface is undulating, and the soil, particularly in the W. part, is remarkably fertile. The Lake Erie division of the Baltimore and Ohio, and the Cleveland, Mount Vernon, and Delaware railroads pass through it. The chief productions in 1870 were 836,176 bushels of wheat, 20,389 of rye, 1,223,270 of Indian corn, 440,130 of oats, 97,301 of potatoes, 24,887 lbs. of tobacco, 676,603 of wool, 57,988 of maple sugar, 799,366 of butter, and 40,770 tons of hay. There were 9,429 horses, 8,542 milch cows, 12,141 other cattle, 145,613 sheep, and 27,872 swine; 24 manufactories of carriages, 4 of iron castings, 2 of engines and boilers, 1 of linseed oil, 4 of sash, doors, and blinds, 7 of tin, copper, and sheet-iron ware, 3 of woollen goods, 6 tanneries, 2 currying establishments, 13 saw mills, and 8 flour mills. Capital, Mount Vernon. **VI.** A S. W. county of Indiana, bordering on Illinois, bounded W. by the Wabash river, S. by White river, and E. by the W. fork of the White; area, 513 sq. m.; pop. in 1870, 21,562. It has a level surface, occupied in the W. part by prairies, and contains beds of coal. The soil is very fertile. The Evansville and Crawfordsville, the Ohio and Mississippi, and the Indianapolis and Vincennes railroads pass through it. The chief productions in 1870 were 376,950 bushels of wheat, 959,209 of Indian corn, 55,767 of oats, 46,235 of potatoes, 56,237 lbs. of wool, 137,185 of butter, and 7,331 tons of hay. There were 6,415 horses, 4,632 milch cows, 7,571 other cattle, 18,907 sheep, and 33,110 swine; 4 manufactories of carriages, 5 of cooperage, 1 of machinery, 4 of saddlery and harness, 4 of tin, copper, and sheet-iron ware, 3 breweries, 8 saw mills, and 6 flour mills. Capital, Vincennes. **VII.** A N. W. county of Illinois, drained by Spoon river; area, 729 sq. m.; pop. in 1870, 39,522. It has an undulating surface, diversified with prairies and woodlands, a fertile soil, well watered by creeks, and extensive beds of coal. The Chicago, Burlington, and Quincy railroad and the Peoria branch pass through it. The chief productions in 1870 were 275,418 bushels of wheat, 113,547 of rye, 2,708,319 of Indian corn, 787,952 of oats, 12,723 of barley, 147,909 of potatoes, 53,885 lbs. of wool, 668,074 of butter, and 53,014 tons of hay. There were 18,247 horses, 10,997 milch cows, 23,738 other cattle, 16,137 sheep, and 61,768 swine; 8 manufactories of agricultural implements, 9 of brick, 3 of brooms and wisp brushes, 35 of carriages, 1 of cars, 1 of dressed furs, 2 of iron castings, 4 of machinery, 1 of marble and stone work, 10 of masonry, 2 of pumps, 16 of saddlery and harness, 14 of tin, copper, and sheet-iron ware, 1 of woollen goods, 2 wool-carding and cloth-dressing establishments, 5 planing mills, 6 saw mills, and 16 flour mills. Capital, Galesburg. **VIII.** A N. E. county of Missouri, drained by the North, South, and Middle Fabius, and the N. fork of Salt river; area, 512 sq. m.; pop. in 1870, 10,-



974, of whom 200 were colored. It has a nearly level surface, diversified with woods and prairies, and a fertile soil. The Quincy, Missouri, and Pacific railroad passes through it. The chief productions in 1870 were 63,745 bushels of wheat, 573,003 of Indian corn, 257,812 of oats, 10,600 lbs. of tobacco, 62,890 of wool, and 19,065 tons of hay. There were 7,215 horses, 5,417 milch cows, 14,968 other cattle, 24,758 sheep, and 30,765 swine; 10 manufactories of carriages, 10 of brick, 8 of saddlery and harness, 5 of tin, copper, and sheet-iron ware, 1 of woollen goods, 4 saw mills, and 3 flour mills. Capital, Edina. **IX.** A. N. E. county of Nebraska (formerly called L'Eau Qui Court), separated from Dakota by the Missouri and Niobrara rivers; area, about 1,000 sq. m.; pop. in 1870, 261. The chief productions were 1,309 bushels of wheat, 3,610 of Indian corn, 3,210 of potatoes, and 1,012 tons of hay; value of live stock, \$20,610. Capital, Niobrara.

**KNOX, Henry**, an American general, born in Boston, July 25, 1750, died in Thomaston, Me., Oct. 25, 1806. He was of Scotch and Irish Presbyterian stock, and his father came from St. Eustatius, one of the Dutch West India islands. He received the common school education of his time in Boston, where he became a thriving bookseller, his shop being a favorite resort of cultivated persons. He was an officer in Major Dawes's corps of grenadiers, and by practice and study became an adept in military science. He married Miss Lucy Fluker, a daughter of the provincial secretary. Shortly before the battle of Bunker Hill he managed to escape the guards of Gen. Gage with his wife, and to make his way to Cambridge with his sword carefully concealed in the folds of her dress. He was actively engaged in that battle as a volunteer aid to Gen. Ward, reconnoitring the movements between the heights and the headquarters; and upon his reports Ward issued his orders. He soon attracted Washington's attention by his skill as an engineer in planning and constructing fortifications, and as an artilleryman. Attached to the regiment of artillery which had been formed under the veteran Gridley, he was soon raised to its command. He was sent in quest of cannon and ordnance stores, and succeeded in bringing to camp early in 1776 a long train of sledges bearing more than 50 cannon, mortars, and howitzers, which proved of great service in the siege and bombardment of Boston. He subsequently took the management of all the artillery in New York. He was almost the last officer to leave the city, remaining so late that he escaped capture only by seizing a boat and making his way by water. He distinguished himself in the New Jersey campaign, and on Jan. 2, 1777, his well directed cannonade repulsed Cornwallis in repeated attempts to pass the Assumpink. He shared in the brilliant action at Princeton on the following day. Having been made by congress brigadier general of the artillery, he

was sent to Massachusetts to expedite the raising of a battalion of artillery, and became the organ of communication with the executive council of the state concerning the military events of that year. At the battle of Brandywine the fire of the artillery against Knyphausen at Chad's ford was maintained by Knox with vigor from morning till evening. The failure at Germantown was partly attributed to his tenacious adherence to the military maxim never to leave an enemy's fort in the rear, causing the pursuit to be abandoned at Chew's garrisoned house. After the fall of Fort Mifflin, Nov. 15, 1777, he was sent with De Kalb and St. Clair to provide for the security of Red Bank. He passed the winter at Valley Forge, laboring to improve the discipline and efficiency of the army, and was prominently engaged in the hot battle of Monmouth, June 28, 1778. In the general order after the battle Washington had "the satisfaction to inform Gen. Knox and his officers that the enemy had done them the justice to acknowledge that no artillery could be better served than theirs." Knox accompanied Washington and Lafayette to Hartford to mark out their future plans of cooperation, and returned by way of West Point, where he sat on the court martial for the trial of André. In the ensuing winter he was again sent to New England to gather men and means for the next campaign. During the heaviest part of the cannonade at Yorktown, Knox was in the grand battery by the side of Washington. He was now advanced by congress to the rank of major general, and was commissioned with Gouverneur Morris to arrange the exchange of prisoners and settlement of expenses. He was placed in command at West Point after the announcement of the cessation of hostilities, and on him devolved the delicate task of disbandment. He was appointed to arrange the surrender of New York with Sir Guy Carleton. After the peace he was a candidate with Greene and Lincoln for the secretaryship of war, in which office he succeeded the latter in March, 1785. There was no separate department for the navy, and its duties therefore devolved chiefly on him. He retained his department after the organization of the new government. In December, 1795, following the example of Hamilton, he retired from the cabinet, and removed to St. Georges in Maine for the improvement of an estate, acquired partly in the right of his wife and partly by purchase, upon which he expended large amounts. When in 1798 the army was reorganized at the prospect of war with France, his feelings were deeply wounded by the cabinet's reversal of President Adams's order of appointments, and the precedence assigned to Hamilton in the new military arrangements. His proposal was to serve as aide-de-camp to Washington.—See "Life and Correspondence of Henry Knox," by Francis S. Drake (Boston, 1874).

**KNOX, John**, a Scottish religious reformer, born at Gifford, Haddingtonshire, or at Gifford-

gate, a suburb of Haddington, in 1505, died in Edinburgh, Nov. 24, 1572. After receiving his preliminary education at the grammar school of Haddington, he was sent about 1524 to the university of St. Andrews, was ordained, and prior to 1530 became a teacher of philosophy there. The study of the fathers, especially of Jerome and Augustine, had shaken his religious opinions as early as 1535, but it was not till 1542 that he became an avowed and marked reformer. His reprehension of certain practices of the church caused him to retire from St. Andrews to the south of Scotland, where he was declared a heretic, degraded from his office, and threatened by assassins. In default of more definite occupation, he became tutor to the sons of two noble families, listened to the reformed teachers, and occasionally preached to the inhabitants of the surrounding country. After the death of his friend George Wishart he remained in retirement till, nearly a year after the murder of Cardinal Beaton, he took refuge with many other Protestants (1547) in the castle of St. Andrews, which the regent was vainly attempting to reduce. There for the first time he administered publicly both elements of the eucharist, and became known as a powerful preacher against the papacy. The regent, reinforced by a French squadron, obliged the garrison to surrender. The terms of the capitulation were violated, and Knox with his comrades was transported to France, where he was imprisoned in the galleys for 19 months. He experienced extreme hardships, and on his release (1549) directed his course to England, where he was appointed to preach at Berwick and at Newcastle, and became one of the chaplains of Edward VI. For the boldness of his discourses he was several times called to account, but he was able to vindicate himself. A bishopric was offered to him, but he declined it from scruples as to the divine authority of the episcopal order. On the accession of Queen Mary he fled to Dieppe, and passed thence to Geneva. In November, 1554, he took charge of the chapel of the English emigrants in Frankfurt, but resigned soon after because his congregation was in favor of retaining the liturgy. He returned to Geneva and thence to Scotland, where he labored for the spread of the reformation. Dissatisfied with the slow progress of the movement in his native land, he returned to Geneva in 1556, where he became pastor of a small English congregation. The 30 months of his residence in Geneva, in the society of Calvin, Beza, and other learned men, were among the happiest of his life. While in Scotland he had been cited to appear before an assembly of the clergy to be held at Edinburgh, but his opponents avoided the discussion when they found him ready to meet it, supported by persons of influence. But after his return to Geneva the citation was renewed, and he was condemned to be burned as a heretic, and the sentence was executed on his effigy. Against

this condemnation he published the "Appellation of John Knoxe." He also wrote "A Letter to Queen Mary, Regent of Scotland," and a tract entitled "The First Blast of the Trumpet against the Monstrous Regiment of Women" (1558), a vehement attack on political government by women, at a time when Mary of Guise was regent of Scotland and Mary Tudor queen of England, and the nearest in succession to both thrones were females. Invited by the Scottish Protestants to resume his labors in his native country, he landed at Leith in 1559, and rejoiced that he had come "even in the brunt of the battle." The queen regent, throwing off all disguise, had laid her plans for the forcible overthrow of the reformation. At a convention of the nobility and clergy in Edinburgh all the demands of the Protestants were refused. Several of the reforming preachers were summoned to appear at Stirling for trial, but by the dissimulation of the regent were prevented from attending and then outlawed for their failure. Knox hastened to meet them at Perth, where the Protestant preachers had assembled at the summons of the queen. Soon after his arrival he preached against the idolatry of the mass and the veneration of images. At the conclusion of the service a priest ventured to make preparations for celebrating mass, which roused the people to immediate action. The images in the churches were demolished, the pictures torn from the walls and trampled under foot, the holy recesses invaded, and the "rascal multitude," as Knox calls them, did not stop till they had sacked and laid in ruins the houses of the Dominican and Franciscan friars and the Carthusian monastery. The queen regent advanced upon Perth with a considerable army, but, finding the Protestants well prepared for resistance, proposed terms of accommodation which were accepted. The Protestants, in order to consolidate their strength, formed a religious bond or covenant, and began to be distinguished as the congregation, and their leaders as the lords of the congregation. Iconoclasm was a prominent feature in the Scottish reformation. Events similar to those at Perth followed at Stirling, Lindores, Cupar, St. Andrews, and other places. Knox had preached in the cathedral of St. Andrews against the advice of his friends and the threats of the archbishop, and with such success that the magistrates united with the inhabitants in desolating the churches and monasteries, and in establishing the reformed worship. Meantime civil war raged throughout the kingdom between the regent, assisted by French troops, and the lords of the congregation, who implored the succor of Elizabeth. In political as well as ecclesiastical affairs Knox was a conspicuous adviser, and took up his residence in Edinburgh after an extensive circuit through the southern and eastern counties. After a contest of 12 months, marked by many atrocities, the vigorous assistance rendered by Elizabeth, and the death of

the queen regent while the English troops were investing Edinburgh, led to a truce and to the summons of the parliament to settle differences. Parliament assembled in August, 1560, and the reformed religion was established, and Roman Catholicism interdicted by law in Scotland. Knox retained the office of minister in the metropolis, and soon after the arrival of the young Queen Mary (Aug. 21, 1561) he was summoned to her presence. Six interviews are recorded between him and the queen, and the questions which she raised were discussed by him with a freedom and rigor which once drove her to tears. She caused his arrest on a charge of treason in 1563, but all the councillors except the immediate dependants of the court voted for his acquittal. The vehemence of his public discourses led him into frequent difficulties. In 1562 he disputed publicly for three days with Abbot Quentin Kennedy at Maybole; in 1565 he quoted certain texts which gave offence to the queen's consort (Darnley), and was for a short time prohibited from preaching; he fled from Edinburgh when Mary returned from Dunbar after the death of Rizzio; and he preached a sermon at the coronation of the infant James VI. at Stirling, July 29, 1567. Under the brief regency of Moray the work of Knox seemed to be completed, and he thought of retiring to Geneva to end his days in peace. After the assassination of Moray, civil and religious confusion returned under the regency successively of Lennox and Mar. Weakened by a stroke of apoplexy in 1570, Knox yet reappeared in the pulpit, while Kirkaldy of Grange and others of his friends were forsaking the cause of the reformation, and while he differed from his brethren in the assembly about praying for the queen. So violent was the enmity excited by his animadversions, that, following the advice of his friends, he left Edinburgh for St. Andrews, May 5, 1571. He returned in the following year, and his last energies were put forth in denunciations of the perpetrators of the massacre of St. Bartholomew's.—The doctrines of Knox embraced a Calvinistic creed and a Presbyterian polity. The "Order of Geneva," a liturgy which he shared in preparing for the use of the church at Frankfort, and subsequently employed in his congregation at Geneva, was introduced into Scottish Protestant churches in 1565. He introduced the Puritan element into those churches. The office of bishop he declined, disapproving what he regarded as unscriptural ceremonials. Chiefly through his influence the adoration of the sacrament was abolished in the Book of Common Prayer, which, by desire of the government, he aided in preparing under Edward VI. His character was marked by a stern realism, which could be beguiled by no social pretensions, no conventional dignities, no pompous traditions. From this sprang his scornful bitterness and his insensibility to the social graces and refinements which Mary exhibited person-

ally, and sought to transplant from Paris to her native land. His preaching was distinguished for a headlong and vehement energy, which, as the English ambassador said, "put more life into him than 600 trumpets." Earnest and intense in every practical direction, his mind was not at all of a reflective or speculative cast, and as a thinker, save perhaps on political subjects, he takes no rank; his political views rather sprang from an instinctive sense than from the development of fundamental principles. The best known of his writings is the "Historie of the Reformation of Religion within the Realm of Scotland" (1584; mutilated ed. by David Buchanan, London and Edinburgh, 1644; complete ed., Edinburgh, 1732; after the most trustworthy manuscript, with other writings of Knox, by MacGavin, Glasgow, 1831). The collected edition of his works edited by David Laing is probably the most correct (6 vols., Edinburgh, 1846-56). The principal biography of Knox is that by Thomas McCrie (1812; 6th ed., 1839). His biography in the 10th volume of Brandes's *Leben und ausgewählte Schriften der Väter und Begründer der reformirten Kirche* (Elberfeld, 1862) is a valuable study.

**KNOX, Vicesimus**, an English clergyman, born at Newington Green, Middlesex, Dec. 8, 1752, died in Tunbridge, Kent, Sept. 6, 1821. He was educated at St. John's college, Oxford. In 1778 he was elected master of Tunbridge school, and continued there for 33 years, and then settled in London. He is best known as the editor of the compilation entitled "Elegant Extracts." His "Christian Philosophy" has passed through numerous editions. His works, with a biographical preface, were published in London in 1824 (7 vols. 8vo), including "Essays, Moral and Literary."

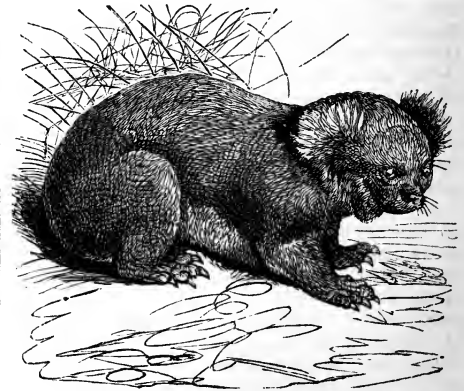
**KNOXVILLE**, a city and the county seat of Knox co., Tennessee, situated at the head of steamboat navigation on the right or N. bank of the Holston river, 4 m. below the mouth of the French Broad, and 165 m. E. of Nashville; pop. in 1870, 8,682, of whom 2,609 were colored; in 1874, including suburbs, about 12,000. It is built on a healthy and elevated site, commanding a beautiful view of the river and surrounding country, and is the point of intersection of the East Tennessee, Virginia, and Georgia railroad with the Knoxville and Ohio and Knoxville and Charleston lines. It is the principal commercial place of East Tennessee, and has a large wholesale trade in dry goods, hardware, boots and shoes, drugs, groceries, &c., with that part of the state and with the neighboring portions of the adjoining states. The chief manufactures are of iron, embracing nails, bar iron, car wheels, &c. There are also sash and blind factories, flouring and saw mills, and four banks with an aggregate capital of \$270,000. It is the seat of East Tennessee university, with which is connected the state agricultural college, and which in 1873 had 14 professors and instructors, 325 students (125 collegiate), and a library of 1,200

volumes, and of the state institution for the deaf and dumb. It has recently been selected as the site of the Knoxville university (Methodist), and of the freedmen's normal school to be established by the Presbyterians. There are several public and private schools, two daily and four weekly newspapers, a monthly periodical, and 20 churches.—Knoxville was settled in 1789, and received its name two years later in honor of Gen. Henry Knox. From 1794 to 1817 it was the territorial and state capital. For a brief period during the civil war Knoxville was a point of considerable strategical importance. It had been held by the confederates, who abandoned it early in September, 1863, upon the approach of the Union force under Gen. Burnside. Soon after the federal reverse at Chickamauga, Sept. 19, 20, Longstreet was sent to operate against Burnside, who was strongly entrenched at Knoxville. Longstreet made a vigorous and partially successful assault, Nov. 18, and as Burnside had provisions for only three weeks, the confederates hoped to reduce him by famine. But Bragg was signally defeated at Chattanooga, Nov. 24, 25, and a strong federal force under Sherman moved toward Knoxville. Longstreet thereupon ventured (Nov. 29) upon an assault on Fort Sanders, the key to the federal position. It was repulsed, the confederates losing about 500 men, the federals less than 50; and the siege was virtually raised, although Longstreet did not finally retire till Dec. 5.

**KNYPHAUSEN, Baron**, a German soldier, born in Alsace about 1725, died in Berlin in June, 1789. His father commanded a regiment under the duke of Marlborough, and his own military career commenced in the service of Frederick William I. of Prussia. Subsequently he served in the several wars waged by Frederick the Great against Austria. In 1776 he received from the British government the command of 12,000 Waldeckers and Hessians hired to aid in repressing the insurrection in the American colonies, and arrived in New York in time to participate in the battle of Long Island in August. He was present at White Plains, and aided in the capture of Fort Washington in November, and in the defeat of the American forces at Brandywine in 1777. In June, 1780, being then in temporary command of the British troops in New York, during the absence of Sir Henry Clinton, he made a descent into the Jerseys with 5,000 men, in the hope of rallying the disaffected Americans to the royal standard; but he accomplished little beyond sacking the village of Connecticut Farms. On the 23d he reentered the Jerseys with reinforcements, and after an indecisive conflict with Gen. Greene, and burning the village of Springfield, he returned to Staten Island.

**KOALA**, or **Kangaroo Bear**, a marsupial animal of the phalanger family and genus *phascolarctos* (De Blainville), the *P. cinereus* (Fisch.). The dental formula is: incisors  $\frac{2}{2}$ , canines  $\frac{1}{1}$ , premolars  $\frac{1}{1}$ , molars  $\frac{4}{4}$ =30; the posterior

upper incisors and canines are small, and the crowns of the molars have four tubercles. The body is stout; the head moderate, with a very short facial portion and naked muffle; ears moderate and clothed with long hairs; eyes large and not protected by lashes; moustaches small and scanty. The toes of the fore feet are in two sets, one composed of the two inner (which are the shortest), and the other of the three outer, of which the central is the longest, and all have long, curved, and compressed claws; the two portions of the feet are slightly opposable; the first toe of the hind feet is very far back, large, and without a nail. The stomach is provided with a cardiac glandular apparatus, and the cæcum is three times as long as the animal; the pouch is well developed; the tail is wanting. The koala is about 2 ft. long, 10 or 11 in. high, with a girth of 18 in.; the limbs are powerful, and the large hands and feet admirably adapted for climbing trees; the fur is dense, soft, and woolly, of a



Koala (*Phascolarctos cinereus*).

general ashy gray color, inclining to brown; hinder part of back dirty yellowish white, under parts dirty white, and inside of hind limbs rusty brown. It inhabits New South Wales, where the natives hunt it for the flesh, pursuing it into the tops of the highest gum trees, in which it passes the day feeding on the tender shoots or sleeping; it descends the trees at night in search of roots, which it digs up with its powerful claws. On the ground it creeps slowly, and when climbing looks like a small bear; when angry it assumes a fierce look and utters a shrill cry. Koalas are found in pairs, and the mother carries her young one on her back when it has outgrown her pouch; they are very tenacious of life. The skull is remarkable for its oblong quadrate form, great width of nasal bones, length of zygomatic arches, auditory protuberances, and depth of rami of lower jaw.

**KOBELL, Franz von**, a German mineralogist, born in Munich, July 19, 1803. He is professor of mineralogy at Munich, and has popularized

that science by a series of publications which have passed through many editions, including a complete history of mineralogy from 1650 to 1860, to form part of the *Geschichte der Wissenschaften in Deutschland* (1864), an elaborate work which was undertaken under the auspices of the late king Maximilian of Bavaria. He has also published several volumes of dialect poems, which have acquired great popularity.—Several of his ancestors and relatives in Germany and Holland were distinguished artists.

**KOCH, Karl Heinrich Emanuel**, a German traveller, born in Weimar in 1809. He studied the natural sciences and medicine at Würzburg and Jena, and undertook in 1836 a scientific journey through the southern provinces of Russia and the Caucasus, of which he published a narrative (2 vols., Stuttgart, 1842-'3). In a second journey in 1843-'4 he extended his researches through Turkey and Armenia to the Caspian sea, obtaining the materials for a new work, *Wanderungen im Orient* (3 vols., Weimar, 1846-'7). On the outbreak of the eastern war, vol. iii. of the latter work was published separately under the title of *Die Krim und Odessa* (Leipzig, 1854; translated by Korner, London, 1855). He has also published *Hortus Dendrologicus* (Berlin, 1853-'4), *Gärtnerkunst und Pflanzenphysiognomie* (1859), and *Der botanische Garten* (1860).

**KOCHANOWSKI, Jan**, a Polish poet, born in the palatinate of Sandomir in 1532, died in Lublin in 1584. He studied in Germany, France, and Italy, and after his return to Poland was employed by King Sigismund Augustus in various missions. His lyrical productions in both Polish and Latin gained him the appellation of the Polish Pindar. Among his writings are a translation of the Psalms in Polish verse, various satires, and a drama. The editions of his works are numerous.

**KOCK. I. Charles Paul de**, a French novelist and dramatist, born at Passy, near Paris, May 21, 1794, died in Paris, Aug. 29, 1871. The son of a Dutch banker, who had removed to France, and who died on the scaffold during the revolution, he was carelessly educated under his mother's supervision, and entered a banking house in the capacity of a clerk. In 1812 he printed at his own risk his first novel, *L'Enfant de ma femme*, which was unsuccessful. He then produced a number of melodramas, vaudevilles, and comic operas, which brought him into notice. In the mean time he published several lively but not very decent tales and novels, which increased his popularity until he became the great favorite of a large class of readers, both in France and abroad, his publications being rapidly translated. His dramatic works number over 100. Many of his novels and vaudevilles were written in part by others, and several bear his name without being his work. Prominent among his literary assistants were Boyer, Varin, Labie, and his own son. See his *Mémoires inédits* (Paris, 1873). **II. Henri de**, a novelist and dramatist, son of the prece-

ding, born in Paris in 1821. He writes with the same fecundity and in nearly the same style as his father. His works now number about 100, and many of them were written with the assistance of Barrière, Fournier, and Gonzalès, and of his father.

**KOEKKOEK, Bernard Cornelis**, a Dutch landscape painter, born in Middelburg, Oct. 11, 1803, died in Cleves, April 5, 1862. He was the son of the celebrated marine painter Johannes Herman Koekkoek. At the great exposition in Paris in 1855 he received a medal of the first class. For many years previous to his death he resided in Cleves, where he established a school of design.—His brothers MARIANUS, ADRIAN, and HERMAN also enjoy a high reputation as painters.

**KOENIG, Heinrich Joseph**, a German novelist, born in Fulda, March 19, 1790, died in Wiesbaden, Sept. 23, 1869. He was connected with the civil service and the diet of Hesse-Cassel till 1850. In 1860 he removed from Hanau to Wiesbaden. His principal historical novels are *Die hohe Braut* (Leipzig, 1833), *Die Clubbisten im Mainz* (1847), *Die Waldenser* (2d ed., 1857, under the title *Hedwig die Waldenserin*), and *William Shakspeare* (3d ed., 1850-'59). His works were published in 20 vols., 1854-'69.

**KOH-I-NOOR.** See DIAMOND, vol. vi., p. 75.

**KOHL, Johann Georg**, a German traveller and author, born in Bremen, April 28, 1808. He was educated at Göttingen, Heidelberg, and Munich, and after serving five years as a private tutor in Courland, a visit to St. Petersburg and the interior of Russia afforded materials for publications which were so favorably received that he decided to devote his life to travel. He visited England, Holland, Denmark, France, Austria, Hungary, and other parts of Europe; was in the United States and Canada in 1854-'8; and published volumes of travel respecting every country he visited. He also wrote some scientific treatises, as *Der Verkehr der Menschen in seiner Abhängigkeit zu der Erdoberfläche* (1841), *Der Rhein* (1851), *Die Donau* (1853), *Skizzen aus Natur- und Völkerleben* (1851), and a series of essays entitled *Aus meinen Hütten* (1852). Several of his works have been translated into English, among which are "Kitchi-Gami: Wanderings round Lake Superior" (London, 1857), "Travels in Canada and through the States of New York and Pennsylvania" (1861), and "A Popular History of the Discovery of America, from Columbus to Franklin" (1862). In 1857 he contributed to the Smithsonian institution two papers on the maps and charts of America at different periods, and wrote a supplemental volume to Hakluyt's work, giving a descriptive catalogue of all the maps, charts, and surveys relating to America. Some years later he sent to the Maine historical society a paper giving new and important information respecting the early coast lines and the patents of the first proprietors of the Maine settlements. Among his later publications are: *Geschichte*



*der Entdeckung von Amerika* (1861; translated into English, London, 1862); *Die beiden ältesten Karten von Amerika* (1861); *Vom Markt und aus der Zelle* (2 vols., 1868); and *Die geographische Lage der Hauptstädte Europas* (1874).—His sister, **IDA KOHL** (born July 25, 1814, and married in 1846 to Count Hermann von Baudissin), wrote in connection with him the *Englische Skizzen* (1845) and separately *Paris und die Franzosen* (1845).

**KOHLRAUSCH, Heinrich Friedrich Theodor**, a German author, born near Göttingen, Nov. 15, 1780, died in Hanover, Jan. 31, 1867. He was from 1830 a teacher in Hanover. His most popular books were *Die deutsche Geschichte* (Elberfeld, 1816; 15th ed., Hanover, 1866; abridged, 10th ed., Gütersloh, 1867; translated into English, 1847), and *Chronologischer Abriss der Weltgeschichte* (15th ed., Leipsic, 1861). In 1863 appeared his autobiography (*Erinnerungen aus meinem Leben*).

**KOKOMO**, a town and the county seat of Howard co., Indiana, situated on Wild Cat creek, an affluent of the Wabash, and at the intersection of the Indianapolis, Peru, and Chicago with the Pittsburgh, Cincinnati, and St. Louis railroad, 50 m. N. of Indianapolis; pop. in 1870, 2,177. It contains a number of manufactories, a national bank, and three weekly newspapers. It is the seat of Howard college, organized in 1869, which in 1872 had 5 professors and instructors, and 69 students.

**KOLA**, a town of Russia, capital of the circle of Kem, in the government and about 360 m. N. W. of the city of Archangel, in the N. W. part of the peninsula of Kola, and at the confluence of the rivers Kola and Tuloma, 36 m. from the Arctic ocean; lat. 68° 50' N., lon. 33° 15' E.; pop. in 1867, 1,062, including Lapps and a few Finns. It is noticeable as the most northern town of European Russia, and the former capital of the old Russian Laplandish territory. It has a good harbor, and contains three churches and a school. It was bombarded by the allies during the eastern war, Aug. 23, 1854.

**KOLAPOOR**, a native state of the Deccan, India, under the political management of the presidency of Bombay, bounded N. and N. E. by Sattara, E. and S. by Belgaum, and W. by Sawunt Warree and Rutnagherry; area, 3,500 sq. m.; pop. about 500,000. It is traversed by the Ghaut mountains, and by the Kistnah and other rivers. The soil is exceedingly fertile, despite the ruggedness of the country. The principal races are the Mahrattas and Ramooses. The rajahs of Kolapoor boast of their descent from the founder of the Mahratta empire; but their authority has become within the last 30 years only nominal, the English being the actual rulers.—**KOLAPOOR**, the capital, 185 m. S. E. of Bombay, long notorious for its unhealthy condition, has been lately improved.

**KOLB, Georg Friedrich**, a German journalist and author, born at Spire, Sept. 14, 1808. He published a journal in Spire in 1830, which he

edited for more than 20 years in the liberal interest, and was a member of the Frankfort parliament in 1848. As member of the Bavarian chamber he prepared a report on the so-called Greek loan, which required the ex-king Louis I. to replace from his private means the entire amount which had been paid to his son King Otho of Greece. To escape from persecutions, he remained in Zürich from 1853 to 1860. Subsequently he edited the *Frankfurter Zeitung*, and in 1863 he resumed his seat in the Bavarian chamber. He opposed the Franco-German war of 1870-'71, and advocated the right of suffrage for the people of Alsace-Lorraine. His principal works are: *Handbuch der vergleichenden Statistik* (1858; 6th ed., 1871); *Grundriss der Statistik* (1862; 4th ed., 1871); and *Culturgeschichte der Menschheit* (2 vols., 1869-'70; 2d ed., 1874).

**KOLBE, Adolf Wilhelm Hermann**, a German chemist, born near Göttingen, Sept. 27, 1818. He studied under Wöhler, and became in 1842 assistant to Bunsen, whom he succeeded in 1851 as professor in the university of Marburg, after having been in the interval employed by Playfair in London, and edited Liebig and Wöhler's *Handwörterbuch der Chemie*. In 1865 he became professor at Leipsic. His principal works are: *Das ausführliche Lehrbuch der organischen Chemie* (vols. i. and ii., Brunswick, 1854 and 1863), *Das chemische Laboratorium der Universität Marburg* (Marburg, 1865), and *Die Entwicklung der Chemie in der neuesten Zeit* (Munich, 1871 et seq.).

**KOLBE, Karl Wilhelm**, a German painter, born in Berlin in 1781, died there, April 8, 1853. He was the nephew of an engraver and author of the same name (1757-1835), and became known in 1806 by his "Albert Achilles victorious in Nuremberg," and subsequently by many other works for Prussian churches and palaces, including "The Princess off for the Falcon Chase," "The Battle of Otho the Great against the Huns," and "A Vintage Festival in the Middle Ages."

**KOLBERG**. See **COLBERG**.

**KÖLCSEY, Ferencz**, a Hungarian author, born in the county of Middle Szolnok, Aug. 8, 1790, died in Pesth, Aug. 24, 1838. He studied at the Protestant college of Debreczin, and, though deprived by an accident of one of his eyes, early distinguished himself. In 1809 he was appointed notary of the royal court at Pesth, and in 1826, with Paul Szemere, started a literary periodical under the title of *Élet és irodalom* ("Life and Literature"). In the diet of Presburg of 1832-'6 he acquired new fame, and when Wesselényi was arraigned for treason by the Austrian government, Kölcsey undertook his defence, but died suddenly soon after. His "Works," embracing songs, ballads, satires, short novels, critical writings, and some of his orations, were collected after his death, to which was added after the outbreak of the revolution of 1848 his "Diary during the Diet of 1832-'6."

**KOLDEWEY, Karl**, a German explorer, born at Bücken, Hanover, Oct. 26, 1837. He qualified himself for maritime life in the Bremen commercial navy, at the polytechnic school of Hanover, and at the university of Göttingen. He commanded in 1868 the first, and in 1869 the second arctic expedition sent out by Dr. Petermann, and published accounts of them in that geographer's *Mittheilungen*. In 1871 he became first assistant in the observatory at Hamburg, and prepared under Dove's direction the meteorological and hydrographical results of the arctic voyage (Berlin, 1871-'2).

**KOLDING**, a town of Jutland, Denmark, on the Koldingfiord (a large bay of the Little Belt), and on the railway from Flensburg to Fridericia, about 10 m. W. S. W. of the latter town; pop. in 1870, 5,400. It contains the fine remains of Koldinghuus, a castle built in the 13th century as a royal residence, and burned in 1808. Here the Schleswig-Holstein troops defeated the Danes, and stormed the town, April 23, 1849. About 7 m. from Kolding is the hill of Samlingsbanke, formerly included in Schleswig, where immense meetings were held prior to 1848 to protest against the separation from Denmark. The obelisk on this spot was pulled down by the Germans in 1864; but it was restored by the Danes, who by the boundary treaty retained possession of the locality.

**KOLIN**, or **Kollin**, a town of Bohemia, on the Elbe, 35 m. E. of Prague, on the railway from Vienna; pop. in 1870, 9,460. It consists of the city proper, which is surrounded by a wall, and four suburbs. It has a Gothic church, an old castle with fine grounds, a convent founded in 1666, a council house, and several factories. An obelisk was erected here in 1842 in honor of a victory gained June 18, 1757, by the Austrians over Frederick the Great. An inn is still in existence which was in the centre of Frederick's position, and from the windows of which he commanded his army.

**KOLLAR, Jan**, a Slavic scholar and poet, born in N. W. Hungary in 1793, died in Vienna, Jan. 29, 1852. He studied at Presburg and Jena, took orders, and in 1819 became preacher to an evangelical congregation at Pesth. In 1849 he was made professor of archæology in the university of Vienna. Being a Slovak by birth, he became a champion of the national regeneration of his race, and the most zealous, if not the first, advocate of Panslavism, or of a union, literary and political, of all Slavic tribes. He developed this tendency in poetical works, written mostly in the Czech language, as well as in disquisitions on the antiquities of the Slavs. Among the former are his *Bázně* ("Poems," 1821), *Slavý dcera* ("The Daughter of Glory"), his most celebrated work, and *Narodnie spievanky* (a collection of Slovak "Popular Songs"); among the latter, *Rozprawy o imenach* ("Treatises on the Names" of the ancient Slavs), *Slava bohyni* ("Goddess Slava"), "On the Literary Relation of the Slavic Tribes and Dialects" (in German), *Cesto-*

*pis* ("A Journey" for antiquarian purposes to northern Italy), and "Ancient Slavic Italy," a work in German, which was published after his death (Vienna, 1853). A complete edition of his *Spisy* ("Writings") was published in Prague (4 vols., 1860-'65).

**KÖLLIKER, Rudolf Albert**, a German physiologist and microscopist, born in Zürich, July 6, 1817. He studied at the gymnasium and university of his native town till 1839, when he went to Rome and soon after to Berlin. In the last named place he began the important microscopic investigations that first gave him his fame as a physiologist. His attention had first been directed to this branch of study while on a visit to the island of Föhr, off the coast of Schleswig, in 1840, and from that time he devoted himself almost exclusively to it. In 1842 he was appointed assistant to Henle at Zürich, and in 1845 adjunct professor of physiology and comparative anatomy. In 1847 he became professor of the same branches at Würzburg, and in 1849 of anatomy there. He has published *Verzeichniss der Phanerogamen des Cantons Zürich* (Zürich, 1839); *Beiträge zur Kenntniss der Geschlechtsverhältnisse und der Samenflüssigkeit wirbelloser Thiere* (Berlin, 1841); *De prima Insectorum Genesi* (Zürich, 1842); *Entwicklung der Cephalopoden* (1844); *Microscopische Anatomie* (2 vols., Leipsic, 1850-'54); *Handbuch der Gewebelehre* (1852; 5th ed., 1867); *Die Entwicklung des Menschen* (1861); and *Icones Histologicæ* (1864). He has been a frequent contributor to scientific periodicals, and was one of the founders of the medico-physical society of Würzburg. He ranks among the greatest histologists; and his works, the chief of which have been translated into English, belong to the highest authorities in anatomical science.

**KOLOMNA**, a town of Russia, in the government and 63 m. S. E. of the city of Moscow, near the confluence of the Moskva with the Oka, and on the great central railway; pop. in 1867, 19,890. It has an old citadel, a flourishing industry, and an important trade in provisions. In 1237 the Russians suffered here a crushing defeat by the Mongolians under Batu Khan.

**KOLOSSES**, a name applied by the Russians to a family of Indian tribes on the N. W. coast of America, extending from lat. 54° 40' to the Atna or Copper river, and comprising the Hydás, Hennegas, Tongas, Stikeens, Kakes, Koas, Kutzns, Awks, Sundowns, Takos, Chilkahs, Hoodsuahoos, Hunnas, and Sitkas. Each tribe is divided into clans, like those in some of the eastern nations, and named the Bear, Eagle, Crow, Whale, and Wolf; and none can intermarry in his own clan. Descent is in the female line. They are a shrewd, bold, perfidious people, evincing considerable ingenuity and skill. They are unprepossessing in appearance, paint their faces, and wear a pin thrust through the lower lip. Their houses are of planks, set upright and roofed with bark,



often 40 ft. wide, 60 deep, and 20 high, with sleeping apartments arranged at the sides. Their canoes are dugouts, 45 ft. long, ornamented with carvings, and there are generally curiously carved posts in front of the houses. Their *baidarkas*, or skin boats, are inferior to those of the Esquimaux. They burn the dead, preserving their ashes in wooden boxes or tombs, curiously decorated. The Koloshes were visited by Behring in 1741, but they captured and destroyed two of his boats with their crews. During the absence of Baranov, the founder of Sitka, from that post in 1800, the Koloshes attacked it and murdered most of the garrison; but Baranov, aided by Krusenstern's fleet, punished them. They continued hostile, and Sitka required a palisade. Their numbers are estimated at about 12,000.

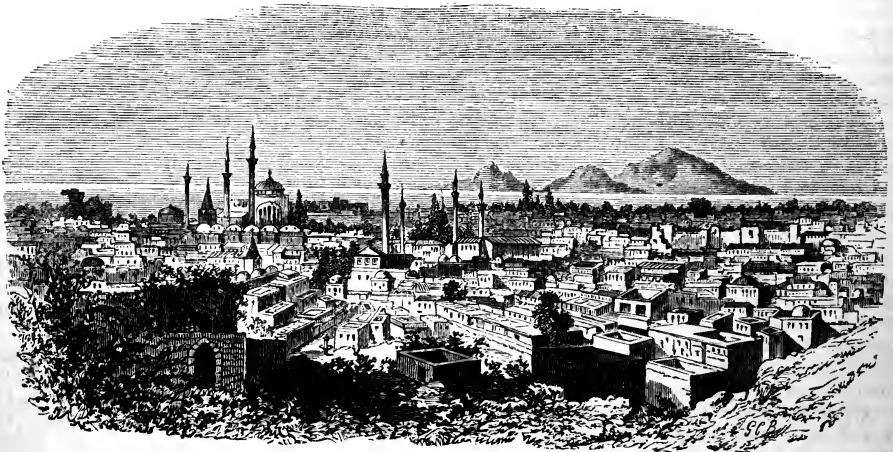
**KOMORN.** See COMORN.

**KONG**, a mountain range of W. Africa, running E. and W. nearly parallel with the coast, on the N. frontier of Upper Guinea, and terminating on the Atlantic in a number of promontories, the principal of which are Capes Verga and Sierra Leone. Its E. termination is not defined. Du Chaillu extends the name to the mountains which, connecting with those just described near the river Niger, extend southward, in a direction generally parallel to the coast of Lower Guinea, and send off several branches toward the sea. One of these ramifications, the Serra do Cristal, extends from

near Fernando Po island to the river Muni in lat. 1° N., and then returning inland rejoins the main range. Further inland, according to Du Chaillu, another offset called the Nkoomoo-Nabooalee mountains runs E. and W. The Kong mountains are very imperfectly known. The W. division does not exceed 2,500 ft. in average height, but in some places is believed to reach the limit of perpetual snow. Granite, marble, and limestone are the prevailing rocks.

**KONGSBERG**, a town of Norway, in the province and 45 m. S. W. of the city of Christiania, at the foot of the Jonsknuden mountain, and near the Larbröfos waterfall, on the Laagen river; pop. about 5,000. It contains a handsome church, and is renowned for its silver mines, the only ones in Norway. They were discovered in 1623, and are worked by the government, which has established here the mint and mining department, powder mills, and smelting works for manufacturing cobalt and reducing and refining the silver ore. The annual yield of silver exceeds 30,000 lbs. A specimen of native silver found in the principal mine, which is 180 fathoms deep, measuring 6 ft. long, 2 ft. broad, and 8 in. thick, is in the Copenhagen museum; and other enormous masses have been found at various times.

**KONIEH**, or *Koniah* (anc. *Iconium*), a city of Asia Minor, capital of the vilayet of its name, about 280 m. S. E. of Constantinople; pop. about 40,000. The stout walls which surround



Koniah.

it were built from the ruins of ancient Iconium by the Seljuk sovereigns, and display some interesting Greek inscriptions and other relics, which were so arranged in the mason work as to remain visible. Of more than 100 mosques which the city contains, 12 are large, and two are much admired for their magnificence. It has also several *medreses* or colleges, and the tomb of Mevlevi Jelal ed-Din, a Mussulman saint much revered throughout Turkey and

the founder of the Mevlevi or whirling dervishes. This tomb is surmounted by a dome resting upon a cylindrical tower of a bright green color, and is an object of pilgrimage. Beyond the walls are suburbs as populous as the town itself. There are extensive gardens, and the surrounding country is in a high state of cultivation, supplying grain and flax in abundance. Like all Turkish towns renowned for superior sanctity, Koniah is full of der-

vishes, who subsist on alms. The inhabitants are principally engaged in the manufacture of carpets, and of blue and yellow leather. They carry on a lively trade with Smyrna.—The ancient Iconium, which is mentioned by Xenophon, Cicero, and Strabo, and in the history of the apostles, was the capital of Lycaonia, but rose to importance only after the taking of Nicæa by the crusaders. The Seljuk sovereigns of Roum made the town their capital in the latter part of the 11th century; Frederick Barbarossa assaulted it in 1190; the sons of Genghis Khan subsequently became masters of it; and Bajazet II. made it the capital of Caramania in 1486. Ibrahim Pasha won here a decisive victory over the Turks, Dec. 30, 1832.

**KÖNIGGRÄTZ** (Boh. *Hradec Králové*), a fortified town of Bohemia, at the junction of the Adler and the upper Elbe, 65 m. E. by N. of Prague; pop. in 1870, 5,515. It is the capital of a large circle, has four suburbs, and is the seat of a bishopric. It contains an old palace and a fine cathedral, and musical instruments, gloves, wax candles, and other articles are manufactured. It is famous for the victory achieved in its vicinity, July 3, 1866, by the Prussians over the Austrians, generally known as the battle of Sadowa. (See SADOWA.)

**KÖNIGINHOF** (Boh. *Kralodvor*), a town of Bohemia, on the Elbe, 62 m. N. E. of Prague; pop. in 1870, 6,222. In the spire of the parish church the *Rukopis Kralodvorsky*. ("Manuscript of Königinhof"), a collection of epic and lyric Bohemian poems, was discovered in 1817 by Hanka. Many critics doubt its genuineness, while others, including Palacky, assign its origin to the end of the 13th or the beginning of the 14th century.

**KÖNIGSBERG**, a fortified city of Prussia, capital of an administrative district and circle of the same name, in the province of East Prussia, on the river Pregel, about 5 m. from its entrance into the Frisches Haff, an inlet of the Baltic, 335 m. N. E. of Berlin, and 75 m. E. N. E. of Dantzic; pop. in 1871, 112,123. The city is subdivided into the Altstadt on the west, the Lößenicht on the east, both lying high, and the Kneiphof, a low island on the Pregel, which is crossed by seven stone bridges and an iron railway bridge. There are also four suburbs. A railway connects Königsberg with Berlin on the one hand and with St. Petersburg on the other. Its port is Pillau, 20 m.

W., on the Baltic, at the entrance of the Frisches Haff. There is a considerable trade, mostly with Great Britain; the exports are breadstuffs, flax, hemp, oil seeds, bones, timber, &c.; the imports, colonial produce, iron, coal, cotton, and raw sugars. The chief manufactures



Königsberg Cathedral.

are textile fabrics, soap, leather, and starch. Sugar and silver refining, brewing, and distilling are carried on. Much amber was formerly found here, but the production has fallen off. The sturgeon fishery is important. The entrances and clearances in 1871 amounted to 3,276 vessels of 563,046 tons. The navigation of the river averages an annual entrance and clearance of 8,900 vessels. The city has 21 churches, a synagogue, an exchange, a city hall, a theatre, two theological seminaries, three gymnasia, schools of all branches of fine arts, science, industry, and commerce, six hospitals, deaf and dumb and blind asylums, and many other charitable institutions. The most imposing public building is the cathedral, a Gothic structure, in which the religious service of the Reformed church was introduced in 1523. In a porch outside of the cathedral rest the remains of Kant, who was a native of Königsberg. The Schloss, or palace, now used for government offices, was once the residence of the grand masters of the Teutonic order, by whom the city was founded in 1255-'7, and also of the first dukes of Prussia. The university, founded in 1544 by Duke Albert, and hence called the Albertine university, was in a prosperous condition in the 16th century, when the attendance of students, now only 600, was nearly 2,000. Since the castle and city libraries were placed in the university, it has a library of 220,000 volumes, numerous manuscripts, and valuable collections of incunabula and engravings. It also contains five clinical schools, a botanic garden, and a celebrated observatory, which was under the di-

rection of Bessel until his death in 1846, and contains one of the finest meridian globes in the world, prepared by Reichenbach. The first rector of the university was Georg Sabinus, the son-in-law of Melancthon. It became celebrated as the place where the philosophy of Kant was first propounded. Besides Kant, the names of Hamann, Hippel, Herder, Fichte, Herbart, and Jacobi are associated with the institution. The new university buildings were completed in 1862. Königsberg, which had been fortified by detached forts since 1843, has now been made one of the strongest fortresses of Prussia.

**KÖNIGSHÜTTE**, a town of Prussia, in the province of Silesia, formed in 1869 by the consolidation of the former domain of Königshütte, which in 1864 had only 1,144 inhabitants, and several adjacent domains, 100 m. S. E. of Breslau; pop. in 1871, 19,546. It is one of the chief centres of the mining industry in the eastern portion of Prussia, and is the seat of a mining board which is subordinate to the supreme mining board of Breslau. The produce of raw iron amounted in 1870 to about 1,000,000 cwt. About 3,000 workmen are employed in the government coal mines, which produce about 16,000,000 cwt. annually.

**KÖNIGSMARK**. I. **Philip Christopher**, count of, a Swedish adventurer, born about 1650, killed July 1, 1694. While a colonel in the Swedish service he went to the court of Hanover in 1692. The prince elector (subsequently George I. of England) had married his cousin Sophia Dorothea, daughter of the duke of Celle, a princess celebrated for her beauty. Alienated from her husband by his gloomy and jealous character, Sophia was attracted by Königsmark, whom she had known when young, and availed herself of his offer to aid her to fly from the court of Hanover, where she was most unkindly treated, to France. Their interviews were watched, and one evening on quitting her he was assassinated by order of the elector. Dr. Doran, in his "Lives of the Queens of the House of Hanover," endeavors to exonerate the princess from a guilty love for the gallant Swede; but the fact of its existence is established by the letters which she exchanged with him, published by Palmblad (Leipsic, 1847). II. **Maria Aurora**, sister of the preceding, born probably in Stade about 1670, died in Quedlinburg, Feb. 16, 1728. She was an orphan, and went while yet a young girl to Dresden, hoping to recover by royal intervention her property, which was kept from her by Hamburg bankers. Augustus the Strong, the elector of Saxony and future king of Poland, made her his mistress, and by him she became mother of the celebrated Maurice of Saxony (Marshal Saxe). She was considered one of the most beautiful and accomplished women of her age. The last years of her life she spent in retirement as prioress of Quedlinburg. She left in manuscript a number of dramatic pieces and poems. The memorable incidents of her

life were published by Cramer, *Denkwürdigkeiten der Gräfin Königsmark* (2 vols., Leipsic, 1836), and a biography was written by Palmblad (6 vols., Leipsic, 1848-'53).

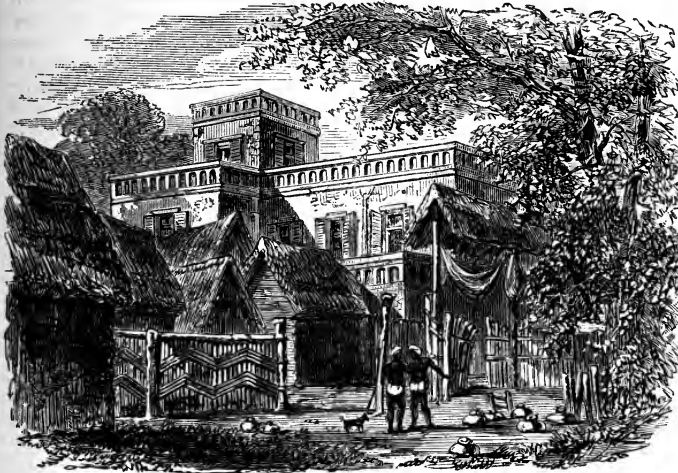
**KÖNIGSTEIN**, a town of Saxony, at the confluence of the Biela with the Elbe, 18 m. S. E. of Dresden; pop. about 3,000. It is noted for its picturesque situation opposite the fortress of Königstein, a formidable stronghold upon a mass of rock 800 ft. high, on the left bank of the Elbe. The fortress is accessible only through a strongly defended passage on the northwest. A well, cut in the solid rock to a depth of 600 ft., supplies the garrison with water, and casemates, likewise excavated, contain storehouses for provisions. By virtue of the military convention of Feb. 7, 1867, it was partly garrisoned by Prussians. According to the German constitution of 1871 the commander is appointed by the emperor, though the garrison now consists exclusively of Saxon soldiers.

**KOODOO**. See ANTELOPE.

**KOOMASSIE**, or **Coomassie**, a town of W. Africa, capital of Ashantee, about 105 m. N. by W. of Cape Coast Castle; pop. (previous to its destruction in 1874) about 15,000. Its site is on the declivity of a hill of ironstone, around whose base flows the Suabin, a sluggish stream, which in the rainy season transforms the neighborhood into a swamp. Beyond it a dense forest extends to the coast on the south and several days' journey to the north. The town occupied a parallelogram about a mile in length by half a mile in breadth, and was laid out in squares, with broad, straight, and well kept streets. The principal ones, which were shaded with fine banian trees, were bordered with picturesque houses and verandas in front and projecting roofs, each having a large public room opening directly on the street, and smaller private rooms behind. The walls were of wattle work plastered with clay, the lower part colored with red ochre, the upper with white clay and ornamented with arabesque designs. In the rear of these houses, which were the residences of the chief men, were other buildings arranged in quadrangles, the homes of the slaves and retainers. N. of the road leading to Juabin was the king's palace, a collection of buildings and courtyards covering an area of five acres and surrounded by a palisade of bamboo 8 ft. high. It served at once as the royal abode, harem, mausoleum, and military magazine. The king's private residence was a strongly built edifice of two stories, of quarried stone plastered with lime mortar, enclosing a quadrangle 24 by 20 ft. It had a flat roof, and was fitted with battlements and loopholes for musketry. Within the town and extending nearly into its centre was the grove into which were thrown the bodies of the victims of the annual sacrifices, numbering frequently hundreds at a time.—Koomassie had little trade and no manufactures of consequence, it being chiefly the place of residence of the sovereign and the nobles. It was founded about 1720.

On Feb. 4, 1874, it was captured by the British under Gen. Sir Garnet Wolseley, and on the morning of the 6th the town was destroyed by fire, and the palace blown up; but it was soon after reoccupied by the natives, who immediately began to rebuild it. Within a few months

indolent, and indisposed to labor or to adopt civilized ideas. They live on fish, camash and other roots, grain, fruit, and berries, and are very poor. They roamed chiefly on the head waters of the Clark and McGilvray rivers, seldom hunted buffalo, but took elk, deer,



The King's Palace in Koomassie.

after its capture several volumes were published in London descriptive of the campaign, chiefly by newspaper correspondents: "The March to Coomassie," by G. A. Henty of the London "Standard;" "Coomassie and Magdala," by Henry M. Stanley of the "New York Herald," &c. (See GOLD COAST.)

**KOOR.** See KUR.

**KOORDISTAN.** See KURDISTAN.

**KOORILE ISLANDS.** See KURILE ISLANDS.

**KOOSO, Kosso, or Cusso,** the Abyssinian name of the flowers and tops of *Brayera anthelmintica*, a small tree of the order *rosaceæ*, growing on the high table land of Abyssinia. These are brought to Europe in a dry, compressed, greenish yellow mass. This drug has been long used by the natives of the country whence it comes as a remedy for tapeworm, and it has been introduced into European practice. It appears to act principally as a poison to the parasite, though it sometimes produces nausea or even vomiting and diarrhœa. It is given in the form of powder mixed with warm water in the dose of half an ounce for an adult. The active principle has not been determined with certainty, though the drug contains among other substances a resin, a volatile oil, a crystallizable acid, and extractive matter.

**KOOTENAYS,** a tribe of Indians in the northwest of the United States, with some bands in British Columbia. They form a distinct family, as shown by their language, from the Flatheads, with whom they have long been allied. They comprise the Kootenays and the Flatbows, and are known through the country as the Skalzi. They are gentle, amiable, honest, but cowardly,

Rocky mountain sheep, birds, and fish. They welcomed Father De Smet, and built a large chapel on the Tobacco Plain, but from their thriftless life have made little progress, except a few under Eneas, who reside somewhat permanently on Flathead lake. In 1872 there were 320 Kootenays in Montana, with the Flatheads and Pend d'Oreilles, sharing their vicissitudes and removal to Jocko; 400 in Idaho, 400 in British Columbia, and some in Washington territory. Those in Idaho, by executive order of June 14, 1867, were removed to a reservation of 250,000 acres set apart for them.

**KOPISCH, August,** a German poet and painter, born in Breslau, May 26, 1799, died in Berlin, Feb. 3, 1853. While in Italy, in his early life, he was one of the discoverers of the blue grotto in the island of Capri. Among his most popular poems are the "Song of Noah" and other witty and humorous pieces. He also translated Dante. His *Gesammelte Werke*, edited by K. Bötticher, appeared in Berlin in 1856, in 5 vols.

**KOPITAR, Bartholomäus,** a Slavic philologist, born at Repnje, Carniola, Aug. 23, 1780, died in Vienna, Aug. 11, 1844. He studied at Laybach, and became a private tutor. In 1807 he went to Vienna, where he found employment in the imperial library, of which he became first director shortly before his death, with the title of councillor. He was prominent among the scholars who have brought light into the more obscure parts of Slavic ethnology, philology, and literature. His works include *Grammatik der slawischen Sprache in Krain*, &c. (Laybach, 1808); *Glagolita Clozianus* (Vienna, 1836); and posthumous minor essays on Slavic philology, ethnology, history, and jurisprudence, edited by Miklosich (Vienna, 1857).

**KOPP, Joseph Eutych,** a Swiss historian, born at Beromünster, Lucerne, in 1793, died Oct. 25, 1866. He was professor of Greek at Lucerne from 1819 to 1841, and afterward a member of the council of state and president of the board of education till 1845, when he was removed on account of his opposition to the restoration of the Jesuits. He has been called the Niebuhr of Switzerland. In his *Urkunden zur*

*Beleuchtung der Geschichte der eidgenössischen Bünde* (2 vols., Lucerne, 1835-'51), he disproves the authenticity of the story of William Tell, and questions the propriety of the Swiss rising against the emperor Albert. His principal work, *Geschichte der eidgenössischen Bünde* (5 vols., Leipsic, 1845-'62), was continued after his death by Alois Lütolf and Arnold Busson (Berlin, 1872).

**KOPPARBERG** (formerly FAHLUN), a län or district of Sweden, in the province of Svealand, bounded N. by Jemtland, E. by Gefleborg, S. and S. W. by Westmanland, Örebro, and Wermland, and W. by Norway; area, 11,230 sq. m.; pop. in 1872, 178,890. It is very mountainous, and contains several valleys and branches of the river Dal and its tributaries. Rye, barley, and oats thrive chiefly in the southeast. Cattle are extensively reared, and the lakes and rivers abound in fish. But the prosperity of the district is mainly derived from its great wealth of timber and minerals. The copper mines are the largest in Sweden, and porphyry is converted here into many fine articles, and ironware is made in large quantities. The inhabitants are Dalecarlians, and their district was long known as a province under the name of Dalecarlia. Capital, Fahlun.

**KÖPPEN, Friedrich**, a German philosopher, born in Lübeck, April 21, 1775, died in Erlangen, Sept. 5, 1858. He studied theology in Jena, but he attended also the lectures of Reinhold and Fichte, and after spending a year in Göttingen he published his first work, *Abhandlung über Offenbarung, in Bezug auf Kant'sche und Fichte'sche Philosophie* (Lübeck, 1797), which passed through several editions. Next appeared his polemical disquisition on Schelling's philosophical system, entitled *Schelling's Lehre, oder das Ganze der Philosophie des absoluten Nichts* (Hamburg, 1803). He adopted in general the opinions of Jacobi, and his subsequent works, *Darstellung des Wesens der Philosophie* (1810), *Philosophie des Christenthums* (1813-'15), *Politik nach Platonischen Grundsätzen* (1818), and *Rechtslehre nach Platonischen Grundsätzen* (1819), attempt to demonstrate the compatibility of critical philosophy and Christianity, basing faith and morality on personal consciousness. He preached in Bremen from 1804 to 1807, and was afterward professor in the university of Landshut until its dissolution in 1826, when he accepted a chair in Erlangen. In 1840 he published anonymously a *Philosophie der Philosophie*.

**KÖPPEN, Peter von**, a Russian archæologist, born in Kharkov, Feb. 19, 1793, died at Karabagh, Crimea, June 4, 1864. He studied in the university of Kharkov, and devoted himself at once to researches on the history, ethnology, and material condition of the Russian empire. The first fruit of his labors was the *Uebersicht der Quellen einer Literaturgeschichte Russlands* (St. Petersburg, 1818), which was followed in 1822 by a collection of Slavo-Russian antiquities and facsimiles of manuscripts. His *Nord-*

*gestade des Pontus* (Vienna, 1823), *Die dreigestaltete Hekate und ihre Rolle in den Mysterien* (1823), and his articles in German periodicals on the antiquities and arts of Russia, furnished valuable materials for archæological researches. In 1827 appeared his *Materialien zur Culturgeschichte Russlands*. At this time he entered the service of the government, investigated the productiveness and hydrography of the provinces of southern Russia, and published several works on the results of his researches. His numerous travels through the empire gave him a thorough acquaintance with the various elements of the population, and he published in the following years several highly esteemed ethnological works, among them *Ueber die Nationalität der Bewohner verschiedener Gouvernements, Ueber die Vertheilung einzelner Völkerstämme*, and *Ueber die Deutschen im Petersburger Gouvernement*. The final result of these labors was a large ethnological chart of European Russia, published in 1851. His last important work is an exhaustive treatise on the ninth census, *Deviataya reviza* (St. Petersburg, 1857). He spent his last years on the estate of Karabagh, presented to him by the emperor.

**KORAN**, or **Alkoran** (Arab. *qur'ân*, the reading, or that which ought to be read; hence, "the book"), the sacred book of the Mohammedans. It is their chief authority not only in matters of faith, but in all others, whether political, military, or ethical. Among its numerous designations, *Furqân*, that which distinguishes (between good and evil), *Al-Kitâb*, the book, *Al-Moshaf*, the volume, and *Al-D'îkr*, the admonisher, are of most frequent occurrence. It consists of 114 *surâs* or chapters, each bearing a title which either affords a key to the contents, or is merely a word contained in it used as a heading. Thus the second sura is headed "Cow," which word occurs only in the 63d verse, where it is said that Moses commanded the Israelites to sacrifice a cow. Twenty-nine suras commence with letters of the alphabet believed to bear a mystical signification. With the exception of the ninth, each sura begins with the formula *Bism-illâhi er-rahmani er-rahîmî*, "In the name of the God of pity and mercy." The first sura, or the sentences that open the Koran, is the model prayer of the Mohammedans, and bears several titles, such as the *Fatihah* (exordium), "The Mother of the Koran," "The Pearl," "The All-sufficient." The words are these: "Praise be to God, the lord of the world, the pitying and merciful, the sovereign judge in the day of retribution! Thou art he whom we adore! Thou art he whom we implore to help us! Lead us in the straight way; in the way which thou hast strewn with benefits, and which leadeth not into error!" The other suras are arranged almost entirely according to the number of verses they contain, the longest being the second, and the shortest the last. The suras are divided into *âyats* or verses. For the purpose of recitation in the mosques, the Koran is



divided into 30 *adzds* or parts, and 60 *asabs* or sections, each of four portions. As Mohammed continued his revelations during 23 years amid many vicissitudes, there is often but little connection between the suras, or the verses of each sura. According to the various occasions on which they were delivered, some portions contain dogmas, others conversations with God, rules of conduct, arguments in defence of doctrines, threats and promises, &c. It is generally believed that Mohammed was wholly unacquainted with writing, and dictated the passages of the Koran to amanuenses. The arrangement of the chapters and verses was made, according to the tradition of Ibn Abbas, during the lifetime of the prophet, and many Mohammedans believe that the other divisions were also made under his supervision. The style of the Koran is rather rhetorical than poetic, and its contents are to a large extent drawn from the ancient traditions of the Arabs, the Hebrew Bible, the Christian New Testament, the Talmud and Midrash of the later Jews, the tenets of the Magi, and many apocryphal writings, the so-called *protevangelia*. These materials, of course, suffered many changes and perversions.—The Mohammedans believe that the revelations delivered to Mohammed from time to time were of two kinds: first, those wherein were given the words delivered by the prophet; and secondly, those in which was given the sense of what he afterward communicated in his own words. Mohammed's revelation, according to the Koran, resulted from his being transported in a vision from Mecca to Jerusalem, and thence to heaven, where he "really beheld some of the greatest signs of his Lord." This is all that the Mohammedan is bound to believe concerning the revelation of the Koran; but the *hadises*, or traditions, which contain long and wondrous details of this vision, are also believed in by many; and these consider Mohammed's journey to heaven as real, or as having been performed by the prophet in the body. These traditions are known as "the splitting or opening of the chest," and the "night journey." Leaving the minor variations of the story unnoticed, the *hadises* narrate that on the night of the celestial journey the roof of Mohammed's house in the city of Mecca was suddenly removed; the angel Gabriel descended and touched the heels of the prophet, who was lying on his back; when he awoke, the angel cut open his breast to below his navel; then a white animal, somewhat between a mule and an ass, called *borak*, was brought, and they rode to Jerusalem, where they performed certain rites; they ascended thereupon through the heavens, meeting Adam in the first, Jesus and John in the second, Joseph in the third, Aaron in the fourth, Edres in the fifth, Moses in the sixth, and Abraham in the seventh; then they were taken up to the "boundary tree," and then to God, who "revealed to me what he revealed." After they had passed

from that place a heavenly herald proclaimed aloud, "I have established my commandments and made them easy to my servants." The tradition related by Omar represents Mohammed as declaring that when he returned from the heavens he alighted in the house of Khadijah, his wife, so soon that she had not even turned herself from one side to the other. The traditions that the Koran was brought down from heaven by the angel Gabriel, that it was written on the skin of the ram which Abraham sacrificed instead of his son Isaac, that it was bound in silk and ornamented with gold and pearls, and similar ones, are believed in by very few, and form no part of the Mohammedan religion.—The compilation of the fragments of the Koran was not undertaken until after the death of Mohammed. Portions of it were scattered among his disciples, either written on parchment, bones, stones, and palm leaves, or merely committed to memory; and when in the ensuing contests with the rebellious people of Yemamah many of the Moslems were slain who knew large portions of the Koran by heart, it was feared that much of it might be lost, and Omar caused the caliph Abu Bekr to collect all he could. Said ibn Said was intrusted with this work, and the copy of his compilation remained in the possession of Abu Bekr. At the death of the latter the Koran was handed to Omar, who bequeathed it to his daughter Hafsa, a widow of the prophet. The Moslems continued to read and recite their Koran as they could until about ten years later, when the caliph Othman employed the same Said ibn Said and several other Koreishites to write a number of copies of Hafsa's Koran, revising it, and making additions to it wherever needed. These copies were to constitute the final authority for the reading of the text, and in order to avoid all further disputes Othman ordered the destruction of all other copies except Hafsa's; but hers was subsequently also destroyed by the caliph of Medina. While thus a great injury was inflicted upon theological criticism, it was, politically speaking, a wise procedure to reduce the Koran, which had to serve also as a civil and criminal code, to a single reading. This revised text is the Koran which has descended to our day.—Criticism has been greatly concerned in discovering wherein this last revision consisted. A careful reading of the present Koran shows that many passages are mere fragments, which were added without careful selection to other portions of it. It is not believed that the revisers excluded anything that belonged to the Koran except what was not sufficiently authenticated as forming a part of it. It is also not likely that they attempted a systematic arrangement of the suras, because each of them treats of a great number of subjects. A chronological order was also impossible, because accurate accounts of the older pieces were already wanting, and also because fragments of different periods had already been placed in permanent

connection with other portions of the Koran. For a proper understanding of the Koran a restoration to chronological order would be necessary, and this is apparently impossible. The Moslem traditions in regard to the time when Mohammed revealed a particular sura have to be admitted with great caution; and besides being frequently contradictory among themselves, they throw but little light on the suras which were given out before Mohammed's flight to Medina. The difference of the position which the prophet held before and after this event could not fail to become apparent in the general character of his sayings. The suras of the earlier epoch may be recognized by their intense enthusiasm; they are generally short: Mohammed has visions of angels, of the day of retribution, and of God, and his animadversions on his enemies are replete with passion and anger. The later suras still contain some of the old fire, but their general tenor is calm and prosaic, and most of them seem to be little else than general army orders and portions of a civil and criminal code. A necessary consequence of the fragmentary composition of the Koran was frequent contradictions. Mohammedan divines have, however, surmounted the difficulties arising from these. When there are two contradictory laws on one and the same subject, they explain the one as being *munsukh*, and the other as *nasikh*. They say that such commandments were given under different circumstances, and that when one of the circumstances was wanting the commandment relating thereto was void, or *munsukh*; and that then the commandment became in force, or *nasikh*, which was intended to meet the altered circumstances. (For theological and sectarian interpretations of the text, see MOHAMMEDANISM. For the dialect in which the Koran is written, and the native literature to which it has given rise, see ARABIC LANGUAGE AND LITERATURE.)—It is common in the Orient to ascribe every ancient manuscript of the Koran to the time and even the hand of one of the first caliphs, and several libraries boast of possessing the earliest copy written by Othman himself, while it is very doubtful whether he was personally engaged in the revision of the text. Thus it is said that there are manuscript Korans of the age of Othman and Ali at Constantinople, Damascus, and Cairo. It is believed that some portions of it now preserved at Copenhagen date from the first century of the hegira. Printed editions have been prepared by Pagninus Brixiensis (Venice, 1509 or 1518, burnt by order of Clement VIII.); Hinkelmann (Hamburg, 1694), the oldest now known; Mollah Usman Ismael (St. Petersburg, 1787), with valuable marginal notes; and G. Flügel (Leipzig, 1834), revised by Red-slob (1837, 1842, and 1858). The following are editions of the original with versions: *Muzih-i Koran*, with a Hindustani interlinear version and notes, by Maulana Shah Abdel Ka-

der, Calcutta, 1829-'32; with an English version, Serampore, 1833, and Persian commentaries, Calcutta, 1837. There are English translations by Alexander Ross (London, 1649; new ed., 1871), G. Sale (2 vols., London, 1734), and Rodwell (London, 1861). The history of the Koran is given by Nöldeke, *Geschichte des Qurâns* (Göttingen, 1860), and by Sprenger in his valuable work, *Das Leben und die Lehre des Mohammed* (3 vols., Berlin, 1868). The essays "On the Holy Koran," "On the Mohammedan Traditions," and "On the Mohammedan Theological Literature," by Syed Ahmed Khan Bahadoor (London, 1870), are interesting as the opinions of a learned Mussulman.

**KORAT**, a neutral territory of Asia, governed by an independent prince, on the boundaries of Siam and Cambodia; pop. about 60,000. The people are chiefly engaged in making sugar and in copper mining. The capital, of the same name, 138 m. N. E. of Bangkok, has about 7,000 inhabitants. It is on an elevated plateau, accessible only by ascending a thickly wooded steep, called Dorg Phaja Fai, "forest of the king of fire," on account of its gloomy aspect and foul atmosphere.

**KORDOFAN**, a country of E. Africa, subject to the khedive of Egypt, lying between lat. 12° 30' and 15° 30' N., and lon. 29° and 32° E., bounded N. by Nubia and S. by the Deir mountains, and separated by strips of mostly desert land from the White Nile on the E. and Darfoor on the W.; pop. estimated at 400,000. The surface is in general level, but in the southwest and extreme north it is rather mountainous. There are no permanent rivers, but several small lakes exist in different parts of the country. The climate is very unhealthy in the rainy season, and in the dry intolerably hot; hurricanes are frequent. The soil is naturally fertile. In the wet season the earth is covered with a luxuriant vegetation, but during the drought everything is burned up. The population consists of negroes, Arabs, and emigrants from Dongola. This country was for a long period tributary to the empire of Sennaar; it was taken in the latter half of the 18th century by the king of Darfoor, and was conquered by Mehemet Ali about 1820, who was confirmed in the possession of it by a firman issued by the sultan, Feb. 13, 1841. Slavery was abolished there in 1857. Capital, Obeid, or El Obeid.

**KORNEGALLE**, a town of Ceylon, 55 m. N. E. of Colombo, noted for its beautiful situation within the shade of a stupendous rock, for the remains of a city, once one of the capitals of Ceylon, and for an ancient temple where the footprint of Buddha is hollowed in the rock, in the same manner as on Adam's Peak, and to which pilgrims resort from the most distant part of the island. The place is surrounded by dense forests, and every cottage of the modern town has a garden.

**KÖRNER**, Karl Theodor, a German poet, born in Dresden, Sept. 23, 1791, killed near Rosenberg, Mecklenburg, Aug. 26, 1813. His father



intended him for scientific pursuits, and sent him to the mining academy of Freiberg; but he early displayed a strong taste for poetry, inspired by Schiller, who was an intimate friend of his father, and in 1810 published his first volume of poems under the title of *Knospen*, or "Buds." Having studied for a short time at the university of Leipsic, he went to Berlin, and soon after to Vienna, where he wrote his dramas *Toni* and *Hedwig*, and the tragedies *Zriny* and *Rosamunda*, and was appointed poet to the *Burgtheater*. During the German "war of freedom" against Napoleon Körner joined the "black huntsmen" of Lützow (March, 1813), with whom he entered Saxony. His bravery soon gave him a reputation and the rank of lieutenant. It was during this exciting life that he wrote those patriotic songs which, set to music by Weber, have since become so well known. During the night of Aug. 25, 1813, while waiting in a wood to attack a small detachment of French troops, he wrote his celebrated *Schwertlied*, or "Sword Song." At 7 o'clock on the morning of the 26th Lützow attacked the French, who took refuge in the wood while Körner pursued them. Between the fires of his own men and the enemy he was mortally wounded. His corpse was crowned with oak leaves and buried beneath an old oak, near the village of Wöbelin. Near the spot is now placed a fine monument of iron, designed by the architect Thormayer, which has become a place of great resort for visitors. A selection of his battle songs was prepared by his father and published under the title of *Leier und Schwert* (Berlin, 1814). His complete works were published by the direction of his mother, and edited by Streckfuss (1 vol., Berlin, 1834; 4 vols., 1838). His "Life, written by his Father, with his Selections from his Poems, Tales, and Dramas," translated from the German by G. F. Richardson, appeared in London in 1845.

**KÖRÖS**, or **Nagy-Körös**, a town of Hungary, in the county and 42 m. S. E. of the city of Pesth, on the railway to Szegedin; pop. in 1870, 20,091. It has a gymnasium. The inhabitants are mostly Magyars, and chiefly engaged in raising stock and in cultivating wine and corn.

**KORTEZT**, or **Cortitz**, an island of Russia, in the Dnieper river, 165 ft. above its level, in the government and about 40 m. south of the town of Yekaterinoslav. It is surrounded by masses of granite, and was a stronghold of the Cossacks until their removal in 1784, when the island, with its 16 villages, of which the principal one is named Kortetz, was selected by Catharine II. for a settlement of German Mennonites, who are chiefly agriculturists. It has manufactures of cotton and woollen goods.

**KORTÜM**, **Johann Friedrich Christoph**, a German historian, born at Eichhorst, Mecklenburg-Strelitz, Feb. 24, 1788, died in Heidelberg, June 4, 1858. He was successively a teacher in Fellenberg's school at Hofwyl and in other

places, and professor of history at Basel, Bern, and Heidelberg. His principal works are *Geschichte des Mittelalters* (2 vols., Bern, 1836-'7), *Geschichte Griechenlands* (3 vols., Heidelberg, 1854), and *Geschichte Europas im Uebergange vom Mittelalter zur Neuzeit*, edited by Reichlin-Meldegg (2 vols., Leipsic, 1861).

**KORTÜM**, **Karl Arnold**, a German poet, born at Mühlheim on the Ruhr, July 5, 1745, died in Bochum, Aug. 15, 1824. He was a physician, and is known for his humorous and satirical poetry, including *De Jobsiade*, an epic (3 parts, Münster, 1784; 11th ed., Leipsic, 1865; English translation by the Rev. C. T. Brooks, Philadelphia, 1863).

**KORVEI**, or **Corvey**, a village of Westphalia, Prussia, in the district and 42 m. S. E. of Minden, on the left bank of the Weser; pop. about 600. It is beautifully situated, and has a harbor and an annual fair. It is the residence of Prince Victor of Hohenlohe-Schillingsfürst, upon whom the title of duke of Ratibor and prince of Corvei was conferred in 1840. The church is a fine Gothic building, and the palace contains a large library and a collection of rare illustrated works.—Corvei acquired celebrity through a Benedictine abbey, founded early in the 9th century by the emperor Louis le Débonnaire as a branch of that of Corbie in Picardy, whence the name (*Corbeia Nova*). It was directly under the authority of the pope, and became next to Fulda the greatest missionary centre for the diffusion of Christianity. Among its members were Anscarius, the apostle of the north, Bruno, who became pope as Gregory V., Wittkind, Wibald, and other renowned personages. A copy of Tacitus, with the only manuscript extant of the first six books of the "Annals," was discovered in the extensive library of the abbey in 1514, but was taken away, and is said to have passed into the hands of Pope Leo X., and to have been transferred to Florence. The abbey had a vote in the German diet, and claimed possession of the island of Rügen, which according to tradition had been given to it by the emperor Lothaire. At the end of the 18th century Pius VI. promoted the abbey to a see; and after having belonged to the duchy of Nassau (1803) and the kingdom of Westphalia (1807), it was allotted to Prussia in 1815. The abbey was suppressed by the pope in 1816, while the king of Prussia in 1821 raised the territory belonging to it to a principality, which was bestowed on the landgrave of Hesse-Rheinfels-Rothenburg, and subsequently inherited by Prince Hohenlohe-Schillingsfürst. Among the most renowned intellectual treasures of the former abbey was the *Chronicon Corbeense*, long regarded as a high authority on mediæval history. It was first edited in 1824, but its genuineness has been impugned by Ranke and others. The *Annales Corbeenses*, however, included in vol. iii. of Pertz's *Monumenta Germaniæ Historica*, are regarded as authentic. (See Wigand, *Die Korweischen Geschichtsquellen*, Leipsic, 1841.)

**KOSCIUSKO**, a N. county of Indiana, drained by Tippecanoe river; area, 567 sq. m.; pop. in 1870, 23,531. The surface is undulating and the soil mostly productive. It is diversified with several lakes and prairies. The Pittsburgh, Fort Wayne, and Chicago, and the Cincinnati, Wabash, and Michigan railroads pass through it. The chief productions in 1870 were 523,502 bushels of wheat, 276,820 of Indian corn, 73,591 of oats, 75,755 of potatoes, 86,430 lbs. of wool, 448,364 of butter, and 18,005 tons of hay. There were 7,964 horses, 6,504 milch cows, 7,740 other cattle, 29,909 sheep, and 19,443 swine; 6 manufactories of carriages, 2 of woollen goods, 7 flour mills, and 37 saw mills. Capital, Warsaw.

**KOSCIUSKO, Mount.** See AUSTRALIA, vol. ii, p. 129.

**KOSCIUSZKO, Tadeusz (THADDEUS)**, a Polish patriot, born near Novogrudek, Lithuania, Feb. 12, 1746, died in Solothurn, Switzerland, Oct. 15, 1817. He was descended from a noble Lithuanian family, studied at the military academy of Warsaw, and was sent to the military school at Versailles to complete his studies at the expense of the state. On his return to Poland he rose to the rank of captain, but an unrequited passion for the daughter of the marshal of Lithuania induced him to leave his country. He embarked for America, where he received a commission as an officer of engineers, Oct. 18, 1776, and repaired to his post with the troops under Gates. He planned the encampment and post of the army on the range of hills called Bemis heights, near Saratoga, from which, after two well fought actions, Burgoyne found it impossible to dislodge the Americans. Kosciuszko was subsequently the principal engineer in executing the works at West Point, and became one of the adjutants of Washington, under whom he served with distinction. From Franklin he received the most marked expressions of esteem and commendation. Finally he was made a brigadier general, and was honored with the public thanks of congress, and with the badge of the Cincinnati. At the end of the war he returned to Poland, where he lived several years in retirement. In 1789, when the Polish army was reorganized, he was appointed a major general. He fought gallantly in defence of the constitution of May 3, 1791, under Prince Poniatowski against the Russians, and particularly in the battle of Zielence (June 18, 1792), and in that of Dubienka (July 17), where with but 4,000 men he kept at bay 15,000 Russians, and finally made his retreat without great loss. When King Stanislas submitted to the second partition of Poland, Kosciuszko resigned his commission and retired to Leipsic, where he received from the national assembly the citizenship of France. He was bent, however, on another effort for Poland. A rising of his countrymen was secretly planned, and Kosciuszko elected dictator and general-in-chief. Suddenly appearing at Cracow, March 24, 1794, he issued a manifesto against the Russians, and,

with a hastily collected host, armed mostly with scythes, advanced to meet the enemy. At Raclawice (April 4) he routed with 5,000 men a Russian corps almost doubly strong, and returned in triumph to Cracow. He received reinforcements from some former Polish detachments, and, committing the conduct of government affairs to a national council organized by himself, moved forward in quest of the Russian army. His march was opposed by the king of Prussia at the head of 40,000 men, and Kosciuszko, whose force amounted to but 13,000, was defeated, June 6, 1794, at Szezecociny. Being unable to check the anarchy that existed everywhere in the land, Kosciuszko had laid down the dictatorship and now retired with his army to Warsaw, which city he defended with great success against the beleaguering Prussians and Russians. When the siege was raised, he reorganized his army, and went out to check the progress of the Russian forces under Suvaroff and Fersen, but was routed by their overwhelming numbers at Maciejowice, Oct. 10. Kosciuszko, falling covered with wounds from his horse, was captured by the Russians, and consigned to a prison in St. Petersburg. His imprisonment was rigorously continued during two years, until the death of Catharine, when the emperor Paul gave him his liberty, with many marks of esteem. The czar, on releasing his prisoner, offered him his own sword. "I have no need of a sword," said Kosciuszko; "I have no country to defend." No sooner had he crossed the Russian frontier than he sent back to the czar the patent of his pension, and every testimonial of Russian favor. Henceforth his life was passed in retirement. In 1797 he visited the United States, where he was received with great honor and distinction, and obtained from congress a grant of land, in addition to a pension which he had received since the close of the war. Taking up his abode thereafter in France, he lived chiefly at a country place near Fontainebleau, passing his time in agricultural pursuits. In 1806 Napoleon, about to invade Poland, desired to make use of the patriot; but Kosciuszko, under parole not to fight against Russia, refused to lend himself to his purpose. When the allies approached Paris in 1814, Kosciuszko observed a Polish regiment committing acts of pillage. Rushing forward, he upbraided the officers for their conduct. "Who is he who dares to speak thus?" they exclaimed. "I am Kosciuszko," he replied. The effect of his name upon the soldiers was electric. Throwing down their arms, they prostrated themselves at his feet, and supplicated his pardon. The emperor Alexander, who, in an audience subsequently, held him long in conversation, made him the most flattering promises. Kosciuszko repaired to Vienna, but after the battle of Waterloo he was strangely neglected, and soon left the seat of the great European congress. In 1816 he went to live in Switzer-

land, making his home at Solothurn, whence in the following year he sent a deed of manumission to all the serfs upon his Polish estate. His death was caused by a fall from his horse over a precipice. His remains were removed by the emperor Alexander to the cathedral church of Cracow, where they repose by the side of Poniatowski and Sobieski. Near Cracow there is a mound of earth 150 ft. high, which was raised to his memory by the people, earth being brought from every great battle field of Poland. From a fancied resemblance in shape to this tumulus, the loftiest known mountain in Australia has received the name of Mount Kosciusko.

**KOSEGARTEN**, Johann Gottfried Ludwig, a German orientalist, son of the poet Ludwig Theobul Kosegarten, born in Altenkirchen, Sept. 10, 1792, died in Greifswald, Aug. 18, 1860. He went to Paris in 1812 to study the oriental languages under Chézy and Sylvestre de Sacy. On his return to Germany in 1815 he was appointed to the chair of oriental literature at Greifswald, and in 1817 he accepted the same professorship at Jena, but returned in 1824 to Greifswald. Among his works are an edition of the *Moallaka* of the Arabian poet Amru ben Kethum (Jena, 1819); German translations of the Indian poem *Nala* (1820), and of *Tuti namah*, a collection of Persian tales, made in collaboration with Iken (Stuttgart, 1822); editions of the Arabian annals of Tabari (1831), of the collection of songs entitled *Kitáb al-Agháni* (1840), and of Indian fables entitled *Pantschatantra* (Bonn, 1848); *Die Geschichte der Universität Greifswald* (Greifswald, 1856-'7); and several works on the history of Pomerania.

**KOSEL**, a fortified town of Prussia, in the province of Silesia, on the Oder, and at the mouth of the Plodnitz, 25 m. S. S. E. of Oppeln; pop. in 1871, 4,517. It has a castle, two churches, a synagogue, and considerable trade. From 1806 to 1859 it was the capital of a duchy.

**KÖSLIN**, a town of Prussia, in the province of Pomerania, 85 m. N. E. of Stettin; pop. in 1871, 13,360. It is the seat of a court of appeal, and has four churches, a gymnasium, and a normal school. On the public place is the statue of Frederick William I., who in 1718 rebuilt the town when the larger portion of it had been destroyed by a conflagration. A railway connects it with Stettin.

**KOSLOV**. See Kozlov.

**KOSSUTH**, a N. county of Iowa, drained by a branch of Des Moines river; area, 576 sq. m.; pop. in 1870, 3,351. It has an undulating surface and a fertile soil. The Iowa and Dakota division of the Chicago, Milwaukee, and St. Paul railroad is in operation to the county seat. The chief productions in 1870 were 52,288 bushels of wheat, 65,137 of Indian corn, 67,825 of oats, 10,449 of potatoes, 86,131 lbs. of butter, and 7,442 tons of hay. There were 891 horses, 874 milch cows, 1,784 other cattle, 424 sheep, and 1,198 swine. Capital, Algona.

**KOSSUTH, Lajos (Louis)**, a Hungarian patriot, born at Monok, county of Zemplén, April 27, 1802. His family, of Slavic descent, were Lutherans and noble. His father, a lawyer, gave his children a liberal education. Lajos, the only son, received his first classical instruction in the gymnasium of the Piarists at Ujhely, studied at Eperies, and passed through a legal and philosophical course at the college of Patak. The spirit which animated this last institution has almost always been one of opposition to the rule of Austria. Kossuth was well read in history, and spoke with almost equal fluency Magyar, Slovak, German, French, and Latin, the last of which was still in part the legal language of his country. Shortly after leaving college, he was appointed an assessor in the assembly of his native county, and soon became noted as a liberal, exceedingly popular with the lower classes, and was for some time manager of the estates of the countess Szapáry in Zemplén. In the diet of 1832-'6 he was proxy of a magnate or member of the upper house, in which capacity he had a deliberative voice, but no vote, in the lower. This diet ranks among the more important assemblies of modern Hungary. Its debates, closely following the Polish tragedy of 1831, were watched with lively anxiety by the patriots, but their publication was hindered by severe restrictions. The opposition, at the suggestion of Kossuth, resorted to the extraordinary means of a written newspaper, the *Országgyűlési tudósítások* ("Parliamentary Communications"). Extracts and comments were dictated by Kossuth to a large number of copyists, and widely circulated. After the close of the diet Kossuth endeavored to continue his activity by a lithographic paper, *Törvényhatósági tudósítások* ("Municipal Communications"), edited in Pesth; but the government prohibited its publication. Kossuth resisted, putting himself under the protection of the county of Pesth. The government sent its prohibition to the latter. The assembly refused to obey, declaring all censorship unconstitutional. Numerous other counties supported Kossuth with equal zeal. He, with several other advocates of the popular cause, was seized in the night (May 2, 1837), tried for treason, and condemned to four years' imprisonment. A general outburst of indignation and an unprecedented agitation followed. The liberals carried the elections for the diet of 1839-'40, and answered the government propositions, the principal of which were demands for subsidies in money and men, with a demand for the liberation of the prisoners. The Thiers ministry in France threatened a general movement in Europe, which was then agitated by the Egyptian question, and the cabinet of Vienna was compelled to yield. Kossuth's liberation was hailed with loud demonstrations. The laws of 1840, enacted under the leadership of Deák, gave new vigor to the opposition. At this juncture Landerer, a publisher of Pesth, having received a license

for the publication of a semi-weekly journal, invited Kossuth to assume its direction. The *Pesti hírlap* ("Pesth Journal") started on Jan. 1, 1841, with fewer than 100 subscribers, but in a month they were numbered by thousands. The national, moral, and material regeneration of the whole people was its avowed aim; the existing constitution was to serve as a means, the aristocracy to have the lead. Count Stephen Széchenyi, in a book entitled *Kelet népe* ("People of the East"), denounced Kossuth as a dangerous agrarian and demagogue. Széchenyi was ready to bestow freedom on the people as a gift; Kossuth demanded it as a right, and threatened to extort it. Baron Eötvös declared in his favor in the pamphlet *Pesti hírlap és Kelet népe*. Public opinion was decidedly in favor of Kossuth, and the *Pesti hírlap* not only became the regular organ of the opposition, which again carried the elections in 1843, but also the oracle of the younger portion of the nation. A difficulty with the publisher, which was not believed to be accidental, removed Kossuth from the editorship, which was transferred to Szalay (July 1, 1844). Kossuth received no license for another journal, and as the new editor of his former organ belonged to a branch of the opposition to which he was most heartily opposed, he found no better medium for the occasional publication of his views than the *Hetilap* ("Weekly Paper"), a small industrial sheet. Hungary was exhausted by a tariff calculated to keep it for ever in a state of colonial dependence on the German provinces, which by another tariff were protected against the competition of England, France, and Belgium. This system formed one of the chief grievances of the nation. Assisted by the most influential members of the opposition, among others by Counts Louis and Casimir Batthyányi, Kossuth now founded the *Védegylet* (protective union), whose members, men and women, bound themselves for five years to use exclusively home-made productions, whenever these could be had. Other societies, agricultural, commercial, and industrial, were practically to assist the protective union. The latter soon counted its members by hundreds of thousands. Kossuth was the animating spirit of the whole organization, which proved less effective for its direct purpose, the development of home industry, than for keeping alive the national agitation, and most of the practical projects failed. The elections of 1847, coinciding with the movements in Switzerland, Italy, and elsewhere, gave a new turn to affairs. Kossuth was elected for Pesth; and Count Széchenyi, though entitled to a seat in the upper house, had himself elected to the lower for Wiesenburg, in order to oppose him personally. A few sessions sufficed to establish Kossuth as a recognized leader of the house. The uncompromising spirit of the two parties seemed to condemn the diet to inaction, when the news of the Paris revolution of February, 1848,

reached Presburg. In a speech delivered on March 3, Kossuth proposed an address to the emperor Ferdinand, urging the restoration of Hungary to its former independence as a state, and the granting of a charter of liberty for the whole Austrian empire. The house of deputies accepted the propositions; the upper house wavered, but the people of Vienna, taking the matter into their own hands, decided the question on March 13. Metternich fled. Kossuth was received in the capital of the empire, whither he now carried his address, with the honors of a liberator, and Louis Batthyányi was intrusted by Ferdinand with the formation of an independent Hungarian ministry, in which Kossuth received the department of finance. The long urged measures of liberal reform were now carried in an amplified shape, and on April 11, 1848, the last diet of Presburg closed its sessions, to make room for a national assembly in Pesth. Foreseeing the coming struggle, Kossuth devoted all his energies, as the leading spirit of the new government, to the organization and consolidation of its powers. He created a treasury, organized the militia, formed new battalions of national soldiery (*honvéds*), established armories, and roused the spirit of the nation by proclamations, speeches, and articles in his new organ, *Kossuth hírlapja* (edited by Bajza), at the same time neglecting no means of bringing about a peaceful solution of the difficulties. The south of Hungary and Transylvania were already engaged in an internecine struggle of races, in which the Rascians, old enemies of the Magyars, were particularly conspicuous. Reaction was triumphant everywhere, the camarilla was flushed by the victories of Radetzky in Italy, and Jellachich crossed the Drave with a large army to subdue Hungary. Batthyányi resigned, the palatine Stephen fled, and Jellachich was approaching the capital. Kossuth in the mean time had begun his armaments and issued treasury notes without the sanction of the king, and in a proclamation he called upon the people to rise and vindicate their rights. He repaired to the people of the Theiss, who flocked around his banners, and on his return entered upon a new course of activity, as head of the "committee of defence." The war of revolution was thus begun. (See HUNGARY.) It was from beginning to end a struggle for life or death under inauspicious circumstances, and the overwhelming power of Russia, the obstinate disobedience of Görgey, the want and the indifference of the governments of Europe, or rather their connivance with Russia and Austria, finally decided against Hungary, which had been declared independent, and Kossuth its governor. On Aug. 11, 1849, he resigned his powers in favor of Görgey, who two days later surrendered to the Russians. Kossuth sought refuge in Turkey, where he and his followers were confined in Widin, Shumla, and subsequently in Kutaiah in Asia Minor. His extradition was demanded by Austria and Rus-

sia, but though he refused the proposed means of evading all danger by an adoption of the Mohammedan religion, the Porte, encouraged by England and France, resisted all threats; and finally, at the intervention of the United States and England, he was allowed to depart with his family and friends. His wife had secretly escaped from Hungary, and his children, two sons and a daughter, had been allowed by Haynau to join him in Asia. On Sept. 1, 1851, he was liberated and set out to embark on the war steamer *Mississippi*, which had been despatched by the United States government, in accordance with a resolution of the senate, to convey him to America as the nation's guest. He had employed the days of his confinement in Asia in the study of military science, and in perfecting his knowledge of living languages. He was able to address the people of the West in French, English, German, and Italian; and when, after visiting Gibraltar and Lisbon, where he was treated with distinction, he finally reached Southampton, he was listened to with no less admiration than sympathy by the English. The same enthusiastic feeling followed him on his tour through the most populous cities of the kingdom, and subsequently through the United States, where he arrived Dec. 5, 1851, accompanied by his wife and Mr. and Mrs. Pulszky. He addressed deputations and meetings in New York, Philadelphia, Baltimore, Washington, and numerous other places, urging the acknowledgment of the claims of Hungary to independence, and the interference of the United States jointly with England in behalf of the principle of non-intervention, which would allow the nations of Europe fair play in a new struggle for liberty. His agitation received a fatal blow by the *coup d'état* of Louis Napoleon, the news of which reached America a fortnight after his arrival, and his call for contributions for a reopening of the struggle in Hungary had therefore a very small result, in spite of the general sympathy with the exile and his cause. At Washington he was received with distinctions which had never been bestowed on any foreigner except Lafayette. He returned to Europe in July, 1852, where for some time he acted in concert with Mazzini and Ledru-Rollin. Preparations for a rising in the spring of 1853, which rapidly consumed the contributions received in the United States, ended with the execution of Jubal, Noszlopi, and others in Hungary, and with the banishment of Kossuth's mother and sisters. His mother died soon after in Brussels; one of his sisters, Mme. Meszlényi, died some time after her arrival in the United States, and another, Mme. Zulyavsky, in 1860; and the only surviving one, Mme. Ruttkay, still resides there. After some participation in newspaper discussions, Kossuth delivered lectures on various topics, but especially on the history and affairs of Hungary, in England and Scotland. The preparations of Napoleon and Victor Emanuel for a war against Austria at the

beginning of 1859 once more rekindled his hope for the liberation of Hungary. He went to Paris, and subsequently to Italy, where he was received with great enthusiasm by the people, and introduced by Prince Napoleon to the emperor of the French, with whom he concerted a common plan of attacking Austria in its Hungarian possessions in case the war should be carried into the interior of Venetia. This was prevented by the peace of Villafranca. Kossuth, bitterly disappointed, returned to England, and the Hungarian legion, formed under Klapka in Sardinia, was dissolved. In 1862 he removed to Turin, where he has since resided, and where he successively lost his daughter and wife. During the war of 1866 he issued an address to the Hungarians, trying to rouse them to action, and subsequently repeatedly and strongly condemned the arrangement with Austria carried through under the lead of Deák. Declining several elections to the diet of Pesth, he has since remained in voluntary exile, occupied with scientific studies, and has published several papers, among them *Farbenveränderung der Sterne* (1871).—His collected writings have been published in the *Europäische Bibliothek* (Wurzen, 1860-'70). Of his speeches various collections have appeared in England, the United States, and Germany. See W. J. Wyatt, "Hungarian Celebrities" (London, 1872).

**KOSTROMA. I.** A central government of European Russia, bordering on the governments of Vologda, Viatka, Nizhegorod, Vladimir, and



Interior of Church of the Holy Trinity at Kostroma.



Yaroslav; area, 30,812 sq. m.; pop. in 1867, 1,101,099. It is traversed by the Volga, which here receives the Kostroma and the Unzha. It consists of wide plains, little varied by gentle acclivities or river banks. There are numerous lakes, of which the largest, the Galitch and the Tchukhloma, measure about 5 m. across. The northern part is comparatively swampy and cold. Extensive woods abound. The soil is generally fertile. Agriculture, the rearing of cattle and sheep, hunting, and fishing are the chief pursuits of the inhabitants. Cloth, leather, and iron are manufactured to some extent. **II.** A city, capital of the government, on the Volga, 190 m. N. E. of Moscow; pop. in 1867, 23,453. It is one of the most interesting cities of E. Russia, is the seat of a Greek bishop, and has about 40 churches, a number of convents, a gymnasium, a seminary, and a monument of the czar Michael Fedorovitch, the founder of the Romanoff dynasty.

**KOTAH. I.** A native state of India, in Rajpootana, bordering on Boondee, Gwalior, and Indore, and bounded N. W. and W. by the Chumbul; area, about 5,000 sq. m.; pop. about 433,000. The surface is for the most part a plain, sloping gently northward from the high table land of Malwah. The soil is generally fertile and well cultivated, but the climate is very unfavorable, being intensely hot during the prevalence of the warm winds of summer, and extremely unhealthy during the rainy season. The rajah of Kotah is in subsidiary alliance with the British, pays a tribute of 184,720 rupees, and maintains an irregular force commanded by British officers. These troops rose against the British, July 4, 1857, and two regiments of the rajah's native army did the same on Oct. 15. The rajah kept faith with his allies. **II.** A city, capital of the state, on the Chumbul, 195 m. S. W. of Agra. It is a town of considerable size, with several temples, mosques, and palaces, and carries on an important domestic and transit trade. It was the scene of the murder of Major Burton and his two sons, and of the burning and plunder of the British residency, during the mutiny in 1857. The town was captured March 30, 1858.

**KÖTHEN**, a town of Germany, in the duchy of Anhalt, 33 m. N. W. of Leipsic; pop. in 1871, 13,563. It has two Protestant churches, a Catholic church, a synagogue, a palace with a library and collection of natural history and coins, a gymnasium, a normal school, and a school of landscape gardening. The trade in grain, wool, and other products is active, but the principal branch of industry consists in sugar refineries, which surround the town in almost every direction. It is at the junction of the Berlin and Anhalt, Magdeburg and Leipsic, and Köthen and Halberstadt railways. The gambling table which formerly existed at the depot has been abolished.—Köthen was formerly the capital of the duchy of Anhalt-Köthen, long associated with German history as an important branch of the Anhalt dynasty.

Duke Augustus Christian Frederick, who died in 1812, produced by his reckless administration a great financial crisis, which under Duke Henry culminated in 1845 in bankruptcy; and an arrangement had to be made with the creditors, whose claims amounted to upward of 4,000,000 thalers. In 1853 Köthen was united with Dessau, and in 1863 the Anhalt territories were united into one duchy.

**KOTSCHY, Theodor**, a German botanist, born at Ustron, Austrian Silesia, in 1813, died in 1866. He accompanied Russegger to Africa, and subsequently explored Asia Minor, and made another journey to Egypt and Persia; and he was the first to give a complete account of the flora of the Nile. He edited the botanical department of Russegger's description of his travels (7 vols., Stuttgart, 1841-'50), and among his numerous other botanical works are *Die Fischen Europas und des Ostens* (Olmütz, 1858-'62), and the posthumous *Plantæ Tinnæana*, a description of Miss Tinné's collection on the Upper Nile.

**KOTZBUS**, or *Cottbus*, a town of Prussia, in the province of Brandenburg, on the Spree, 43 m. S. S. W. of Frankfort-on-the-Oder; pop. in 1871, 18,916, including many Wends, who have a separate church. It contains two other churches, a gymnasium, and a quaint old royal palace. Cloth and wool are extensively manufactured, besides other articles, and there is a considerable traffic. It is the capital of a large circle which formerly belonged to Lower Lusatia as part of the territory acquired in 1445 by the elector Frederick II. of Brandenburg. The treaty of Tilsit allotted the circle in 1807 to Napoleon, who ceded it to Saxony. In 1813 it was reoccupied by Prussia.

**KOTZEBUE. I. August Friedrich Ferdinand von**, a German dramatist, born in Weimar, May 3, 1761, assassinated in Mannheim, March 23, 1819. He studied at the gymnasium of Weimar and the university of Jena, was admitted an advocate in 1780, made himself known by the publication of two books in 1781, and accompanied the Prussian ambassador to St. Petersburg. Here he was employed as secretary of the governor general, and after his marriage in 1785 with a daughter of Lieut. Gen. Von Essen, he was appointed to a high judicial office in the province of Esthonia, and was ennobled, which afterward led him to write a fulsome work on nobility. His literary reputation was established by several successful novels and dramas, but injured by the publication of *Doctor Bahrdt mit der eisernen Stirn*, in which he attacked the celebrated poets of Weimar (Goethe, Schiller, &c.), who had declined to admit him into their society. After the death of his wife he visited Paris, on which occasion he wrote another ill-mannered book, *Meine Flucht nach Paris* (1790). After his return to Russia, he devoted several years to writing a series of plays till 1798, when he succeeded Alxinger as poet to the court theatre at Vienna. In 1800 he returned to Russia,

where he was arrested on suspicion of having written pamphlets against the emperor Paul, and banished to Siberia. He was indebted for his liberation to one of his plays, *Der Leibkutscher Peters des Grossen*, which presented the emperor in a flattering light, and published *Das merkwürdigste Jahr meines Lebens* (1801), a rather romantic description of his year of exile. He received an estate in Livonia, and was made director of the German theatre in St. Petersburg and imperial councillor. In 1802 he took up his abode in Berlin, where he became a member of the academy of sciences, and one of the editors of *Der Freimüthige*, a literary journal. In 1805 he published an account of travels made in the preceding years in France and Italy; and in 1808-'9 appeared his *Preussens ältere Geschichte*, esteemed only for its collection of authentic historical documents. After 1806 he lived again in Russia, but returned to Germany in 1817 to report to the Russian government on the state of public opinion. He resided alternately at Weimar and Mannheim, and at the same time conducted a weekly journal. When it became known that he was the author of letters to the czar, and of articles in which the secret political associations of the German students (*Burschenschaften*) were held up to scorn and ridicule, a student named Sand went to Mannheim and stabbed Kotzebue in the breast with a dagger, exclaiming, "This is for you, traitor to your country."—Kotzebue was the most fertile writer of plays whom Germany ever produced. Many of them have been translated into English, French, and other languages. Among those best known on the American and English stage are "The Stranger" and "Pizarro," both adapted by Sheridan, the former from Kotzebue's *Menschenhass und Reue*, and the latter from *Die Incas in Peru*. He wrote in all 211 tragedies, comedies, and farces, and some of them retain their popularity. Complete editions of his dramatic works appeared in Leipsic in 1797-1823, in 28 vols., and in 1827-'9, in 44 vols. His most successful novel, written in early life, is *Leiden der Ortenbergischen Familie*. His posthumous writings were published in Leipsic in 1821. An English translation of his autobiography appeared in London in 1800. His German biographers are Cramer (Leipsic, 1819) and Döring (Weimar, 1829). **II. Otto von**, a Russian traveller, son of the preceding, born in Revel in December, 1787, died there in February, 1846. He was educated at the academy of St. Petersburg, and joined Krusenstern as midshipman in a voyage round the world, from which he returned in 1806. He was promoted to the rank of lieutenant, and intrusted in 1815 with the command of the *Rurik*, a vessel equipped at the expense of Count Rumiantzeff. He was joined in this expedition by the poet Chamisso, and by the naturalists Eschscholtz and Choris. After the discovery of various islands, bays, and a sound N. E. of Behring strait since called after him, he returned to Russia, Aug. 3, 1818,

and published an account of his journey, which has been translated into French and English ("A Voyage of Discovery into the South Sea and Behring's Strait in the Years 1815-'18," 3 vols., London, 1821). In 1823 he undertook a third voyage around the world as captain of an imperial man-of-war. Touching at Rio de Janeiro, he doubled Cape Horn, discovered several islands, collected much valuable information on ethnography, natural history, and geography, visited Lower California and the Sandwich islands, and on his way home touched at the Philippine islands, reaching Cronstadt July 10, 1826. In 1829 he retired from active service, and spent the rest of his life with his family in Esthonia. He published a narrative of his voyage, of which an English translation appeared in London in 1830 ("A New Voyage round the World in the Years 1823-'6"). The romantic character of the narrative led several critics to impugn its veracity, although there is no evidence by which the charge can be supported. Eschscholtz enriched the volume with full zoological information. **III. Moritz von**, a Russian soldier, brother of the preceding, born May 11, 1789, died in Warsaw in February, 1861. He sailed with Krusenstern and his brother Otto round the world, entered the Russian army in 1806, was captured by the French in 1812, liberated in 1814, and published in 1815 *Der russische Kriegsgefangene unter den Franzosen*, an account of his adventures. Attached to the Russian embassy, he made a journey to Persia in 1817, of which his father published a description in Weimar in 1819 (English translation, "Narrative of a Journey into Persia in 1817," London, 1819). He served subsequently in the Caucasus, commanded the fortress Ivangorod in Poland, and was made a general in 1846. At the time of his death he was a member of the Polish division of the Russian senate. **IV. Paul**, a Russian soldier, brother of the preceding, born about 1790. He fought with distinction in the Caucasus and in Poland, and was rapidly promoted. In 1862 he became governor general of Bessarabia and South Russia, and commander of Odessa, offices which he still held in 1874, when he was made a count. **V. Alexander von**, a painter, brother of the preceding, born in Königsberg, June 9, 1815. After graduating as an officer in 1834, he studied painting at the academy of St. Petersburg. In Paris (1847-'8) he associated much with Horace Vernet. He afterward lived in Stuttgart, visited Rome, and settled in Munich. He has executed many brilliant pictures of Russian victories for the Winter palace and other galleries.

**KOULI KHAN.** See NADIR SHAH.

**KÖVÁR**, a district of eastern Hungary, bordering on the counties of Mármaros, Szathmár, and Middle Szolnok, and on Transylvania; area, 423 sq. m.; pop. in 1870, 51,744. From 1849 to 1860 the district belonged to the Transylvanian circle of Dées; but in 1860 it was again constituted an independent Hungarian



district. The principal places are Nagy-Somkut, the capital, and Kapnik-Bánya.

**KOVNO** (Pol. *Kowno*). I. A W. government of European Russia, bordering on Prussia and on the governments of Courland, Wilna, and Suwalki, and nearly touching the Baltic; area, 15,687 sq. m.; pop. in 1867, 1,131,248, chiefly Lithuanians, Samogitians, Poles, Germans, and Jews, with but few Russians proper. It is traversed by the Niemen and its affluents, and contains many dense forests. The principal products are flax and timber, the latter being rafted down the streams to Tilsit. It was formed in 1843 from the N. part of Wilna, to the military division of which it still belongs. Kovno is nearly identical with the ancient maritime Lithuanian province of Samogitia (Lith. and Pol. *Żmudź*), which was a separate duchy under the Polish crown, and which was renowned for its commerce and navigation, and for the pure Lithuanian type of the inhabitants, who were not fully converted to Christianity till the 16th century. The capital, Rossieny on the Dubisa, the chief town of a circle of Kovno and Polangen, is now as then the principal port connecting with the Baltic. II. A city, capital of the government, at the junction of the Vilia with the Niemen, 420 m. S. S. W. of St. Petersburg; pop. in 1867, 34,612, including about 18,000 Jews and many Germans. It contains numerous Catholic churches and convents, besides places of worship for the national religion, and for Lutherans and Jews, a gymnasium and district school for the nobility, and a pyramid commemorating the deliverance from French invasion in 1812. Commerce and navigation are exceedingly active, and new railways increase the traffic. About 3 m. from the town is the magnificent Camaldulensian convent Pozayscie or Peace Mountain, with the tomb of the Lithuanian great chancellor Pac, who built it in 1674 at an enormous cost. The French crossed the Niemen at Kovno, June 23-25, 1812; and the Poles were defeated here on June 26, 1831.

**KOZLOV**, a town of Russia, in the government and 40 m. N. N. W. of the city of Tambov, on the Lesnoi Voronezh; pop. in 1867, 24,616. It has nine churches, and large tanneries and tallow-smelting establishments. It is a great centre of trade in grain, cattle, salted meat, tallow, and other articles; and there are in the district about 40 breeding stables of famous horses.

—For Kozlov in the Crimea, see EUPATORIA.

**KRAJOVA**. See KRAYOVA.

**KRAKEN**. See OCTOPUS.

**KRANACH**, Lucas. See CRANACH.

**KRASICKI**, Ignacy, a Polish prelate, surnamed the Voltaire of Poland, born at Dubiecko, Galicia, Feb. 3, 1734, died in Berlin, March 14, 1801. His ancestors had been renowned as scholars and warriors. He completed his ecclesiastical studies in Rome, and after having been a canon and curate he was promoted in 1767 to the see of Ermeland; this was annexed

to Prussia in 1772, and he became a favorite of Frederick the Great. The Roman Catholic Hedwigskirche was built in Berlin under his influence, and he consecrated it in 1780. In 1795 he was made archbishop of Gnesen, to which town his remains were removed in 1829 from their first burial place in the Hedwigskirche. His *Myszeis* ("Mousiad"), a comic poem illustrating the story in Kadlubek's chronicle of King Popiel devoured by rats and mice (Warsaw, 1775; Leipsic, 1790), and his "Adventures of Doswiadczynski" (1775), suggesting educational reforms, have been translated into French. His *Monomachia* ("War of Monks," 1778) has been compared to the writings of Boileau, and was at the request of Frederick composed in the room which Voltaire had occupied at Sans-Souci. His *Anti-Monomachia* is a vindication and not a refutation of the previous work. Among his most admired productions are his "Satires" (1778) and his "Fables," which latter are unique, though not all original, and have been repeatedly translated into French. His *Wojna chocimska* ("War of Khotin," 1780) is a historical epic; and his *Pan Podstoli* ("Mr. Sub-Chamberlain") satirizes the follies and vagaries of his countrymen. He also made an exquisite free translation into Polish of Ossian (1780). His complete works were edited by Dómchowski (10 vols., Warsaw, 1803-'4; new eds., Paris, 1830, and Berlin, 1845).

**KRASINSKI**. I. Waleryan, count, a Polish author, born in the Polish province of White Russia about 1780, died in Edinburgh, Dec. 22, 1855. He entered the Polish civil service at an early age, and while still a young man became head of the ministry of public instruction. In this post he effected many useful reforms. Through his influence the Jews were aided in founding a rabbinical college at Warsaw. He paid special attention to the diffusion of useful literature among the people, and introduced stereotype printing into Poland. On the breaking out of the revolution of 1830 he was sent as one of an embassy to England to advance the Polish cause. Driven into exile, and losing his fortune by the result of the war, he went to London, and for the remainder of his life devoted himself to literature. He published "The Rise, Progress, and Decline of the Reformation in Poland" (2 vols., London, 1839-'40); "Panславism and Germanism" (1848); "Lectures on the Religious History of the Slavonian Nations" (Edinburgh, 1851); and "Montenegro and the Slavonians in Turkey" (1853). II. Zygmunt Napoleon, count, a Polish author, descended from a branch of the same family with the preceding, born in Paris, Feb. 19, 1812, died there, Feb. 24, 1859. He was the son of Count Wyncenty Krasinski, who succeeded Poniatowski in the command of Napoleon's Polish cavalry, and afterward entered the service of Russia. Here the favor which the court extended to him would have been continued to his son, had not young Krasinski,

indignant at the treatment of his Polish countrymen, and warmly espousing their cause, refused all offers of advancement in the Russian service, and left the country soon after attaining his majority. From this time he led a somewhat wandering life, residing successively in several European capitals, and devoting himself to literary pursuits, at first publishing anonymously, and afterward under his own name. His principal works, nearly all of which were inspired by strong patriotic feeling, and were undertaken in the interest of the Polish cause, are: *Nieboska komedya* ("The Undivine Comedy," in three parts, Paris, 1837-'48); *Irydion*, an imaginative poem in German on the sufferings and future of the Slavic race (Berlin, 1845); *Noc letnia* ("The Summer Night"), *Pokusa* ("The Temptation"), a collection of lyrics under the title *Przedświt* ("Before Dawn"), and *Psalmy przyszłości* ("Psalms of the Future," 5th ed., Paris, 1861). An edition of Krasinski's collected works appeared at Leipsic (3 vols., 1863), as one of the series called *Biblioteka pisarzy polskich* ("Library of Polish Authors"). Owen Meredith's "Fool of Time" is confessedly founded upon Krasinski's *Nieboska komedya*; and the question whether the English poet was entirely justified in the use made of the material has given rise to some discussion. Besides French and German translations, an English rendering of the *Komedya*, made through a German version, was published by Mrs. Martha Walker Cook in the "Continental Magazine" (New York, 1864).

**KRASSÓ**, a S. county of Hungary, in the circle beyond the Theiss, bounded N. by the Maros, and E. by Transylvania; area, 2,019 sq. m.; pop. in 1870, 259,079, the majority of whom were Roumans and the remainder Germans, Croats, and Magyars. It abounds in rich pasturage, forests, and mines. The principal places are the county town Lugos, and the market town Krassó or Krassova, from which the county has its name.

**KRASZEWSKI, Józef Ignacy**, a Polish author, of Lithuanian origin, born in Warsaw in 1812. He studied at the university of Wilna, and was under arrest from 1831 to 1834 on account of his revolutionary sympathies. In 1837 he married a daughter of the archbishop and author Woronicz, and settled in Volhynia, where he was honorary curator of schools from 1853 to 1858, when he went abroad. In 1860 he established himself in Warsaw as editor of the *Gazeta polska*, and in 1863 he removed to Dresden, where he subsequently delivered lectures. He edited the "Polish Athenæum," a literary periodical (18 vols., 1842-'8), and his *Studia literackie* ("Literary Essays," 1842), and *Nowe studia literackie* (2 vols., 1843), throw much light on letters and science. His principal historical works are *Wilno* (4 vols., 1840-'42), and *Litwa* (2 vols., 1847-'50), relating to Lithuanian manners and social life. Conspicuous among his

poetical writings is *Anafielas* (3 vols., 1840-'43), taking its theme from the most impressive events in the early history of Lithuania. He has also published books of travel, miscellaneous writings, and sketches of the insurrection of 1863. His complete works comprise more than 300 volumes, including many novels and stories descriptive of Polish life, which are his most popular productions.

**KRASZNA. I.** An E. county of Hungary, in the circle beyond the Theiss, bounded S. E. by Transylvania; area, 444 sq. m.; pop. in 1870, 62,714, most of whom are Roumans. It is mostly mountainous, and only in the valleys suited for agriculture. Before 1860 this county belonged to Transylvania. Capital, Szilágy-Somlyó. **II.** A market town, on the Kraszna, 5 m. S. E. of Szilágy-Somlyó; pop. in 1870, 3,128. The inhabitants, partly Magyars and partly Roumans, trade in cattle.

**KRAUSE, Karl Christian Friedrich**, a German philosopher, born in Eisenberg, May 6, 1781, died in Munich, Sept. 27, 1832. He was educated at Jena, where he was tutor from 1802 to 1804. He then renounced teaching to devote himself to his philosophical studies, and resided successively in Rudolstadt, Dresden, and Berlin, made several journeys through Germany, France, and Italy, and lectured at Göttingen from 1824 to 1831, when he retired to Munich. The aim of his speculations was to represent humanity as an organic and harmonious unity; and he conceived the scheme of an association of all mankind, which should labor for a uniform and universal development. The germ of such a union he thought he found in freemasonry. His works include *Vorlesungen über das System der Philosophie* (Göttingen, 1828; new ed., Leipsic, 1874), and *Vorlesungen über die Grundwahrheiten der Wissenschaft* (Göttingen, 1829).

**KRAUTH, Charles Porterfield**, an American theologian, born in Martinsburg, Va., March 17, 1823. He is the son of the Rev. Charles Philip Krauth, former president of Pennsylvania college, Gettysburg. He graduated there in 1839, entered the Lutheran ministry in 1841, and was pastor successively of churches in Baltimore, Md., Winchester, Va., and Pittsburgh, Pa. In 1852-'3 he visited the Danish West Indies, and for three months of that time, during the severe prevalence of the yellow fever, preached in the Dutch Reformed church in St. Thomas. A sketch of his tropical experiences was published afterward under the title "A Winter and Spring in the Danish West Indies." He was pastor of St. Mark's Lutheran church in Philadelphia from 1859 to 1864, and in 1861 became editor of the "Lutheran and Missionary." In 1864 he was elected professor of systematic theology and church polity in the Lutheran theological seminary in Philadelphia, and in 1868 of intellectual and moral philosophy in the university of Pennsylvania, of which he was elected vice provost in 1873. He has been for three

successive terms president of the general council of the Lutheran church in America. He has been among the most active laborers in the liturgical movements of his church, edited "The Jubilee Service," and bore a prominent part in the preparation of the "Church Book," set forth by authority of the general council in 1869. He has gathered a large and valuable library, and has become distinguished as a Biblical and historical writer. He is a member of the oriental and philosophical societies, the historical society of Pennsylvania, and the American committee coöperating with the British committee in revising the authorized version of the Scriptures. His chief distinction as an author is due to a work entitled "The Conservative Reformation and its Theology" (8vo., Philadelphia, 1871). He has also published "Three Essays on Poverty," and a number of special discourses and of dissertations in explanation and defence of the Augsburg confession, and has contributed largely to theological and literary periodicals, especially upon the internal history and relations of the authorized version of the Scriptures. He has translated Tholuck's commentary on John (1859), and Ulrici's review of Strauss (1874); and has edited Fleming's "Vocabulary of Philosophy," with an introduction and syncretical and bibliographical indexes (2d ed., 1860), and Berkeley's "Principles of Knowledge," with extended prolegomena, Ueberweg's notes, and a large amount of original annotation (1874).

**KRAYOVA**, or *Krajova*, a town of Roumania, capital of Little Wallachia, near the river Shyl, 113 m. W. of Bucharest; pop. in 1867, 21,521. It is a fine town, containing several churches, a court of appeal, a gymnasium, a normal and a Lancasterian school, and a public park. It has a considerable commerce, and in the vicinity are salt works. Sultan Bajazet was defeated here in 1397 by the Wallachian waywode Mirxa. The Russians occupied the town in 1853, and had several skirmishes with the Turks, who regained possession in May, 1854.

**KREMENTCHUG**, a town of European Russia, in the government and 60 m. S. S. W. of the city of Poltava, at the entrance of the Kagamlyk into the Dnieper, over which a long bridge has been built; pop. in 1867, 20,251. It has seven churches, numerous factories of gold and silver ware, and is the most important commercial town of the government.

**KREMLIN**. See Moscow.

**KREMNITZ** (Hun. *Körmöcz-Bánya*, the latter word meaning mine), the principal mining town and a free royal city of Hungary, in the county of Bars, 82 m. N. of Pesth; pop. in 1870, 8,442. It is situated in a deep valley, surrounded by rugged hills and mountains, has several suburbs, a mint, various mining establishments, smelting and washing works, a vitriol factory, paper mills, and other manufactories, and contains the principal offices of the surrounding gold and silver mining region.

An aqueduct supplies it with water. Its mines consist of about a dozen principal and various minor shafts, the produce of which has greatly decreased in recent times. The Austrian ducats are coined in Kremnitz. The town was founded in the 12th century by German emigrants, whose descendants form the present population. It has a castle, a Catholic gymnasium, six churches, and a hospital for miners.

**KREMS**, a town of Austria, in the crown-land of Lower Austria, at the entrance of the river Krems into the Danube, 38 m. W. N. W. of Vienna; pop. in 1870, 6,114. It has four churches, a college of the Piarists, a gymnasium, a military school, and manufactories of silk, velvet, and steel ware.

**KREMSIER**, a town of Moravia, 20 m. S. S. E. of Olmütz, on the March or Morawa, over which there is a chain bridge 70 ft. long; pop. in 1870, 9,823. It is the summer residence of the archbishop of Olmütz, has three churches, a castle with a picture gallery, library, and museum of natural history, a monastery of the Piarists, a gymnasium, and a military institution. From Nov. 15, 1848, to March 7, 1849, the Austrian Reichstag was assembled here.

**KREUZNACH**. See CREUZNACH.

**KRILOFF**. See KRYLOFF.

**KRISHNA**. See INDIA, RELIGIONS AND RELIGIOUS LITERATURE OF.

**KRISHNA**, a river of India. See KISTNAH.

**KRONSTADT**, a seaport of Russia. See CRONSTADT.

**KRONSTADT** (Hun. *Brassó*), a city in the Saxon division of Transylvania, Transleithan Austria, near the frontier of Wallachia, 65 m. E. S. E. of Hermannstadt; pop. in 1870, 27,766, of whom about 10,000 were Germans, 9,000 Roumans, 4,000 Magyars, and the remainder chiefly Jews and gypsies. It is the largest and most flourishing town in Transylvania, situated in a narrow valley enclosed by mountains. Charming villas on the slopes, with here and there an old castle on the heights, give a varied and picturesque aspect to the surrounding scenery. It consists of an inner town, which is encircled by a wall and entered by five gates, and three suburbs, of which one, called the upper town or *Bolgár*, extends into the mountain passes, winds up the slopes, covering them with beautiful country mansions and well kept gardens and orchards, and is the favorite residence of the wealthy Roumans. The principal streets of the inner town are well paved and clean, and the houses generally well built. It has a large market place, with two fountains, and at the main gate an esplanade covered with avenues of shady trees. There are three gymnasia, several other schools, a chamber of commerce, and military hospital. Kronstadt has iron and copper works, paper mills, manufactures of woollen, linen, and leather, and carries on a brisk trade in the products of the region.—The foundation of Kronstadt is traced back to the early part of the 13th century. In the 16th it was the starting point of the reformation in

Transylvania, which was promoted by Honterus, a disciple of Melancthon, who is said to have been in intimate correspondence with Luther, and to have also established the earliest printing press here (1533), its first productions being the Augsburg Confession and Luther's writings. Here, too, the first paper mill was erected. Kronstadt was formerly surrounded by strong fortifications, which are now in ruins. Northeast of the town is a small citadel, situated on the summit of an isolated hill, which was not without importance in the Hungarian war of 1848-'9.

**KROO**, or **Kru**, a negro race on the W. coast of Africa, whose territory extends from Cape Mesurado, on the right shore of the river St. Paul, to St. Andreas, a district generally known as the Pepper coast. According to a legend current among the Mandingos and Foolahs, the Kroos were driven by them out of the interior of central Africa. Their neighbors, the Akevom, who extend as far as the river Assinie, are supposed to be ethnologically closely related to them. They are the so-called Kroomen, who are employed as sailors, boatmen, storemen, and sometimes as mechanics, and in whom a traffic is carried on by the factors and shipmasters on the coast. (See LIBERIA.)

**KROTOSCHIN** (Pol. *Krotoszyn*), a town of Prussia, capital of a circle, in the province and 52 m. S. E. of the city of Posen; pop. in 1871, 7,866, including over 2,000 Jews. It contains places of worship for Roman Catholics, Protestants, and Jews, and gives title to a mediatised principality which was conferred in 1819 upon Prince Thurn and Taxis, on the relinquishment of a portion of his postal monopoly. The trade in wool is considerable, and cloth, chicory, tobacco, and other articles are manufactured here.

**KROZET**, or **Crozet**, a group of four small islands in the Indian ocean, between Kerguelen and Prince Edward islands, of volcanic origin, and composed chiefly of large rocks. Possession island, the largest of the four, is 20 m. long and 10 m. broad, with three bays, of which America bay is most frequented by sealers, who subsist on albatross eggs and the flesh of the young albatross, on wild ducks, goats' flesh, and the tongue and flippers of the sea elephant. It contains some patches of land, and as the temperature is rarely very low, it is believed that potatoes and vegetables would thrive. Penguin or Inaccessible island, a mere rock, derives its names from its inaccessibility, and from the abundance of penguins. Pigs' island, the most western of the group, which is less desolate, was so named from the pigs left there in 1834, which have increased to such an extent that they overrun the whole island, and afford abundant food for the sailors. The most eastern, in lat. 47° S., lon. 48° E., is known as East island, and is about 1 m. in diameter and 4,000 ft. high, with precipices rising in some places perpendicularly from its shores. The Krozet islands were select-

ed in 1874 as an American and British station for the observation of the transit of Venus.

**KRÜDENER**, **Juliane de Vietinghoff**, baroness, a Russian novelist and mystic, born in Riga, Nov. 21, 1764, died in Karasu-Bazar, Crimea, Dec. 25, 1824. She was carefully educated in the house of her father, Baron Vietinghoff, one of the wealthiest proprietors in Livonia, and was early remarkable for intelligence and for a tendency to revery and melancholy. In 1777 she visited Paris with her parents, and on her return at the age of 18 was married to a Russian diplomatist, Baron Krüdener, whom in 1784 she accompanied to Venice and other cities of Italy, and afterward to Copenhagen and Paris; and in 1791 she made a journey through the south of France. Of a singularly naive and romantic character, she was guilty of numerous indiscretions, which led to a separation from her husband in 1791. After an adventurous life, with a reputation for beauty and wit, in various cities of Europe, she went to Paris in 1803 with literary schemes. Her romance *Valérie* appeared in that year, marked by a vague melancholy and light and graceful style, which, with the support of her friends, secured it a brilliant success. Returning to Riga, and remaining for a time in retirement, she resolved to change her manner of life, and to devote herself solely to the conversion of sinners and the consolation of the wretched. In this pious design she was confirmed by travelling in Germany, by correspondence with the Moravian Brethren, and by an acquaintance with the theosophist Jung-Stilling. Her correspondence for several years abounds in mystical effusions, more elegant though less profound than those of Mme. Guyon, and reveals her double tendency to illuminism and to worldly frivolity. At Paris in 1814 she held religious assemblies in her house, which were frequented by the most important personages. Her spiritual exaltation assumed the character of prevision, and in a letter she foretold in vague terms the escape of Napoleon from Elba, his triumphant return to Paris, and the second exile of the Bourbons. This letter was communicated to the emperor Alexander of Russia, in whom it awakened great interest toward her, and whom she met at Heilbronn in May, 1815, and accompanied to Heidelberg, the headquarters of the allies, and after the battle of Waterloo to Paris. She was present at the grand review of the Russian army in the plain of Châlons, which she described under the title of the *Camp des vertus* (1815). The articles of the holy alliance are said to have been submitted to her revision. Her doctrines, agreeing with the forms of no Christian communion, caused several of the German states to forbid her residence in them. She passed the latter part of her life among the poor and the sick, manifesting an unwearying ardor, and joyously sacrificing herself for the solace of the wretched. In 1818 she returned to Russia, where the emperor continued his

interest in her romantic views, but forbade her to preach publicly. She lost his favor, and was ordered to leave St. Petersburg, when, in her enthusiasm for the cause of the Greeks, she divulged some of his communications on the policy of the czars in the East. Her health was suffering from ascetic rigors, when early in 1824 she joined the princess Gallitzin in the scheme of founding a colony in the Crimea, which was to consist of her disciples. She arrived at Karasu-Bazar, the site selected, in September of that year, and was busy in preaching in French and German to the astonished inhabitants, till after a few months the malady which had afflicted her before her arrival caused her death. The sincerity of Mme. de Krüdener in her mysticism and her apostolic labors has not been questioned.—See Eynard, *Vie de Mme. de Krüdener* (Paris, 1849), and *Frau von Krüdener, ein Zeitgemälde* (Bern, 1868).

**KRUG, Wilhelm Traugott**, a German philosopher, born at Radis, June 22, 1770, died in Leipsic, Jan. 13, 1842. He was educated at the university of Wittenberg, where in 1794 he became adjunct of the philosophical faculty. His *Ueber die Perfectibilität der geoffenbarten Religion* (Jena and Leipsic, 1795) was the cause of his not receiving a professorship, and was followed by other works, chiefly in development of the Kantian philosophy, of which he was one of the most efficient promulgators. He was appointed professor of philosophy at Frankfort-on-the-Oder in 1801, and published in 1803 his principal work, *Fundamentalphilosophie*, in which he proposed a system under the name of "transcendental synthetism," which, as he maintained, reconciled idealism and realism. In 1804 he succeeded Kant as professor of logic and metaphysics at Königsberg, and in 1807 also Kraus as professor of practical philosophy. In 1809 he accepted a professorship of philosophy at Leipsic, which he held till 1834, when he received a pension from the state. He was one of the presidents of the democratic society founded at Königsberg after the peace of Tilsit under the name of the *Tugendbund*; joined in 1813 the Saxon corps of *chasseurs à cheval*; and was afterward a leading champion of German liberalism against Ancillon, Kotzebue, and others. Among his more important works are *Allgemeines Handwörterbuch der philosophischen Wissenschaften* (4 vols., Leipsic, 1827-'8), and an autobiography entitled *Meine Lebensreise in sechs Stationen, von Urceus* (Leipsic, 1826), to which he added a supplementary volume entitled *Leipziger Freuden und Leiden im Jahre 1830* (Leipsic, 1831).

**KRUMMACHER. I. Friedrich Adolf**, a German theologian, born at Tecklenburg, Westphalia, July 13, 1768, died in Bremen, April 14, 1845. His first appointment was to the professorship of theology in the university of Duisburg. He next became pastor of the Reformed church at Crefeld, and afterward exchanged that cure for the rural living of Kettwich. In 1819 he

was called to Bernburg, where he became councillor of the consistory and chief pastor, and in 1824 became pastor of St. Anschaire in Bremen. He was a voluminous writer, both in prose and poetry. His principal works are: "Cornelius the Centurion," "Life of St. John" (both translated into English, Edinburgh, 1840); "The Sufferings, Death, and Resurrection of Christ;" *Die Kinderwelt*, a series of sacred poems for the young; and "On the Spirit and Form of Evangelical History in its Historical and Æsthetical Relations." He is best known, however, by his fables or *Parabeln*, which appeared in 1805, and passed through many editions. They have been translated into English, and added in 1858 to Bohn's "Illustrated Library," with 40 illustrations. His life has been written by Möller (*Friedrich Adolf Krummacher und seine Freunde*, 2 vols., Bonn, 1849). **II. Gottfried Daniel**, brother of the preceding, born in Tecklenburg, April 1, 1774, died in Elberfeld, Jan. 30, 1837. He was educated at Duisburg, and afterward became a popular preacher at Bärth and Wolfrath. In 1816 he was made pastor of the Reformed church at Elberfeld, and was recognized as the head of the pietists in that district. Among his most important works are *Die evangelische Heiligung* (Elberfeld, 1832), and *Tägliches Manna*, or "Daily Manna" (1838). **III. Friedrich Wilhelm**, son of Friedrich Adolf, born in Duisburg in 1796, died in Potsdam, Dec. 10, 1868. He was a minister of the Reformed church, but a strenuous opponent of the rationalistic school of theologians. In 1843 he declined an invitation to a theological professorship at Mercersburg, Pa. In 1853 he was appointed chaplain of the Prussian court at Potsdam. He was regarded as one of the most eloquent preachers in Germany. Among his numerous works, most of which have been translated into English, are "Elijah the Tishbite," "The Last Days of Elisha," "Solomon and the Shulamite," "Sermons on the Canticles," and "Glimpses into the Kingdom of Grace." In 1856 appeared in Berlin his *Bunsen und Stahl*. Among his later devotional works are *Gottes Wort* (Berlin, 1865), and *David der König von Israel* (1866; English translation, 1870). His sermons were collected and published in Berlin in 1868. Soon after his death his daughter edited and published his autobiography, which has been translated into English (2d ed., London, 1871).

**KRUPP, Alfred**, a German manufacturer, born at Essen, Rhenish Prussia, early in the present century. He succeeded his father, Friedrich Krupp, as proprietor of the cast-steel works at Essen, and sent to the London exhibition of 1851 a crucible block weighing 2½ tons, and to the Paris exhibition of 1867 one of 40 tons. He gradually developed the Essen works, which were originally established in 1810, to an enormous extent. They covered in 1873 an area of 965 acres, and produced more than 125,000 tons of cast steel, be-



sides great quantities of finished articles. The works are connected with the main Rhenish railway lines, and contain more than 30 m. of rail tracks to facilitate the traffic, and there are 30 telegraph stations in the establishment. About 12,000 men are employed here, besides 5,000 in the mines and smelting works, and others in other departments, making a total of about 20,000. Krupp has built for his officers and men good dwelling houses and hospitals. A sick, burial, and pension fund had an income in 1873 of \$80,000, and the expenditures amounted to about \$60,000. Another fund secures free medical attendance upon an annual payment of 75 cents. The works at Essen in 1874 included 1,100 smelting and other furnaces, 275 coke ovens, 264 smiths' forges, 300 steam boilers, 71 steam hammers, including a monster hammer similar to Nasmyth's, 286 steam engines with an aggregate of 10,000 horse power, 1,056 machine tools, a chemical laboratory, and photographic, lithographic, and printing and bookbinding establishments. A fire brigade of 70 men acts also as a police force, besides 166 watchmen. The consumption of coal in 1872 was 500,000 tons; coke, 125,000 tons; gas, 155,000,000 cubic feet, for 16,500 burners. The articles manufactured include guns, gun carriages, shot, boiler plates, rolls, spring steel, machinery, axles, wheels, rails, and springs for railways and mines, and shafts for steamers. Krupp was the first to introduce unwelded cast-steel tires for use on railways. He owns extensive coal and iron mines in various parts of Germany, besides having concessions of iron mines in Spain. His smelting works, chiefly on the Rhine, contain nearly 300 coke ovens, and annually produce 120,000 tons of pig iron. He accepted the title of privy commercial councillor, but in 1864 declined patents of nobility. To the Vienna exhibition of 1873 he sent remarkable specimens, comprising siege guns and other pieces of artillery, and ammunition. In 1874 he received so many orders from various governments that he negotiated a loan of 12,000,000 thalers for the extension of his works.

**KRUSENSTERN, Adam Johann von**, a Russian navigator, born at Haggud, Esthonia, Nov. 19, 1770, died in Esthonia, Aug. 24, 1846. From 1793 to 1799 he was in the English service. During the reign of Alexander I. he was made a captain in the Russian navy, and placed in command of a scientific and commercial expedition planned by himself, which sailed from Cronstadt in the summer of 1803, to explore the north Pacific coasts of America and Asia. It was described by Espenburgh, Lisianskoi, Langsdorff, Tilesius, and in part by Krusenstern himself, in his *Reise um die Welt in den Jahren 1803-6* (3 vols., St. Petersburg, 1810-12), which has been translated into many languages (English translation by Hoppner, London, 1813; French, 1821). He was made curator of the university of Dorpat in 1824, vice admiral in 1829, and admiral in 1841.

**KRYLOFF, or Krloff, Ivan**, a Russian author, born in Moscow, Feb. 13, 1768, died in St. Petersburg, Nov. 21, 1844. While a boy he wrote several comedies, and having obtained a place as clerk in one of the public offices, he devoted his leisure to study. In 1801, having been recommended to the empress Maria, he became secretary to Prince Gallitzin. This office, however, was purely honorary, and he spent several years at the country house of the prince, engaged in literary labors. In 1812 he received an appointment in the imperial library, and in 1830 he was made councillor of state. He wrote plays, and contributed to various journals and periodicals, but was most successful in writing fables in imitation of those of La Fontaine. They were collected and published in numerous editions of various styles, cheap and expensive, and are as common in Russian households as the "Pilgrim's Progress" is in England. They were translated into French by several of his friends (Paris, 1825), and have been translated repeatedly into several modern languages. The best translation in French is by Einerling (Paris, 1845); in English, by Ralston (London, 1871); and in German, by Löwe (Leipzig, 1874).

**KUBAN**, a territory of European Russia, in Ciscaucasia, and in the lieutenantancy of Caucasia; area, 36,251 sq. m.; pop. in 1871, 672,224, including nearly 100,000 Mohammedans, the rest being chiefly members of the national church. It is the most populous and extensive region of Ciscaucasia, comprising the territories of the Cossacks in the district (*oblast*) of Kuban (pop. over 300,000) and in their Transkuban districts (pop. over 100,000), besides various tracts of land inhabited by different tribes and some almost desert regions on the Black sea. It is divided into several circles, and contains small towns. The Cossacks are under the authority of a lieutenant general. Capital, Yekaterinodar. (See CAUCASUS.) The principal river is the Kuban, which rises in Circassia at the foot of Mount Elbruz, and after a N., N. W., and W. course of about 500 m. falls into a bay of the Black sea. It has a number of small tributaries, and is navigable only for the smallest craft.

**KUBLAI KHAN**, called in Chinese SHE-TSU and HU-PE-LI, the founder of the 20th or Mongol dynasty of Chinese emperors, born in the earlier part of the 13th century, died in Peking in 1294. He was the grandson of Genghis Khan, under whom the conquest of China had been commenced. A branch of the great Tartar family, known in Chinese history as the oriental Tartars, had harassed the feeble and debauched princes of the Sung dynasty, then governing the principal provinces of China, to such an extent that Li-sung, the reigning emperor about 1250, called in the western Tartars, of whom Kublai Khan was sovereign, to drive out the oriental invaders. This effected, Kublai Khan established himself in China, and in 1260 assumed the title of emperor of that country. The Sung dynasty, though unable to



make any effective resistance, continued to maintain a nominal existence till 1279, when it was extinguished. Kublai Khan now entered vigorously upon the administration of his empire. Assisted by three wise ministers, Yao-tchu, Hing-heng, and Teou-mo, he reformed the army and the administration of civil affairs, reorganized the tribunals of mathematics and astronomy, and called to his court men of letters from all countries, among them the Venetian merchant Marco Polo. He organized an expedition for the conquest of Japan, but a part of his fleet was overwhelmed by a violent tempest, and the remainder destroyed by the Japanese. The discontent of the nobles and the people at this untoward result admonished the emperor to seek conquests in directions where they might be more easily won, and he subjected to his sway Tonquin and Cochin China, and reigned as emperor from the Arctic sea to the straits of Malacca, and from the Yellow sea to the Euxine. He seems to have been, for his time and his country, a ruler of extraordinary ability and integrity.

**KUENLUN**, or **Kulkun**, a mountain range of central Asia, forming the N. boundary of Thibet, and separating it from East Turkistan, the desert of Gobi, and the Koko-nor territory. It runs from W. to E. on or near the parallel of 36° N., until near lon. 92° E. it is broken by the irregular mountain groups around Lake Koko-nor. The Nan-shan and Kilian-shan ranges may be considered as its eastern prolongations. At the W. end it is connected with the Hindoo Koosh, near its union with which it is attached on the north to the Belur Tagh, a great chain running N. and S. along the E. frontier of Independent Tartary. The Karakorum range, with which the Kuenlun is often said to be linked, is really a distinct branch of the Himalaya. The loftiest summits attain a height of 22,000 ft. The mountain of Shinkhieu in the Kuenlun chain is remarkable for a cavern emitting continual flames which diffuse for some distance an agreeable odor, probably from naphtha; it is not a volcano, but a fire spring. The highest watershed, according to the brothers Schlagintweit, who crossed the Kuenlun in 1856, is near the Karakorum pass, the elevation of which is 18,345 ft. The rivers Yarkand and Karakash take their rise near this pass.

**KUGLER, Franz Theodor**, a German author, born in Stettin, Jan. 19, 1808, died in Berlin, March 18, 1858. His *Skizzenbuch* (1830) contained original compositions in poetry, music, and linear design, and in 1833 he published with Reinick a *Liederbuch für deutsche Künstler*. The history of mediæval art, however, occupied him chiefly, and after a visit to Italy for the purpose of collecting materials, he published in 1837 his *Handbuch der Geschichte der Malerei von Konstantin dem Grossen bis auf die neuere Zeit* (2 vols.), the most comprehensive treatise on the subject which has yet appeared. The approbation with which

the work was received caused it to be almost immediately translated into the leading languages of Europe. In England it appeared in three separate parts, of which that relating to the Italian schools was translated by Lady Eastlake, with notes by Sir Charles Eastlake; and those comprehending the German, Dutch, and Flemish schools, and the French and Spanish schools, were edited by Sir E. W. Head. Kugler also published works on "The Polychromy of Greek Architecture and Sculpture, and its Limits," the "Art Treasures in Berlin and Potsdam," "History of Architecture," "Schinkel, the Influence of his Theories of Art," &c. He was almost equally industrious in other walks of literature, having published a "History of Frederick the Great," illustrated by Menzel, a "Modern History of Prussia," a volume of poems, and several successful dramas. From the year 1833 he was professor of the history of art in the royal academy of Berlin, and for 20 years lectured in the university of Frederick William.

**KUHN, Adalbert**, a German philologist, born at Königsberg, Brandenburg, Nov. 19, 1812. He studied in Berlin under Bopp, Böckh, and Lachmann, and became in 1841 teacher and in 1856 professor at the gymnasium of Cologne. He acquired celebrity in comparative philology and as the founder of the science of comparative Indo-Germanic mythology. His principal works are: *Zur ältesten Geschichte der indogermanischen Völker* (Berlin, 1845; enlarged in Weber's *Indische Studien*, Berlin, 1850); *Die Herabkunft des Feuers und des Göttertranks* (1859); and *Sagen, Gebräuche und Märchen aus Westphalen* (2 vols., Leipsic, 1859). He is the editor of a periodical devoted to the comparative philology of the French, Greek, and Latin, and edits with Schleicher a similar publication relating to the East-Aryan, Celtic, and Slavic languages. He has written numerous essays for these periodicals, and many on German mythology and legends in other regions.

**KÜHNE, Gustav**, a German novelist, born in Magdeburg, Dec. 27, 1806. He graduated as doctor of philosophy in Berlin, and has published several novels, of which his *Klosternovellen* (Leipsic, 1838) and *Die Rebellen von Irland* (1840) are the best. His *Deutsche Männer und Frauen* (Leipsic, 1851) is one of his most popular works. He has since published *Skizzen deutscher Städte und Landschaften*, and a novel entitled *Missionär und Proselyt*. He belongs to the "Young Germany" school of politicians and writers, and has done much to promote the establishment of kindergartens after the plan of Froebel, and published on the subject *Fröbel's Tod und der Fortbestand seiner Lehre* (Liebenstein, 1852). He purchased from Lewald the magazine *Europa* in 1846, and continued it till 1859. In 1852 he removed to Dresden. His recent publications comprise *Mein Tagebuch in bewegter Zeit* (Leipsic, 1863), and a collection of his works (7 vols., 1862-'6).

**KÜHNER, Raphael**, a German philologist, born in Gotha, March 22, 1802. He studied in Göttingen, and became in 1824 teacher of Latin and Greek at the lyceum of Hanover. His Greek and Latin grammars and translations have become text books in German, English, American, and Scandinavian schools. The principal of them are: *Ausführliche Grammatik der griechischen Sprache* (2 vols., Hanover, 1834-'5; latest ed., 1869-'71); *Kurzgefasste Schulgrammatik* (1836; 25th ed., 1869); *Elementargrammatik* (1837; 29th ed., 1868); and similar works relating to Latin.

**KUKOLNIK, Nestor**, a Russian author, born in 1808. He was employed in the civil service, and retired with the title of actual councillor of state. He became known in 1833 by his drama "Torquato Tasso," and in 1840 by a tragedy with choruses for which Glinka composed the music. His tragedy "Patkul" was favorably received in 1846, and the Crimean war suggested to him two plays, the "Naval Festival of Sebastopol" and the "Siege of Azov." He has also written many historical novels and stories, one of the most recent of which, "The Two Sisters" (St. Petersburg, 1865), relates to the Polish insurrection.

**KULJA. I.** A province of the Russian government general of Turkistan, in central Asia; area, 27,500 sq. m.; pop. in 1871, 114,337. After the expulsion of the Chinese from the basin of the Ili, this region was for a time ruled by the sultan of the Taranji, who resided in the town of Kulja. Hostile demonstrations of the sultan against the Russian frontier led, in May, 1871, to a Russian expedition, which on July 3 ended with the submission of the sultan. The country was organized as a Russian province, and provisionally divided into four circles. **II.** A town, also called Ili, capital of the province, formerly the capital of Dzungaria, the northwesternmost dependency of China, but since 1871 occupied by and annexed to Russia; pop. about 30,000. It is situated on the Ili, about 350 m. E. of its mouth in Lake Balkash, and has long been one of the centres of the transit trade of central Asia.

**KULM** (Boh. *Chlumec*), a village of Bohemia, in the circle of Leitmeritz, 8 m. N. E. of Teplitz, noted for a battle between the allies and the French, Aug. 29-30, 1813. After his victory at Dresden (Aug. 27) Napoleon was marching upon Silesia, when Schwarzenberg's advance from Bohemia made him retrace his steps, and he despatched Vandamme with 30,000 men to frustrate the enemy's design. Schwarzenberg was obliged to fall back upon Teplitz, and the allies were only extricated from a dangerous dilemma through the valor of the Russian general, Duke Eugene of Würtemberg; but the latter would have been overwhelmed on Aug. 29 in the valley of Kulm, if his division had not made a most desperate resistance, and if the king of Prussia, on hearing of the emperor Alexander being on the battle field, had not sent reinforcements. These en-

abled the allies to maintain their position at Arbesau near Kulm. As the night approached Vandamme encamped in the vicinity of Kulm, anticipating the arrival of Napoleon, or at least of Marshal Mortier; but the former had already left for Pirna, and both were soon obliged after the defeat at Grossbeeren to return to Dresden. The French were on the following day surrounded by the allies, who had been placed by Schwarzenberg under the command of the Russian general Barclay de Tolly. The left wing, which occupied the heights of Kulm, was turned early in the day, while Kleist attacked the French in the rear from the direction of Nollendorf. After a futile attempt to cut his way through to the latter place, Vandamme was obliged to surrender with three other generals and 10,000 men as prisoners of war, after having lost 5,000 men and over 80 pieces of artillery.

**KULM**, a town of Prussia. See **CULM**.

**KUM**, or **Koom**, a town of Persia, capital of a district of the same name in the province of Irak-Ajemi, 78 m. S. by W. of Teheran. It is important from its situation on the high road between the N. and S. portions of the country. Anciently it was a place of great magnificence, and had a population of 100,000; the number is now only about 8,000. Portions of the town are in ruins, it having been destroyed by the Afghans when they invaded Persia in 1722. Within its walls is the tomb of Fatima, a near descendant of the prophet, who is believed to have an intercessory influence. Her tomb is covered with plates of gold, and the city is on her account one of the most favorite burial grounds in the country. The bazaars are numerous and extensive. There are manufactures of chinaware of inferior quality, of pottery, and of jars for cooling water, which are much esteemed. The town is supposed to occupy the site of the ancient Choana, and to have been built early in the 9th century, from the ruins of seven towns, which composed a small sovereignty under an Arabic prince.

**KUMANIA**. See **CUMANIA**.

**KUMAON**, a district of the Northwest Provinces in British India, bordering on the Himalaya mountains, Nepaul, Rohilcund, the Dehra Doon, and the district of Gurwhal; area, about 7,000 sq. m.; pop. in 1872, 430,300. The surface is very diversified. The southern portion is either forest-clad plain almost destitute of water, or marsh land, while toward the north the surface is broken by numerous mountains, some of which are among the highest in the world. The climate in the low region is sultry and deadly; in the alpine districts, temperate, invigorating, and healthful. Earthquakes are common. The principal rivers are the Kalee, Goonka, Aluknunda, Surju, and Gorigunga. The valleys and low lands are fertile, and in the warmer districts yield two crops annually. The tea shrub has been successfully introduced. The chief mineral productions are gold, lead, copper, and iron. The

gold is chiefly found in the sands of the Alukunda. The principal manufactures are blankets, coarse linens and cottons, and bamboo mats and baskets. A large portion of the inhabitants are engaged in the transit trade between East Turkistan and India. A corrupt form of Brahmanism is the dominant faith. Kumaon is famous for the number of its shrines and temples, mostly situated at the confluence of its rivers. Those most celebrated as places of pilgrimage are Kedarnath, Badrinath, Deoprayag, Rudraprayag, and Vishnuprayag. Kumaon was never conquered by the Moguls, but was subdued by the Gorkas in the latter part of the 18th century. It became a British province in 1815. Capital, Almorah.

**KUMISS**, an alcoholic liquor distilled by the Calmuck Tartars from mares' milk as it is undergoing fermentation. It is said that 21 oz. of milk yield 14 oz. of low wines, which by rectification give 6 oz. of pretty strong alcohol. Cows' milk, probably from its containing less saccharine matter, yields much less spirit.

**KUNERSDORF**, a village of Prussia, near Frankfort-on-the-Oder, noted for a battle fought Aug. 12, 1759. After the failure of Gen. Wedel (July 23) to prevent the junction of the Russians and Austrians on the Oder, Frederick instructed Prince Henry to replace him in watching the main Austrian army under Daun, while he crossed the Oder and gave battle to the allies. Despite a furious fire, he stormed the Mühlberg, turning the Russian left wing, and considered the day his, when, owing both to the difficulties of the ground and the wearied condition of his troops, with whom he now assailed the strongly posted right wing, the tide turned in favor of the allies. The latter, out of an army variously estimated at from 60,000 to 90,000, lost 18,000, and according to some authorities 24,000; while the Prussians, out of an army of 40,000 to 50,000 men, lost in killed and wounded 19,000, or according to others 26,000, and almost all their batteries. Gen. Puttkammer and the poet Chr. Ewald von Kleist fell. Frederick had two horses shot under him, and escaped capture only through one of his officers. The principal Russian commander was Soltikoff, and the victory was chiefly decided by the panic created among the Prussians by the Austrian general Laudon's impetuous cavalry attack on their flank.

**KUNG, Prince** (KUNG-CHEN-WANG), a Chinese statesman, born in 1835. He is the brother of Hien-fung, emperor of China from 1850 to 1861, and the uncle of Tung-che, the present ruler. On the death of Hien-fung, almost immediately after the close of the war against England and France, the heir to the throne was a child seven years old. In the regency which was at once established, Prince Kung, who had previously occupied a high official position at court, but had not been an active member of the executive government, received a power nominally equal to that of the young emperor's mother and aunt, who were asso-

ciated with him; but he immediately became recognized as the actual head of affairs, and, though frequently hampered in his action by the opposition of his two companions in power, he continued to be *de facto* ruler until the emperor attained his majority, Feb. 23, 1873. His policy was throughout this period enlightened and progressive, and whatever advance was made in the political improvement of China and her relations with foreign powers is undoubtedly chiefly due to him; while he consistently opposed all conservative action and the policy of seclusion previously practised. Many of the more liberal treaty stipulations, the establishment of a college at Peking, and the sending of an embassy to foreign powers in 1868, were largely owing to his efforts. After the accession of the emperor, Prince Kung remained at the head of the foreign office.

**KUNTH, Karl Sigismund**, a German botanist, born in Leipsic, June 18, 1788, died in Berlin, March 22, 1850. Alexander von Humboldt enabled him to study in Berlin, and he joined him in Paris in 1813 to continue, after Willdenow's death, the editing of Humboldt and Bonpland's botanical collection. He returned to Berlin in 1819, and became professor of botany and vice director of the botanical garden. His works include *Nova Genera et Species Plantarum* (7 vols., Paris, 1815-'25), and *Enumeratio Plantarum omnium hucusque cognitarum* (5 vols., Stuttgart, 1833-'50); and he continued Bonpland's monographs of melastomæ and equinoctial plants, altogether including 6,000 specimens.

**KUOPIO. I.** A S. län or government of Finland, Russia; area, about 17,000 sq. m.; pop. in 1871, 222,321, mostly Lutherans. A large part of the surface is occupied by lakes, and the rest consists generally of large sandy plains, diversified by hills and forests. The Vuoxen traverses the län, flowing southward into Lake Saima and thence eastward into Lake Ladoga. The principal occupations are rearing of cattle and horses, agriculture, and fishing. **II.** A town, capital of the län, pleasantly situated on a W. promontory of Lake Kalla, 225 m. N. W. of St. Petersburg; pop. about 5,000. It contains a church and a gymnasium, and exports resin and timber. The periodical fairs are numerously attended.

**KUR, Koor, or Kura** (anc. *Cyrus*), a river of Russian Georgia, which rises in the mountains W. of Kars, in the Turkish vilayet of Erzerum. It flows N. E. into Transcaucasia until it approaches the S. base of the Caucasus, when it turns E. S. E. and runs nearly parallel with that range to the Caspian sea, which it enters by three mouths 80 m. S. S. W. of Baku. It is about 800 m. long, and navigable 66 m. from its mouth by small vessels. Its banks are high, and well wooded except near its mouth. Its waters are yellowish and turbid, and the current, though smooth, is rapid. Its principal affluents are the Aras and Alazan. Gori and Tiflis are on its banks.

**KURDISTAN**, or **Koordistan** ("the country of the Kurds"), an extensive region of western Asia, comprised chiefly within the basin of the Tigris, between lat. 34° and 39° N., and lon. 39° and 47° E., and belonging partly to Turkey, partly to Persia; area, about 40,000 sq. m.; pop. estimated by Ritter at 800,000, by others as high as 3,000,000. Its limits are not well defined. Persian Kurdistan is comprised chiefly in the province of Irak-Ajemi, and the Turkish in the vilayet of Diarbekr. Mountain ranges from 3,000 to 13,000 ft. in height, of which many peaks are covered with snow during six months in the year, occupy the north, breaking the surface into deep, narrow valleys, and rugged table lands, of which the most extensive are on the confines of Armenia. With the exception of three ranges of hills of no great altitude, the southern portion of the territory is low and level. The principal rivers are the Tigris, the Great Zab (the Zabatus or Lycus of ancient Assyria), the Little Zab (the ancient Caprus), the Diyalah, and the Adhem. There are several lakes, of which the most considerable are Van and Urumiah. The soil is very fertile. The climate ranges from extreme heat to extreme cold; the winters in the north are very severe, and the summers in the south are attended by an equally intense heat. The country has but little mineral wealth, but alum, sulphur, and iron are found, and there are a number of salt springs. Forests of oak, pine, and plane trees clothe the mountains; grains of all kinds, rice, tobacco, flax, and hemp, excellent wines, and the usual fruits of temperate climates, thrive on the hills and plains. Mulberry trees, for silkworms, are cultivated. Cotton is found to succeed in certain localities. A remarkable vegetable production is found here, answering in most respects to the manna which fed the children of Israel in the wilderness; it is collected from leaves of trees and occasionally from the ground, and is dried, pounded, and eaten as a sweetmeat. The gigantic rose is a floral production peculiar to the country. Vegetables of all kinds, especially melons and cucumbers, grow to extraordinary size. Honey is produced largely. Medicinal plants, especially gall nuts of superior quality, are largely exported, by way of Alexandretta and Smyrna. Agriculture employs little attention or skill. Flocks and herds constitute the wealth of the inhabitants. The horses are small, but capable of great endurance, and are much in demand for the Turkish and Persian cavalry. They are worked under the saddle only, oxen being the beasts of draught. Camels are little used, owing to the broken nature of the ground. The live stock chiefly consists of long-tailed sheep, with wool of the most delicate fibre. The principal wild animals are the panther, bear, lynx, jackal, hyæna, and fox. Many varieties of game abound.—The Kurds are supposed to be descendants of the ancient Carduchi. (See **CARDUCHI**.) Their complexion is light, and

their physiognomy animated. Sharp but delicate features, an ample and open forehead, deep-set, dark, and intelligent eyes, a finely cut mouth shaded by a moustache, good teeth, small and handsomely shaped hands and feet, and a well proportioned frame, give to them a remarkable elegance of person; while their active habits impart a strength of body which renders them physically one of the finest people of Asia. They are good horsemen, expert in the use of arms, adventurous and daring, inclined somewhat to brigandage, but hospitable. The young women are very beautiful, but the shrivelled look of age comes upon them very early. The national costume resembles that of the Turks. The men wear a cloak of black goats' hair, and a red cap around which is wound a silk shawl falling down upon the shoulders. Only the aged wear beards. The women, except a few of the highest rank, do not veil; they are treated with more respect than in most eastern countries. The Kurds lead partly a stationary and partly a nomadic life. They occupy stone dwellings, of which those of the wealthy are crowned with a tower. The beys or chiefs retire in time of danger with their tribes into a kind of fortifications constructed in the crevices of steep mountains. The chiefs have a despotic control over their tribes, and are almost constantly at war with each other. The recently perfected political division of the countries of Asiatic Turkey have resulted in a more complete recognition of the authority of the sultan, though the chieftainships of the emirs, khans, beys, and aghas still continue among them. The Persian tribes are considered the wildest of all, and maintain their independence with better success than those in the territory of Turkey. They are divided into three totally distinct classes or castes: warriors (*sipahs*), cultivators (*rayahs*), and villagers (*koilû*).—The language of the Kurds belongs to the Iranian section of the Indo-European family. It is closely related to the Neo-Persian, and may be considered a dialect of it. But though the grammatical structure is Iranian, the vocabulary is strongly mixed with Turkish, especially in the eastern Kurd dialects, and is also full of Arabic words, owing in a measure to their adoption of the Mohammedan religion. It is written with the Persian-Arabic alphabet, but as few Kurds learn to write, it has no literature except songs. As the Kurds appear to be one of the earliest Indo-European tribes which migrated to S. W. Asia, the language is particularly deserving of study. The numerals from 1 to 10 are: *yek, du, seh, tchar, besh, shesh, haft, hasht, nah, dah*. Some of the pronouns are: *me, meh*; they, *tah*; my, *men*; our, *mah*. These pronouns are added to the words by means of connecting vowels, as *bahb, father; bahbehmen, my father; bahbehtah, thy father; bahbehmah, our father*. The literature of the Kurds is as well represented as it can be by a rich collection of manuscripts at Erzerum.

Sheikh Ahmedi is a celebrated poet of the 16th century, and his best production seems to be a love story entitled *Nem-u-Zine*. The names of Mollah Hezir, also called Neali Effendi, and of Ahmed Effendi, are those of the most learned Kurds of modern times. A grammar and vocabulary of the Kurdish language was prepared by Garzoni (Rome, 1787). Rödiger and Pott have written *Kurdische Studien*, in vols. iii. and iv. of the *Zeitschrift des Morgenlandes*; the structure of the language has been described by Dorn and Schafy, *Beiträge zur Kenntniss der iranischen Sprachen* (St. Petersburg, 1866).—In religion the majority of the people profess to be Mohammedans of the sect of Omar, but their creed is tinctured with remnants of the old Manichæan and Magian systems, and they have many superstitious practices not sanctioned by the Koran. About 100,000 are Nestorian Christians, locally known as Kaldani. (See NESTORIANS.) These Christians inhabit the valley of the Tigris and the mountains which skirt it on the east. There is a church and priest in almost every one of their villages.

**KURILE ISLANDS**, a chain of small islands in the Pacific ocean, extending from the S. extremity of Kamtchatka to Yezo, the northernmost of the Japanese islands. They lie between lat. 42° and 51° N., and lon. 145° and 157° E., are 26 in number, and reach over a space of more than 700 m. in length. They are divided into the Great Kuriles, which belong to Japan, and the Little Kuriles, which are subject to Russia. The largest of the former are Kunashir and Iturup; of the latter, Sumshu, Poromushir, Onokotan, and since 1856 also Urup. The surface of these islands is very irregular. There are eight or ten volcanoes, still for the most part in a state of ignition. The height of the northernmost of them, on the island of Alaïd, known for its great eruptions in the years 1770 and 1793, is calculated at from 12,000 to 15,000 ft. The shores are in general rocky and precipitous, and, in consequence of the violent currents which prevail around them, very difficult of access. Several of the Kuriles are uninhabited, and several uninhabitable for want of water; but many are fertile, well wooded, and produce game and fish in abundance. The climate is tempestuous, severe, and foggy. The vegetable productions are few and unimportant. The principal animals are bears, wolves, foxes, sables, otters, seals, and fowl. The chief commerce is carried on with Russia, China, and Japan. The minerals are iron, sulphur, and copper. The people, very few in number, are in general of low stature, dark complexion, and more hairy than the other races of E. Asia. Their habits are excessively filthy, but their disposition is honest and gentle. In manners and customs the northern islanders resemble the Kamtchatdales; the southern, who are termed Ainos, to some extent the Japanese. (See AINOS.) The islands were first discovered by the Russians in 1713;

five of them were known in 1720, and the whole archipelago in 1778.

**KURRACHEE**, or **Karachi**, a seaport town of Sinde, India, in the presidency of Bombay, capital of a district of the same name, 91 m. S. W. of Hydrabad; pop. about 30,000. It is situated on a bay of its own name in the Indian ocean, W. of the delta of the Indus, and near the frontier of Beloochistan. It is built on a plain between the sea and a range of mountains, and has a spacious harbor, obstructed however by a bar which cannot be safely crossed by vessels drawing more than 16 ft. of water. A mole has been built by the British, and a road constructed from it to the town, which is about 3 m. distant. The point of Munorah, at the extremity of a promontory S. of the harbor, is fortified. As the only safe port in Sinde, Kurrachee is an important commercial centre, and it is the terminus of the Sinde railway, which connects it with Kotree, opposite Hydrabad on the Indus. A submarine telegraph gives it communication with Muscat and Alexandria. Kurrachee has warehouses, banks, and other requisites of a large trade, and maintains regular steam communication with several towns in India, Persia, Africa, and Europe. The annual imports and exports are estimated at \$30,000,000. It exports camels, fish, hides, tallow, ghee, oil, oil seeds, bark, saltpetre, salt, indigo, cotton, and grain, and imports metals, hardware, cotton, silks, twist, and yarn, besides having an active transit trade with Cashmere, Afghanistan, Thibet, and Turkistan. It contains an English church and school.

**KURSK. I.** A S. government of Russia, bordering on the governments of Orel, Voronezh, Kharkov, Poltava, and Tchernigov; area, 18,890 sq. m.; pop. in 1867, 1,866,859. The surface is in general undulating, the climate mild and dry, and the soil fertile. The principal rivers are the Seim, Vorskla, and Oskol. The most valuable minerals are iron, limestone, and nitre. The manufactures consist of coarse cloths, leather, soap, spirits, and earthenware. The most important cities are Kursk, Rylsk, Belgorod, Stary-Oskol, Mikhailovka, and Miropolie. **II.** A city, capital of the government, on the Tuskar, a tributary of the Seim, 280 m. S. by W. of Moscow; pop. in 1867, 28,921. It is a large town, with narrow, ill-paved streets, numerous churches, and a magnificent edifice occupied by the government. It carries on a considerable trade with St. Petersburg and Moscow, and is the seat of the civil and military governors of the province, and of the archbishop of Kursk and Belgorod.

**KURZ**, **Heinrich**, a German author, born in Paris, April 28, 1805, died in Aarau, Switzerland, Feb. 24, 1873. He graduated at Leipsic, and after the revolution of 1830 became a journalist at Munich, where he was imprisoned during two years for political offences. From 1834 to 1839 he was professor at St. Gall, Switzerland, and after losing this post on account of being a Protestant and alien, he re-



ceived a professorship at Aarau. He published popular manuals of German poetry (3 vols., Zürich, 1840-'43) and prose (3 vols., 1845-'6). Among his works are *Geschichte der deutschen Literatur* (4 vols., Leipsic, 1851-'72), *Leitfaden zur Geschichte der deutschen Literatur* (1860; 4th ed., 1872), *Deutsche Bibliothek* (10 vols., 1862-'8), and *Bibliothek der deutschen Nationalliteratur* (125 numbers, Hildburghausen, 1867-'72).

**KUSKOQUIM RIVER.** See ALASKA.

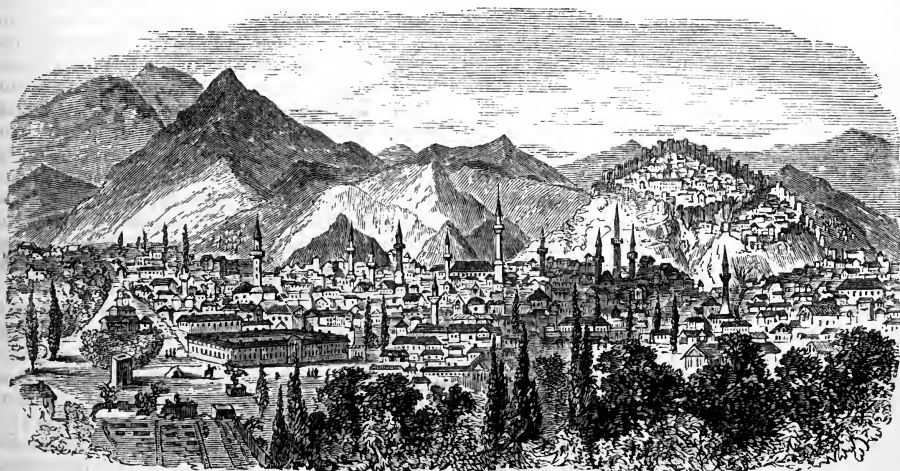
**KÜSSNACHT**, a village of the canton of Schwyz, Switzerland, at the foot of the Rigi, on a N. arm of the lake and 8 m. N. E. of the city of Lucerne, at the bottom of the bay of Küssnacht; pop. in 1870, 2,853. It is celebrated for its association with William Tell. Near it is the ruined wall called Gessler's castle, although it has been discovered that it never belonged to him; also the hollow way, referred to in Schiller's drama of "Tell," through which the Swiss patriot shot Gessler with his unerring arrow. The hollow way has almost disappeared through the building of a new road. At the end of the lane stands Tell's chapel, which was originally dedicated to the "Fourteen Helpers in Need" (the Saviour, the Virgin, and the apostles).—There is another village of the same name on the lake and 4 m. S. E. of the city of Zürich; pop. about 2,500.

**KUSTENDJI**, or **Küstendjeh**, a town of European Turkey, in the Dobrudja, the N. E. part of the vilayet of the Tuna (Danube), 70 m. E. by N. of Silistria, on the Black sea; pop. about 5,000. It stands upon a level but elevated point of land, which almost assumes the form of a peninsula, near the termination of Trajan's wall, of which traces still exist. The port of Kustendji is shallow, but affords safe anchorage during the summer. The town was called Con-

stantia in ancient times, after a sister of Constantine the Great, who built it, and is still called Kostantza by the modern Greeks. A railway, about 35 m. long, here connects the Danube with the Black sea, and has greatly increased the prosperity of the town. Inscriptions and other remains of the ancient city of Tomi, where Ovid died, have recently been found in the vicinity of Kustendji.

**KÜSTRIN**, or **Cüstrin**, a town of Prussia, in the province of Brandenburg, near the junction of the Warthe with the Oder, which is spanned by a bridge about 900 ft. long, on the railway from Berlin to Dantzic, 48 m. E. of the former city; pop. in 1871, 10,122, exclusive of the garrison. It is a fortress of the third rank, and contains three suburbs, a royal palace, two churches, a gymnasium, and several other schools. In the vicinity are many sugar refineries, and the local and coasting trade is active. It was founded early in the 16th century, and became the capital of the Neumark and of the margrave John, known as John of Küstrin and as John the Wise, a zealous reformer, who built the fortress and the palace, covering the latter with copper. Frederick the Great, while crown prince, was confined here for a time by his father; and Lieut. Katt, his intimate friend and alleged accomplice in his proposed flight to England, was beheaded here, Nov. 6, 1730. The fortress was bombarded by the Russians, Aug. 15-22, 1758, and saved only from utter destruction by Frederick the Great. Soon after the battle of Jena (1806) the Prussian commander hastily surrendered it, though it had sufficient provisions to hold out for a long time; and the French occupied it till early in 1814, when they capitulated.

**KUTAIEH**, or **Kutaya**, a town of Asiatic Turkey, capital of a district of the same name in



Kutayah.

the vilayet of Khodavendighiar, 170 m. N. E. of Smyrna, on the Kutaieh-su, the principal

upper branch of the Pursak; pop. about 60,000. It is the centre of the district where



the famous Turkish carpets are manufactured, and of a considerable trade and industry, the surrounding country being extremely productive in grain, cotton, gall nuts, fruits, goats' hair, and wool. The town possesses about 30 mosques, three Armenian and Greek churches, fountains, baths, bazaars, and fine private residences with gardens attached to them. A treaty of peace was concluded here in 1833 between Mehemet Ali and the Porte. Kossuth was confined here by the Turkish government in 1850-'51. In the town is an old castle built on the site of the ancient Cotyæum, a town of Phrygia.

**KUTAIS.** I. A government of Asiatic Russia, in Caucasia, bordering on the Black sea and Asiatic Turkey, and embracing the territories of Mingrelia and Imerethia; area, 8,039 sq. m.; pop. in 1871, 605,691. Most of the surface is mountainous. The principal rivers are the Ingur and the Rion, the ancient Phasis. About one sixth of the inhabitants are Moslems. II. A town, capital of the government, on the Rion, 115 m. W. N. W. of Tiflis; pop. in 1867, 8,263, mostly Armenians and Jews. It has a gymnasium, several bazaars, and an important trade in corn, wine, silk, and cattle. Near it, on a hill, are the ruins of the ancient fortress, which in 1770 was destroyed by the Russians. Kutais is built on the site of the ancient Cutatisium or Cytæa, the capital of Colchis and the birthplace of Æetes and Medea. It was formerly the capital of the province of Imerethia, which belonged to Georgia.

**KUTTENBERG** (Boh. *Kutna hora*), a town of Bohemia, 38 m. E. S. E. of Prague; pop. in 1870, 12,747. It has several churches and monasteries, an *Oberrealschule*, manufactories of beet sugar, and important lead mines. Formerly the mines also yielded a considerable amount of silver ore, and in 1300 the first silver groschens were coined here. On Jan. 6, 1422, the town was burned down by the Hussites.

**KUTZOFF, Mikhail**, prince of Smolensk, a Russian general, born in 1745, died in Bunzlau, Prussian Silesia, April 28, 1813. He commenced his military career at the age of 16, and distinguished himself in the campaigns in the Crimea, in which he was several times severely wounded. In 1783 he became a general of brigade, in 1784 a major general, and in 1790 he led under Suvaroff the assault against Ismail, at the taking of which 30,000 Turks were put to the sword. In 1791 he was made lieutenant general, and shared in the victory over the Turks at Matchin, which led to the treaty of Jassy. He was ambassador to Constantinople in 1793, and subsequently filled important military and diplomatic stations under Catharine II., Paul, and Alexander. In 1805 he entered Germany with 50,000 men to form a junction with the Austrians, and gave the corps of Mortier a decided check at Dürrenstein, thereby temporarily deranging Napoleon's plans, for which he received from the emperor of Austria the grand cordon of Maria

Theresa. He was present at Austerlitz in command of the allied forces, but was not responsible for the disaster of the day, having dissembled entirely from the plan of the cross march to outflank the French. In the subsequent war with Turkey he gained fresh laurels, and concluded an advantageous peace at Bucharest in May, 1812. In August of the same year he was appointed to supersede Barclay de Tolly in command of the Russian forces opposed to the grand army led by Napoleon against Moscow. On Sept. 7 he hazarded a battle at Borodino against the whole French army led by Napoleon in person. Although the issue of that conflict was in favor of the French, the Russians losing 52,000 men, and being obliged to resign Moscow, the national pride of the latter was gratified by this obstinate stand against their enemy, who lost 30,000 men, and Kutuzoff received in recompense a field marshal's baton. He subsequently concentrated his forces at Tarutino, midway between Moscow and Kaluga, and watching his opportunity routed the French advanced guard under Murat and Poniatowski at Vinkovo, Oct. 18. On the 24th was fought the battle of Malo-Yaroslavetz, by which, although the French remained masters of the field, Napoleon was checked in his line of march, and compelled to retreat along the wasted line of the Smolensk road. Following the enemy, Kutuzoff defeated the corps of Eugène Beauharnais at Smolensk, Nov. 16, and on the two succeeding days Davoust and Ney at Krasnoi, capturing 26,000 prisoners and over 200 pieces of cannon, and inflicting a loss of 10,000 men upon the enemy, his own troops losing but 2,000. As a reward for the skilful manœuvres which had brought about these successes, he was created prince of Smolensk. After the passage of the Beresina he pursued the French more leisurely, and upon entering Wilna in December he found the campaign virtually ended, although the pursuit was continued as far as Kalisz, where the Russians paused, in the latter part of January. Having issued from this place a proclamation announcing the dissolution of the confederacy of the Rhine, and calling upon its members to join in the league formed for the deliverance of Germany, he crossed the Oder, and following on the traces of the enemy reached Bunzlau, where his constitution, enfeebled by the rigors of the campaign, yielded to an attack of malignant typhus fever.

**KÜTZING, Friedrich Traugott**, a German naturalist, born at Ritteburg, Thuringia, Dec. 8, 1807. He studied in Halle, explored southern Europe, and became professor at Nordhausen. His principal works relate to the algæ, including *Tabulæ Phycologicae* (Nordhausen, 1845-'71); and in his *Grundzüge der philosophischen Botanik* (2 vols., Leipzig, 1851-'2), he anticipated the doctrines of Darwin.

**KUTZNER, Johann Gottlieb**, a German author, born at Pohlschildern, Feb. 27, 1822, died at Hirschberg, Jan. 5, 1872. He was a teacher

in the latter city from 1848, and published, besides other works, *Die Lehre vom Menschen* (Glogau, 1854); *Die Reise seiner königlichen Hoheit des Prinzen Waldemar von Preussen nach Indien, 1844-'6* (Berlin, 1857); *Geographische Bilder* (2 vols., 1858); *Populäre Erdbildungskunde* (Langensalza, 1858); *Die Weltgeschichte in zusammenhängenden Einzelbildern* (3 vols., Berlin, 1858-'9); *Der illustrierte Rübzahl* (Hirschberg, 1859); *Der Weltfahrer Dr. Kane* (Leipsic, 1860); and *Der deutsch-französische Krieg* (2 vols., Leipsic, 1870-'71). He left in manuscript two volumes of *Naturlehre*.

**KUYP, Albert.** See **CUYP**.

**KWANGSI**, or **Quangsi**, a S. province of China, bordering on the provinces of Yunnan, Kweichow, Hunan, and Kwangtung, and the territory of Tonquin; area, 78,250 sq. m.; pop. about 7,000,000. It is watered by branches of the Tao or Si-kiang. Rice is largely produced along the river banks. Gold, silver, and quicksilver are mined. The mountainous character of the province is unfavorable to agriculture, and the population is less dense than in most other parts of China. Principal town, Wuchow; capital, Kwelin.

**KWANGTUNG**, the most southerly province of China, bordering on the gulf of Tonquin and the China sea, and the provinces of Fokien, Kiangsi, Hunan, and Kwangsi; area, 79,456 sq. m.; pop. about 19,000,000. It is mountainous in the north, but the region near the Tonglong river, the Po-kiang, and Si-kiang and the sea-coast is among the most fertile in China. The province is the centre of the production of sugar, and among the other products are tea, rice, silk, tobacco, and fruits. Lacquered wares, cotton and silk goods, and other articles are largely manufactured. The numerous bays and rivers facilitate commerce, and along the coast are a large number of islands, including that of Hainan. Capital, Canton.

**KWEICHOW**, a S. W. province of China, bordering on the provinces of Szechuen, Hunan, Kwangsi, and Yunnan; area, 64,554 sq. m.; pop. about 5,000,000. It is rough and mountainous, and is one of the poorest parts of China. Cereals, rice, tobacco, cassia, and timber are produced; also copper, iron, lead, and quicksilver. The largest river is the Wu, a tributary of the Yangtse. Capital, Kweiyang.

**KWICKPAK RIVER.** See **ALASKA**.

## L

**L**, THE 12th letter of the Phœnician and other Semitic graphic systems (*lamed*) and of most modern European alphabets, the 23d in Arabic, the 27th in Persian and Turkish, and the 11th in Greek (*λάμδα*), the 12th before the dropping of the digamma and Latin. It is one of the four liquids of grammarians (*l, m, n, r*), and of the four *akshara yavarga* (*ya, ra, la, va*) or semi-vowels in the Devanagari. The sound is produced by placing the tip of the tongue against the upper incisor teeth, while the breath issues at its sides and the larynx vibrates; and it is hence called a linguo-dental. Priscian attributes to the Latin L three sounds, one full, one middle, and one slender. In English, German, and other languages, it has but one sound. The French *l mouillé* (*ly* uttered with one breath, as in *million*) is generally expressed by *ll* following *i*, as in *tilleul*, but sometimes by *l*, as in *cil*, and *lh*, as in *gentilhomme*. The Spanish *ll* always has the *mouillé* sound, even as an initial, and is reckoned as a separate character in the alphabet. It is expressed in Portuguese by *lh*, in Italian by *gl* before *i*, and in Magyar by *ly*, in all positions. The Polish, Ruthenic, and Lusato-Vendic barred *ř* is pronounced by pushing and swelling the tongue to the palate, as in Pol. *řlaski* (Ger. *platt*), flat. The Welsh *ll* is pronounced with a hissing, as in *llán* or *lhn* (temple), *Lloyd*, &c., almost as if written *fl*. Some nations and persons cannot pronounce *l*, as for instance the Japanese, who use *r* in its stead, as in *Sagarien* for Saghalian. The Chinese, on the contrary, unable

to utter *r*, always substitute *l*, as in *Kilisit* for Christ. There was no L in Zend. It is often mute in English before consonants, as in *could, calm, half, psalm*, &c. (although pronounced in similar positions in all other languages), and when final in some French words, as in *baril, outil, sourcil*, in *fil*, &c. In words transferred from one language to another, *l* is often interchanged with *r, n, d, i, or u*; as Eng. *pilgrim* (Lat. *peregrinus*), Fr. *orm* (Lat. *ulmus*, elm), Lat. *lympha* (Gr. *λύμηνη*), *Ulysses* (Ὀδυσσεύς), Ital. *fiore, bianco* (Lat. *flora, blaneus*), Dutch *goud* (gold), &c.—As a numeral sign, L denotes 30 in the Semitic (except Ethiopian, where it marks 2), Greek, Russian, Armenian, Cyrillic, and Georgian; 50 in Latin and Glagolitic (in the former as being a half of the ancient L or C, *centum*). A dash above it raises these values to as many thousands. In rubrication it marks 11. In abbreviations it stands for *Lucius, Lælius, Lares, libens, libertus, locus, latus, libra* (£, pound sterling), &c. L. S. stands for *locus sigilli*, place of the seal; LL. D. for *legum doctor*, doctor of laws. On old French coins L stands for Bayonne.

**LAALAND**, an island in the Baltic belonging to Denmark, lying between lat. 54° 38' and 54° 58' N., and lon. 10° 58' and 11° 53' E.; greatest length 37 m., greatest breadth 17 m.; area, 460 sq. m.; pop. in 1870, 62,000. Together with Falster and several small islands, it forms the district of Maribo (area, 640 sq. m.; pop. in 1870, 90,706). The surface of Laaland is low, level, and mostly marshy. The

water is bad, and the climate unhealthy; but the soil is fertile, and yields good crops of corn, beans, hops, and hemp. There is a lake called Maribo near the centre of the island, which is almost 5 m. in length. There are five towns: Maribo, the capital, Nakskov, Nysted, Rödby, and Sakkjöbing.

**LABADIE, Jean de**, a French mystic, born at Bourg-en-Guienne in February, 1610, died in Altona, Holstein, Feb. 13, 1674. He was educated at the Jesuits' college of Bordeaux, and was for some time a member of that society; but in 1650 he became a Protestant, settled at Montauban, was elected pastor of the church, and remained there eight years, during which he founded a mystical sect, resembling the quietists of his old communion, and called Labadists. Being at length banished from Montauban for sedition, he went first to Orange, and afterward to Geneva, whence in 1666 he was invited to Middelburg, Holland. Here his followers increased in number, and included many persons of rank and education, among whom were Anna Maria von Schurmann and the princess palatine Elizabeth. The heterodoxy and contumacy of Labadie, however, led to his deposition by the synod of Naarden, and to his banishment from the province. He formed a church in a small village near Amsterdam, and established a press for the publication of his works, but was ultimately compelled to remove to Altona. The Labadists do not now exist.

**LABANOFF DE ROSTOV, Alexander**, prince, a Russian author, born in 1788. He was aide-de-camp to Alexander I. and Nicholas from 1813 to 1828, when he retired with the rank of major general. He published numerous works based on official documents relating to Mary Stuart, the principal being *Lettres, instructions et mémoires de Marie Stuart, reine d'Ecosse* (7 vols., Paris, 1844, and a supplementary volume), which are regarded as the most authentic authority on the subject. He presented his valuable library to the government.

**LABARUM**, the military standard of Constantine the Great, adopted by him in commemoration of the appearance of the cross in the sky when he was on the march against Maxentius. It consisted of a pole or pike with a horizontal bar forming a cross, from which depended a square purple banderole, ornamented with fringes and precious stones. The staff was surmounted by a golden crown set with jewels, in the midst of which was the monogram of Christ, with the occasional addition in later times of the Greek letters alpha and omega. On medals of Valentinian I.



Labarum, from a Medal of Valentinian I.

it is represented without the crown and with the monogram on the banderole; and sometimes the figure of Christ was displayed on the latter. Prudentius says that "Christ, woven

in jewelled gold, marked the purple labarum." Julian the Apostate removed the sacred symbols and substituted for them the ancient S. P. Q. R., but Jovian restored them. The origin of the word is involved in obscurity, and scholars are undecided when it was first applied to the Roman standard; but it is found on coins and medals of the first emperors, especially on those connected with the Germanic and Armenian wars. Under the pagan emperors the ensign usually bore the image of the emperor or that of Jupiter, Mars, or Mercury.

**LABAT, Jean Baptiste**, a French missionary and historian, born in Paris in 1663, died there, Jan. 6, 1738. He entered the order of the Dominicans, taught philosophy at Nancy, afterward devoted himself to preaching, and became a missionary to the Antilles. After remaining two years at Martinique, he passed in 1696 to Guadeloupe, where he established a station of his order, and also distinguished himself as an engineer and agriculturist. On his return to Martinique he was appointed *procureur général* of the mission, and for his diplomatic and scientific services was held in esteem by successive governors. He explored the archipelago of the Antilles, founded in 1703 the city of Basse-Terre, and in that year took an active part in the defence of the island against the English. He organized a company of 60 negroes, who, as he said, destroyed more of the enemy than all the French troops. By the decease of his associates, he gradually united in his own person nearly all the higher offices of his order in the Antilles, and in 1705 returned to Europe to obtain recruits. He was detained by his superiors at Rome till 1709, and at Civitá Vecchia till 1716, after which he went to Paris, where he passed the rest of his life. His principal works are: *Nouveau voyage aux îles de l'Amérique* (6 vols. 12mo, 1722); *Nouvelle relation de l'Afrique occidentale* (5 vols., 1728); and *Voyage en Espagne et en Italie* (8 vols., 1730).

**LABANUM**. See LADANUM.

**LA BÉDOLLÈRE, Émile Gigault de**, a French author, born in Paris, May 24, 1814. He has been extensively connected with journalism, was one of the founders of the *Univers illustré*, and from 1850 one of the editors of the *Siècle*, and in 1869 assisted in founding the new *National*. He has written histories of the French campaigns from 1792 to 1815, the Crimean war, the British war in India, the Italian war of 1859, the Mexican war, and the German and Italian war of 1866. His miscellaneous writings comprise almost every variety of literature, including *Histoire des mœurs et de la vie privée des Français* (3 vols., 1847-'9), *La France et la Prusse* (1867), and translations of "Uncle Tom's Cabin," Hildreth's "White Slave," and various novels of Scott, Cooper, Dickens, Marryat, and Mayne Reid, and other works.

**LABEDOYÈRE, Charles Angélique François Huchet de**, count, a French soldier, born in Paris, April 17, 1786, shot at Grenelle, Aug. 19, 1815.

He was aide-de-camp to Lannes and Prince Eugène, and was severely wounded at the battle of Lützen in 1813. In the same year he married a lady of the legitimist Chastellux family, and after Napoleon's first abdication he entered the service of the Bourbons, but was the first to join the emperor after his return from Elba, who made him general and peer. He was one of the last to leave the battle field at Waterloo. Supporting Napoleon II., and excepted from the amnesty, he left Paris, but imprudently returned, and Louis XVIII. had him shot despite the efforts of Benjamin Constant. Napoleon left 150,000 francs to his heirs.

**LABETTE**, a S. E. county of Kansas, bordering on Indian territory; area, 624 sq. m.; pop. in 1870, 9,973. It is drained by the Neosho river and affluents of the Verdigris. The Missouri, Kansas, and Texas railroad passes through it. The chief productions in 1870 were 28,514 bushels of wheat, 128,543 of Indian corn, 32,489 of oats, 13,484 of potatoes, 69,218 lbs. of butter, and 5,956 tons of hay. There were 2,644 horses, 2,538 milch cows, 1,990 working oxen, 5,413 other cattle, 2,910 sheep, and 2,540 swine; 3 manufactories of furniture, 4 of tin, copper, and sheet-iron ware, and 8 saw mills. Capital, Oswego.

**LABIENUS, Titus**, a Roman general, died in 45 B. C. He was tribune in 63, the year of Cicero's consulship, and carried some measures in the interest of Cæsar, who in 58 took him as his lieutenant into Transalpine Gaul, and made him pro-prætor. He served with ability, and commanded the troops during Cæsar's absence. In 54 he twice defeated the Treviri, and reduced them to submission. He took a distinguished part in the great campaign against Vercingetorix in 52, and thought himself not inferior in military ability to Cæsar. On the outbreak of the civil war in 49 he went over to Pompey, but distinguished himself little, except for boastfulness and cruelty. He murdered the soldiers of Cæsar who fell into his hands at Dyrrhachium. After the defeat at Pharsalia he fled, through Corcyra and Cyrene, to the remnant of Pompey's army in Africa. In 46 he commanded an army which was repulsed by Cæsar near Ruspina, after which he served as lieutenant of Scipio. After the defeat at Thapsus he fled to Spain. In 45 he again fought against Cæsar at Munda; his cautious attempt to cover his camp, being mistaken for a retreat, produced a panic, and turned the undecided battle into a rout, in which he fell. He was an able lieutenant, but too vain and headstrong to command.

**LA BILLARDIÈRE, Jacques Julien Houton de**, a French naturalist, born in Alençon, Oct. 23, 1755, died in Paris, Jan. 8, 1834. In 1786 he was sent on a scientific mission to Syria and Palestine, explored the mountains of Lebanon, and brought back a valuable collection of plants. The results of his journey were published in his *Icones Plantarum Syriæ rariorum Descriptionibus et Observationibus illus-*

*tratis* (4to, Paris, 1791-1812), with elegant drawings by Redouté. When the expedition under D'Entrecasteaux was sent in search of La Pérouse in 1791, La Billardièrre sailed on board the *Recherche* as naturalist, spent a few months at the Cape, visited many of the large islands and archipelagos in the Pacific ocean, and was finally taken prisoner at Java by the Dutch in October, 1793. His botanical collections, consisting of 4,000 plants, three fourths of which were of species previously unknown, were carried to England; but when, after a captivity of nearly two years, he returned to his native country, they were returned to him. In 1800 he was elected a member of the academy of sciences, and thenceforth devoted his whole time to arranging his botanical treasures and publishing the results of his observations.

**LABLACHE, Luigi**, an Italian singer, born in Naples, Dec. 6, 1794, died there, Jan. 23, 1858. He was the son of a French merchant, and studied vocal and instrumental music in one of the conservatories of Naples. He was idle and unruly, but was compelled to finish his studies, and made his début in 1812 at the little theatre of San Carlino as a buffo singer. In 1817 he appeared at the Scala theatre in Milan in Rossini's *Cenerentola*, with such success that Mercadante wrote for him the opera of *Elisa e Claudio*, and for several seasons he filled the leading basso parts in that city. In 1824 he sang for the first time before the Viennese, who in their enthusiasm caused a medal to be struck in his honor. After an absence of 12 years Lablache returned to Naples to assume the duties of royal chapelmaster and fill an engagement at the San Carlo theatre, and appeared in the works of Rossini and Bellini. In 1830 he went to Paris and London, where, in the maturity of his powers, he made his début at the Italian opera in the character of Geronimo in *Il matrimonio segreto*. Thenceforth until within a short time of his death, with the exception of the year 1834, when he returned to Naples to sing in the *Elisir d'amore*, he appeared chiefly in Paris and London. During the last 25 years of his life he was the leading basso of his own and perhaps of any other time. His voice, a base of the purest quality, unsurpassed in resonance, in flexibility and compass, was not less remarkable than his artistic skill in the management of it, and his dramatic versatility. Originally of an imposing and graceful presence, he became exceedingly corpulent in middle life, although this never detracted from the impressiveness of his performance in serious parts. He was at one time singing master of the queen of England. His only daughter was married to Thalberg.

**LA BLANCHÈRE, Pierre René Marie Henri Moulin de**, a French naturalist and photographer, born at La Flèche, Sarthe, May 2, 1821. After studying the natural sciences, he established himself in Paris in 1855 as a photographer, with a view of applying that art to scientific purposes. He was president during five years

of the *société du progrès de l'art industriel*, and superintended its semi-annual exhibitions in the Champs Elysées. At a later period he was commissioned by the government to execute photographic illustrations of the various types of French fishes and of the management of the piscicultural establishments at Hünningen and Concarneau; and these he collected in an album, which attracted much attention at the exhibition of 1867. His principal works are: *Répertoire encyclopédique de photographie* (a periodical, 6 vols., 1862-'7); *Nouveau dictionnaire général des pêches* (4to, illustrated); *Les ravageurs des forêts* (1865); *La pêche aux bains de mer*, and *Voyage au fond de la mer* (1868).

**LABORDE, Henri**, viscount de, a French painter, born in Rennes, May 2, 1811. He is a son of Gen. Count Henri François de Laborde (1764-1833). He studied under Delaroche, and produced in 1836 "Hagar in the Wilderness," which is at the museum of Dijon, and in 1837 "The Confession of St. Augustine," one of his best works, which has been purchased by the government. His "Capture of Damietta" (1841) and "Knights of St. John of Jerusalem" (1845) are at Versailles. His "Dante at La Verna" (1847), a historical landscape, for which he received a first medal, was burned in 1870, during the bombardment of Saint Cloud. He has published *Études sur les beaux-arts en France et à l'étranger* (2 vols., Paris, 1864), and *Ingres, sa vie et sa doctrine* (1870).

**LABORDE, Jean Benjamin de**, a French composer, born in Paris, Sept. 5, 1734, guillotined July 22, 1794. While young he became a favorite of Louis XV., and dissipated nearly the whole of his fortune; but he cultivated his taste for music, and during the life of his patron produced several successful operas. He published *Essai sur la musique ancienne et moderne* (4 vols., 1780), and several works on history, chronology, and geography. At the breaking out of the revolution he became obnoxious in consequence of being one of the farmers general, and retired to Rouen, but was brought back to Paris, and executed.

**LABORDE. I. Jean Joseph**, marquis de, a French financier, born at Jaca, Aragon, in 1724, guillotined in Paris, April 18, 1794. He amassed a large fortune in mercantile operations, and rendered important financial assistance to the government, for which he was made court banker and a marquis. When the French took part in the American war, he furnished the king with the money for despatching the troops. He was a friend of Voltaire, whose affairs he managed gratuitously. Toward the end of 1793 he was arrested, and, after a few months' imprisonment, sentenced to death by the revolutionary tribunal, as having participated in the royalist plots for the subversion of the republic. **II. Alexandre Louis Joseph**, count de, son of the preceding, a French archæologist and politician, born in Paris, Sept. 15, 1774, died there, Oct. 24, 1842. He was sent to Vienna at the beginning of the

revolution, entered the Austrian army, reached the rank of major, and returned to France after the treaty of Campo Formio (1797). He then devoted himself to travels and artistic pursuits. In 1800 he accompanied Lucien Bonaparte, ambassador to Spain, and during nearly two years explored the provinces of the peninsula, in company with several artists, whose expenses he paid. On his return to France he undertook the publication of his great work, *Voyage pittoresque et historique de l'Espagne* (4 vols. large fol., 1807-'18), which cost him the better part of his fortune. He afterward held several offices, and was a member of the chamber of deputies for most of the time from 1822 to 1840. He took an active part in the revolution of 1830, and was for some time prefect of the Seine, and afterward aide-de-camp to Louis Philippe. Besides the *Voyage de l'Espagne*, he published *Itinéraire descriptif de l'Espagne* (5 vols. 8vo, with an atlas, 1809); *Les monuments de la France, classés chronologiquement*, &c. (fol., 1816-'26); *Voyage pittoresque en Autriche, avec un précis de la guerre entre la France et l'Autriche*, 1809 (3 vols. fol., 1821-'3), &c. **III. Léon Emmanuel Simon Joseph**, count de, a French archæologist, son of the preceding, born in Paris in June, 1807, died there, March 30, 1869. He studied at Göttingen, travelled in the East, and on his return published, in conjunction with M. Linant, *Voyage de l'Arabie Pétrée* (Paris, 1830-'33), and *Flore de l'Arabie Pétrée* (4to, 1833). In 1837 he began a large and splendid publication, *Voyage en Orient*, consisting of travels in Asia Minor and Syria, which was published in parts and finished in 1862. In 1842 his *Commentaire géographique sur l'Exode et les Nombres* secured his election to the academy of inscriptions. In 1841 he entered the chamber of deputies, where he showed little interest in political questions. In 1845-'7 he published a series of letters on public libraries, the fourth of which, on the Mazarin palace, is full of historical interest. This led him to a larger illustrated publication, *Les anciens monuments de Paris*; the first part was published in 4to in 1846, but it was not continued. He was also the author of the following unfinished works: *Les ducs de Bourgogne, études sur les lettres, les arts et l'industrie pendant le 15<sup>e</sup> siècle* (2 vols. 8vo, 1849-'51); *La renaissance des arts à la cour de France* (vol. i., *Peinture*, 1855); and *De l'union des arts et de l'industrie* (2 vols. 8vo, 1856). He was for several years curator of the antiquities in the Louvre, but resigned in 1854, and in 1857 was appointed director of the archives of the empire. In 1867 he founded the museum of archives in the hôtel de Soubise.

**LABOUCHERE. I. Henry**, Baron Taunton, an English statesman, born in London, Aug. 15, 1798, died July 13, 1869. His father, Peter Cæsar Labouchere, whose ancestors left France at the period of the revocation of the edict of Nantes and became established in Holland, was a partner in the banking house of Hope



and co. of Amsterdam, and settled in England, where he married a daughter of Sir Francis Baring. The son was educated at Oxford, and in 1826 entered parliament as member for St. Michael's. About the same time he visited America, to study the operation of republican institutions, which confirmed his liberal opinions, and he was long recognized as one of the most prominent leaders of the British liberal party. He sat for St. Michael's till 1830, when he was returned for Taunton, retaining this seat by successive reelections till 1859, when he was raised to the peerage. From 1832 to 1834 he was one of the lords of the admiralty, and from 1835 to 1839 vice president of the board of trade, master of the mint, and privy councillor. He was chief secretary for Ireland from 1846 to 1847, president of the board of trade from 1847 to 1852, and from 1855 to 1858 secretary of state for the colonies. As he had no male heir, his title became extinct at his death. **II. Henry Du Pré**, an English politician, nephew of the preceding, born in London in 1831. He was in the diplomatic service from 1854 to 1864, and was a liberal member of parliament from July, 1865, to April, 1866, and from April, 1867, to November, 1868. During the siege of Paris he was correspondent of the London "Daily News," and his letters were published as the "Diary of a Besieged Resident in Paris" (London, 1871).

**LABOUCHERE, Pierre Antoine**, a French painter, born in Nantes about 1818. He completed his studies under Delaroche, and became known as a historical painter, most of his works relating to Luther, Ulrich von Hutten, Melancthon, and Erasmus. Among the more recent ones are "The Death of Luther" and "Charles V." (1866).

**LA BOUÈRE, Antoine Xavier Gabriel de Gazean**, count de, a French painter, born at La Bouère, department of Maine-et-Loire, Oct. 1, 1801. He is a son of a Vendean general of the same name, and was aide-de-camp in Spain in 1823, and in Algeria in 1830. Subsequently he studied painting, and exhibited many pictures under the name of Tancrede de La Bouère, including "Views of Algiers," "Ruins of Thebes," "The Desert of Suez," "The Valley of Tombs in Nubia," "Ruins of Karnak," "The Pontine Marshes," and others, which are in the Luxembourg and some provincial galleries, and the museum at Copenhagen. His "Views of the Alhambra" have been purchased by the government.

**LABOULAYE. I. Édouard René Lefebvre**, a French author, born in Paris, Jan. 18, 1811. He studied law, and became known first by his *Histoire du droit de propriété foncière en Europe depuis Constantin jusqu'à nos jours* (8vo, Paris, 1839). In 1842 he published *Essai sur la vie et les doctrines de Frédéric Charles de Savigny*, and the same year he became an advocate of the royal court of Paris. Two other elaborate works followed, *Recherches sur la condition civile et politique des femmes, de-*

*puis les Romains jusqu'à nos jours* (1843), and *Essai sur les lois criminelles des Romains concernant la responsabilité des magistrats* (1845). In 1845 he was elected a member of the academy of inscriptions, and in 1849 he became professor of comparative legislation in the collège de France. Under the empire Laboulaye took part in various attempts of the liberal party to direct public opinion, and was several times an unsuccessful candidate for the corps législatif. A firm friend of the United States and of republican institutions, he took a deep interest in our civil war, and publicly expressed his sympathy, both in his writings and his speeches, with the federal government. In 1870 he was a member of the commission of inquiry into the administrative organization of the city of Paris and of the department of the Seine, and some weeks before the *plébiscite* of Napoleon he publicly advocated the necessity of an affirmative vote. In July, 1871, he was elected to the national assembly, and was made president of the commission for the reorganization of superior instruction. In March, 1873, he was appointed director of the collège de France. Among his works not already mentioned are: *Histoire politique des États-Unis, 1620-1789* (3 vols. 8vo, 1855-'66); *Les États-Unis et la France* (1862); *L'État et ses limites* (1863); *Paris en Amérique* (18mo, 1863); *Les mémoires et la correspondance de Franklin* (1866); and *Lettres politiques* (1872). He has published also a number of tales and translations, and contributed numerous articles to the leading periodicals. **II. Charles Pierre Lefebvre**, a French industrialist, brother of the preceding, born in Paris in 1813. He entered the army as lieutenant of artillery, but resigned in 1836 and devoted himself to the industrial arts. He turned his attention specially to the founding of metallic type, and he is the inventor of many ingenious and valuable processes and machines for type making. He was also the editor and principal writer of the *Dictionnaire des arts et manufactures* (2 vols. 8vo, 1847; 3d ed., 1867), and the author of a number of valuable treatises on mechanics, industrial art, the mechanical equivalent of heat, &c.

**LABOURDONNAIS, or Labourdonnaie, Bertrand François Mahé de**, a French naval officer, born in St. Malo, Feb. 11, 1699, died about 1755. He entered the service of the French East India company as a lieutenant in 1718, and became a captain in 1724. In 1734 he was appointed director general of the isles of France and Bourbon. These colonies, which he found in a state of anarchy, grew rapidly in prosperity under his government, and became the depots of commerce between Europe and the Indies. He built fortifications, aqueducts, quays, canals, hospitals, and ship yards, and introduced the culture of manioc, sugar, indigo, and cotton. In 1746, during the war between England and France, he improvised a fleet, dispersed the squadron of Admiral Barnet before Madras, and bombarded the city, which sur-



rendered on Sept. 21. The French ministry had given orders that no attempt should be made to hold any of the English possessions that were captured, and the victor agreed to accept a ransom for the city of 1,100,000 pagodas (about 9,500,000 francs); but Duplex, governor general of the French Indies, jealous of Labourdonnais, refused to ratify his act. Labourdonnais was obliged by a storm to put to sea, and Duplex, declaring void the articles of capitulation signed by him, removed all English property to Pondicherry, and burned the city. Labourdonnais, on his return to the isle of France, found a successor installed in his place by Duplex. Returning home, he hoped there to receive justice; but three days after his arrival in Paris, on the night of March 2, 1748, he was seized and thrown into the Bastille, where he lay for three years and a half, ignorant of his accusation and not permitted to communicate even with his family. In 1751 a commission appointed by the council of state pronounced him innocent of all the charges brought against him, and gave him his liberty; but his spirit was broken, and his existence during his last years was embittered by poverty and suffering. The government afterward, recognizing the injustice done him, gave his widow a pension of 2,400 livres. In 1859 a statue was erected to him in the isle of Bourbon (now Réunion). His life was written by his grandson, the actor Bertrand François Mahé (8vo, Paris, 1827).

**LABRADOR**, a peninsula of British North America, on the Atlantic coast, between lat. 49° and 63° N., and lon. 56° and 79° W., comprising in its fullest sense all that territory bounded N. E. and E. by Hudson strait and the Atlantic ocean, S. E. and S. by the strait of Belle Isle (separating it from Newfoundland), the gulf of St. Lawrence, and the river St. Lawrence, S. W. by the Betsiamites or Bersimis river, Lake Mistassini, and Rupert's river, and W. by Hudson bay; extreme length E. and W. from the E. entrance of the strait of Belle Isle, 950 m.; extreme breadth on the 75th meridian, 750 m.; area, about 450,000 sq. m. The E. portion (area about 125,000 sq. m.), from Cape Chudleigh (lat. 60° 37', lon. 65°) at the E. entrance of Hudson strait to the harbor of Blanc Sablon (lat. 51° 25', lon. 57° 9') at the W. entrance of the strait of Belle Isle, embracing the region draining into the Atlantic, belongs to Newfoundland; the remainder forms part of the Dominion of Canada. The portion (area 53,500 sq. m.) immediately W. of a line drawn N. and S. from Blanc Sablon to the 52d parallel, embracing the region draining into the river and gulf of St. Lawrence, forms part of Saguenay co., Quebec; the residue (much the larger part of the peninsula), comprising the N. and W. portions, which drain into Hudson bay and strait, is included in the Northwest territories. In a restricted sense, Labrador includes only the coast washed by the Atlantic. The set-

tled population of the portion belonging to Newfoundland in 1869 was 2,479, of whom 1,803 belonged to the church of England, 483 were Roman Catholics, 165 Wesleyans, and 28 belonged to the Kirk of Scotland. The Quebec portion in 1871 had 3,597 permanent residents, of whom 1,779 were of French origin or descent, and 1,309 Indians (Montagnais). The settlements are scattered along the shore of the St. Lawrence E. through the strait of Belle Isle to Cape Webuck, just N. of Hamilton inlet. W. of the St. Augustine river French is commonly spoken; E. of that point, including the Newfoundland settlements, English is the ordinary language. The chief occupations are fishing in summer, and hunting and trapping fur-bearing animals in winter. There are a few widely separated posts of the Hudson bay company, chiefly near the shores of Hudson bay and strait. In the interior are wandering bands of Nasquapee, Mistassini, and Montagnais Indians, numbering 4,000 or 5,000. The coast N. of Hamilton inlet is occupied by Esquimaux to the number of about 1,500, of whom 1,200 are under the control of the Moravian missionaries, who have four stations here, viz.: Nain (about lat. 56° 30'), founded in 1771; Okkak (lat. 57° 30'), 1776; Hopedale (lat. 55° 40'), 1782; and Hebron (lat. 58°), 1830. Each has a church, store, dwelling for the missionaries, and workshops for the natives. A vessel annually visits Nain from Europe, to bring supplies and carry back the furs and other products collected by the natives. The English church has missions in the settlements subject to Newfoundland, and in 1853 a church was consecrated at St. Francis harbor. Roman Catholic missions have long existed W. of the strait of Belle Isle.—The coasts of Labrador are rugged and forbidding. The chief indentation on the Atlantic is Esquimaux bay or Hamilton inlet (about lat. 54°), into the head of which falls the Ashwanipi or Hamilton, the largest river of Labrador, and the outlet of a lake of the same name. The principal streams emptying into Hudson bay, commencing at the south, are Rupert's river, the outlet of Lake Mistassini, the East Main or Slude river, and the Great and Little Whale. Into Ungava bay, an inlet of Hudson strait, flow the Koksoak or Koniapuscauw and Whale rivers, while the Nasquapee or Northwest river and the Kenamou fall into Hamilton inlet on either side of the Ashwanipi, the former from the north and the latter from the south. Proceeding up the St. Lawrence, the chief rivers that empty into the gulf and river are the St. Augustine, Natashquan, Mingan, St. John, Magpie, Trout, Moisie, and Betsiamites. There are many lakes, formed chiefly by expansions of the rivers. The interior of the country, according to Prof. Hind, is a lofty table land, in many parts thickly strewn with boulders, and everywhere bleak and sterile. Where the surface is not burned, caribou moss covers the rocks, and stunted spruces, birches,

and aspens grow in the hollows. The highest mountains extend along the E. coast from lat. 54° to 59°. Mount Thoresby near the coast is 2,730 ft. high. The prevailing geological formation on the seaboard is granite, gneiss, or mica slate, above which in some places are beds of old red sandstone about 200 ft. thick, and a stratum of secondary limestone. Toward the interior the secondary rocks disappear. At Cape Château a series of basaltic columns presents a remarkable resemblance to an ancient castle. Very little is known of the mineral resources, but iron ore, limestone, granite, hornblende, lapis olaris, hematite, and the beautiful shining spar called labradorite are found, the last being collected by the Esquimaux on the seacoast and the shores of the lakes. In the south a stunted growth of poplars, pines, birch, and willow is found, and grass clothes the valleys for a few weeks in summer. Little vegetation exists in the north excepting mosses and lichens, though in some few favored spots the aspect is better. No kind of grain will ripen, but potatoes, Dutch turnips, cabbages, and other hardy vegetables come to perfection. Much rain falls in summer near the sea. Sometimes on the coast the thermometer in July indicates 86°, but a short distance inland it is at all times more temperate. The winters are extremely cold. From December to June the sea is frozen, while on land travelling becomes almost impossible. The mean temperature of the respective months at the missionary stations of Okkak and Nain is: in January, 1°55'; February, 2°73'; March, 7°88'; April, 29°48'; May, 27°24'; June, 42°59'; July, 50°91'; August, 51°99'; September, 44°71'; October, 32°56'; November, 24°45'; December, 27°84'. The mean annual temperature at Nain is stated at 22°52'; at Okkak, 27°86'; at Hopedale, 27°82'. The prevailing winds on the E. coast vary between W. S. W. and N. W. There is less fog than on the island of Newfoundland, and the strait of Belle Isle is never frozen. The aurora borealis is frequent and of extreme brilliancy. The rivers abound with salmon, and the lakes with pike, barbel, eels, and trout; the wilds with reindeer, black and white bears, wolves, foxes, hares, mountain cats, martens, and otters, with a few ermines, porcupines, and beaver; the birds are white grouse, ptarmigan, spruce game, gray plover, a great variety of water fowl, the white-tailed eagle, and several varieties of hawks. Mosquitoes are as abundant as in more southern climates. Dogs and reindeer are the only domesticated animals, both being used as beasts of draught.—The main wealth of Labrador is in its fisheries, in which, besides the settlers on the coast, a large number of schooners from Newfoundland, the Canadian provinces, and the United States (citizens of which by treaty have the right to take and cure fish on the shore E. of Mount Joly, lon. 61°40', near the mouth of the St. Lawrence river) are engaged, employing during the fish-

ing season probably 30,000 men. According to official reports, the exports from the Labrador coast subject to Newfoundland in 1873 were valued at \$1,132,935, the chief items being 303,208 quintals of codfish, 4,536 gallons of seal oil, 31,004 of cod oil, 1,467 tierces of salmon, and 43,413 barrels of herring. The value of the fisheries of the Quebec portion for the year ending June 30, 1873, was \$518,140, the chief items of catch being 92,800 quintals of codfish, 8,146 barrels of herring, salmon to the value of \$41,135, 7,225 seals, 26,975 gallons of seal oil, 400 of whale oil, and 23,283 of cod oil. These figures do not include large quantities of fish taken to St. John's, Harbor Grace, and other Newfoundland ports, and thence exported to foreign countries, nor the catch of American and Nova Scotian fishermen. It is estimated that the total annual value of the fisheries on the Labrador coast is more than \$5,000,000. The shores and adjacent islets are also resorted to for sea-fowl eggs.—Labrador was discovered by John Cabot in 1497. His son, Sebastian Cabot, who accompanied him in that voyage, subsequently again visited the coast, and entered and partly surveyed Hudson bay, giving names to several places. Henry Hudson explored the coast in 1610, after his discovery of the river which bears his name, passed through the strait now called Hudson strait, and entered the great bay, to which also he gave his name. The Portuguese called the country *Terra Laborador*, or cultivable land, a misnomer equal to that of Greenland. About the middle of the last century a settlement was formed on the coast by Mr. Darby, an American, for the purpose of establishing a whaling station and civilizing the Esquimaux; but the Indians made a descent on it, murdered many of his men, and broke it up.—See "A Journal of Transactions and Events during a Residence of nearly Sixteen Years on the Coast of Labrador," by G. Cartwright (3 vols., Newark, Eng., 1792); and "Explorations in the Interior of the Labrador Peninsula," by Henry Youle Hind (2 vols., London, 1863).

#### LABRADORITE. See FELDSPAR.

**LABRADOR TEA** (*ledum latifolium*), an interesting low evergreen shrub belonging to the heath family, and to the same suborder with the kalmia, the rhododendron, and the azalea. It is found in moist places, from Pennsylvania northward, especially in cold sphagnum swamps, its much-branching stems spreading in every direction through the damp moss. Its alternate short-petioled leaves are light green above, revolute at the margin, and the under surface is clothed with a dense down or rather wool, which in the older leaves is of a rusty brown color, a character by which the plant may be readily recognized; the leaves when crushed are fragrant. The flowers are in crowded terminal corymbs, white with distinct petals, forming an exception to the rule in this family, in which the flowers are mostly monopetalous. The common name has reference to

the use made of the leaves as a substitute for tea by the inhabitants of Labrador. It is found in the northern parts of Europe also, and the leaves are said to be used in Russia for tanning leather, and as a substitute for hops in brewing. The leaves of this and the only other species, *L. palustre*, are said to possess narcotic properties. The writer has found the plant to succeed in cultivation in a soil largely composed of peat.

**LABROUSTE, Pierre François Henri**, a French architect, born in Paris, May 11, 1801. He studied at the collège Ste. Barbe and afterward under Léon Vaudoyer and Hippolyte Lebas, entered the school of fine arts in 1819, and took the grand prize in 1824. In 1843 he began the construction of the new library of Ste. Geneviève, his most noted work and the best existing example of the romantic or neo-Greek style, of which he was one of the founders and the most distinguished master. Among his other works are the hospital of Lausanne, the prison of Alexandria, and the school of Ste. Barbe des Champs.

**LA BRUYÈRE, Jean de**, a French moralist, born in Paris about 1644, died in Versailles, May 11, 1696. At the recommendation of Bossuet he was appointed teacher of history to the grandson of the great Condé, in whose service he remained for the rest of his life in a literary capacity, with a pension of 1,000 crowns. He was admitted a member of the French academy in 1693, and left the reputation of a genial philosopher, whose happiness consisted in cultivating the best society and in reading the choicest books. His power of observation and his literary attainments are attested by his celebrated *Caractères, ou les Mœurs de ce siècle*, founded upon the "Characters" of Theophrastus, which he translated into French and prefixed to his own. Hallam says that he incomparably surpassed his Greek model. The first edition appeared in the beginning of 1688. Three editions were exhausted in the first year of its publication, and six more before the author's death. La Bruyère left also an unfinished work, published in 1699 under the title of *Dialogues posthumes sur le quiétisme*, and contained in an edition of the works of La Bruyère, La Rochefoucauld, and Vauvenargues (Paris, 1820). Many editions of La Bruyère's "Characters" were published after his death in Holland and France. The first complete edition based upon the original work was prepared by Walckenaër (Paris, 1845), followed by an improved edition by Destailleur (1855), and an edition by Gennequin the elder with illustrations (1858). Many have since appeared, the latest being that by Alphonse Lemerre (1872). The English translation by the poet Rowe (London, 1709) has been often reprinted. In 1861 a new edition of his works was published (12mo, Caen), with notes by Georges Mancel.—See *La comédie de La Bruyère*, by Édouard Fournier (Paris, 1866), and *Caractères de La Bruyère*, in

Lemerre's edition of French classics, with a sketch and notes by Ch. Asselineau (1872).

**LABUAN**, a British island in the Malay archipelago, off the N. W. coast of Borneo, in lat. 5° 22' N., lon. 115° 10' E.; area, 45 sq. m.; pop. in 1871, 4,893. The chief settlement is at Victoria at the S. E. end, where there is a government establishment and a fair harbor. In the interior are swampy tracts of jungle. The island is well supplied with water, and good coal is found near the N. E. end. In 1866 about 12,000 tons were mined. Petroleum also is found, and ironstone and freestone are quarried. A railway has been built from the mines to the place of shipment, 5 m. distant, and several new roads have been opened. The chief exports are coal, sago, birds' nests, pearls, and camphor. The exports in 1872 amounted to £134,984 (including £65,890 re-exports); imports, £129,198; total tonnage (exclusive of numerous native craft) entered, 7,708 tons; cleared, 7,808 tons. The colony was created an episcopal see in 1855. The island was ceded to Great Britain in 1846 by the sultan of Brunai, through the influence of Sir James Brooke, the rajah of Sarawak.

**LABURNUM**, the ancient Latin name as well as the popular one for a small, hardy, deciduous tree of the family *leguminosae*. It was formerly placed in the genus *cytisus*, and is found in most works as *C. laburnum*; but some important characters separate it from *cytisus*, and it stands in recent works as *laburnum vulgare*. The common laburnum was introduced from Switzerland into Great Britain near the close of the 16th century, and is now largely cultivated as an ornamental tree. It has a smooth



Laburnum.

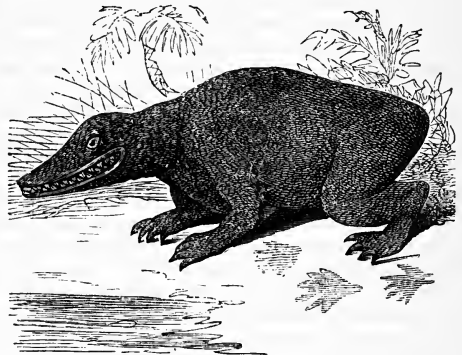
green bark, pale green three-foliolate leaves, and in May and June presents a beautiful appearance, every twig and small branch being hung with racemes of brilliant yellow flowers, which are long and pendulous, and suggested one of its common names, golden chain; in

Europe it is also called bean trefoil. Its hard and heavy wood is largely used for ornamental work, and for handles to knives and other instruments; it takes a high polish, and has a greenish color; the French call it the ebony of the Alps. Rabbits are so fond of its bark, that they eat it in preference to that of any other tree. The seeds are highly emetic, and may be regarded as poisonous, and their great profusion and brilliant appearance render it somewhat objectionable to cultivate the tree, from the danger of children or cattle being tempted to eat them. A hybrid (probably a graft hybrid) between this and a purple-flowered species obtained by a French horticulturist, M. Adam, is known as Adam's laburnum. Its flowers, which are of a dull purple color, frequently revert to one or the other parent; and the same branch, and even the same cluster, bears pure yellow and purple flowers of the parent species, as well as the dull purple ones of the hybrid. The alpine or Scotch laburnum (*L. alpinum*) attains a greater size than the one already described; it is a native of southern Europe, and cultivated forms of the two are so much alike that it is probable they are not specifically distinct.

**LABYRINTH**, a structure of intricate passages which it is impossible to traverse without a clue. Three labyrinths are mentioned in ancient story. The best authenticated is the labyrinth of Egypt, situated at Arsinoë, near Lake Mœris. Herodotus visited and describes it. It consisted of 3,000 chambers, half of them below ground, the subterranean apartments being sacred burial places. It was extant in Pliny's time. Ruins at the modern village of Howara in Fayoom have been identified by Lepsius with those of the labyrinth. Another structure, on a smaller scale but on the model of that of Egypt, was reported to have been built near Cnossus in Crete, by Dædalus, as a place of confinement for the fabled monster the Minotaur; but antiquaries discover nothing more labyrinthine in that locality than the caves and quarries of Mt. Ida. A third labyrinth was in the isle of Lemnos; remains of it were extant in the time of Pliny, but none can now be traced. A similar structure was said to exist on the island of Samos, and another, called the labyrinthine tomb of Lars Porsena, near Clusium, in Etruria; but no particulars are known of either, and their existence at any time is doubted.

**LABYRINTHODON** (Gr. *λαβύρινθος*, labyrinth, and *ὄδον*, a tooth), a gigantic fossil reptile, so named by Prof. Owen from the complex labyrinthine structure of the teeth; the same animal had been previously called *cheirotherium* by Kaup, from the resemblance of its tracks to impressions of the human hand. This animal, which possesses both saurian and batrachian characters, probably most nearly resembled a gigantic frog about 10 or 12 ft. long. A historical sketch of the discoveries in connection with this reptile may be found in the "Pro-

ceedings of the Boston Society of Natural History" (vol. v., 1856, p. 298), and full details on its affinities in the "Annals and Magazine of Natural History" (vol. viii., London, 1852, pp. 305-313). Footprints and bones of the labyrinthodon have been found in the trias of England and Germany; from an examination of the head and teeth, vertebræ, pelvis, and bones of the extremities, Prof. Owen constructed an animal intermediate between the crocodile and the frog. Pictet (*Traité de paléontologie*, 1853) calls it *mastodontosaurus*, and considers it a saurian from the presence of scutes on the skin and the form of the teeth. The general shape of the head is frog-like, as also are the double occipital condyles, narrow palatal processes of the maxillary, the roof of the mouth, the row of small teeth across the anterior part of the palate and a longitudinal row on the palate concentric with the maxillary teeth, the lower jaw and the vertebræ, and bones of the fore limbs; on the other hand, the facial and nasal parts of the skull are crocodilian, as are the maxillary tusks, the strong transverse pro-



Labyrinthodon (restored).

cesses for ribs, bony dermal plates, &c. In some of the dental characters it resembles fishes. The size of the tracks varies from 4 to 12 in. in length, with five toes on each, one turned in like the human thumb; the hind foot was three or four times as large as the fore foot; there is no positive evidence that the animal had a tail; its progression seems to have been slow and awkward, the legs having been swung outward like the course of a scythe. Near each large step, and  $1\frac{1}{2}$  in. before it, is a smaller one of the fore foot, the distance from pair to pair being about 14 in. The American cheirotherium made a double series of tracks, and evidently belonged to a different genus from that of Europe.

**LAC**, a resinous exudation from the twigs and branches of various kinds of trees in the East Indies, caused by the punctures of the insect *coccus ficus*, which swarms upon trees yielding a milky juice. The exuding juice forms an incrustation around the twigs, and in this the insects make the cells for containing their

eggs. Upon the outside the concrete resinous lumps are marked with numerous pores as if perforated with a needle; within are seen many oblong cells, which often contain dead insects. The substance is of a deep reddish brown, of shining fracture, astringent, and bitterish. It colors the saliva red, and produces a dye of this color but little inferior to the real cochineal. Indeed, before the discovery of the latter it was the material of the fine rich crimson dye of the ancients, and of the durable reds of the dyers of Brussels and Holland. The coloring matter is readily extracted by warm water; the lac itself is for the most part soluble in alcohol, also in an aqueous solution of borax, by which it may be distinguished from most common resins with which it is sometimes adulterated; when burned it diffuses a strong agreeable odor. The crude article broken off with the twigs is known as stick lac, and is sold by those who gather it at from 2 to 4 lbs. for a penny. When the stick lac is broken up and its coloring matter is partially removed by water, it is called from its granular appearance seed lac. This is sometimes melted into masses and called lump lac. The more familiar variety known as shell lac is prepared by melting the seed lac and straining it through fine linen bags, upon a flat, smooth surface of wood, to harden. It dries in thin sheets, which break up into small fragments. Their color is from orange to dark reddish brown; they are more or less transparent, hard, brittle, and shining. The substance is soluble in alcohol, but not in water, and possesses neither taste nor smell. It softens readily by heat, so that it has run together in masses when stowed in the hold of a ship. It contains, as found by Hatchett, 90.9 per cent. of resin and 0.5 of coloring matter; the remainder is wax, gluten, and foreign matter. Stick lac contains about 10 per cent. of coloring matter and 68 per cent. of resin. The coloring matter is separated by treatment with warm water and evaporation, and, made into square cakes, is known as lac dye, lac lake, or cake lake. When scraped they yield a bright red powder like carmine. A varnish and pigment combined is prepared from stick lac for the process of jappanning. The natives of India employ the substance in various ways. They color it with yellow orpiment and make it into bracelets, chains, and other ornaments in imitation of gold. They prepare with it a good varnish, which they color with cinnabar or some other pigment. The wheels of their lapidaries are covered with a preparation of lac, which by its adhesive nature retains the polishing powders. The chief uses of shell lac are for manufacturing sealing wax, and as the basis for spirit varnishes and the French polish. The best red sealing wax contains 48 parts in 100 of it, together with 19 parts of Venice turpentine, 1 of balsam of Peru, and 32 of finely powdered cinnabar. It forms 60 per cent. of the best black sealing wax, the other ingredients being 10 parts of turpentine and 30 of levigated

bone black. The coloring matter and some insoluble ingredients, which are never wholly removed from shell lac, injure it for a varnish for light-colored works; but recent methods of bleaching, one of which by chlorine was introduced by Dr. Hare, have in a great measure removed this difficulty. (See VARNISH.) The adhesive quality of lac adapts it for cements for broken porcelain, and united with caoutchouc it makes the famous marine glue. A weak solution of it in alcohol is recommended in surgery to be spread on bandages for dressing wounds and ulcers. Formerly it was used in medicine, but it has no specific action.—The best stick lac is brought from Siam, and next to this ranks that from Assam. In the best articles the sticks are frequently incrustated entirely around with the lac to the thickness of a quarter of an inch; and the substance also forms large oblong bunches of much greater thickness. The Bengal stick lac is commonly in very scanty and irregular incrustations. The capacity of production is said to be many times greater than the demand, though the annual exportations amount to several million pounds of lac dye and shell lac.

**LA CAILLE, Nicolas Louis de**, a French astronomer, born at Rumigny, near Rheims, March 15, 1713, died in Paris, March 21, 1762. He was a pupil of Cassini in the observatory of Paris, assisted Maraldi in the survey of the coast between Nantes and Bayonne, and afterward (1739-'40) took part in the measurement of the arc of the meridian, correcting the results of Picard, and proving the flattening of the earth toward the poles. Being appointed professor of mathematics in the Mazarin college, he published (1741-'50) lectures on mathematics, mechanics, astronomy, and optics, which have passed through many editions. He next devoted himself to astronomical observations, both at his observatory and at the Cape of Good Hope. His catalogue of stars made at the latter station excited especial surprise from the quickness and accuracy of its formation. By simultaneous observations made by himself at the Cape and by Lalande at Berlin, he established the distance of the moon and of the planets Mars and Venus. While there he received orders to survey the island of Bourbon and the isle of France (Mauritius). On his return he investigated anew the problem of finding the longitude at sea, and proposed the modern plan of a nautical almanac. In 1757 he published his *Astronomie Fundamentale*; in 1758, *Tables solaires*; and soon after, Bouguer's treatise *De la gradation de la lumière*, and a new edition of the *Nouveau traité de navigation* by the same author. After his death his friend Maraldi published his treatise on the "Southern Starry Heavens," and his "Voyage to the Cape." La Caille was the author of a large number of other treatises, chiefly on astronomical subjects.

**LACANDONES**, an Indian tribe of Central America, whose territory, formerly embracing



a large proportion of N. W. Guatemala, Chiapas, and perhaps Tabasco, along the banks of the river of their own name and of the Usumasinta, seems at present to be confined to the fastnesses of the Chiche mountains. Little is known, however, of the precise limits of their country, as it is comprised in an extensive region hitherto unexplored, extending from lat. 16° to 17° N., and from lon. 90° to 93° W., according to M. Morelet, who visited the region, and describes it in *Voyage dans l'Amérique Centrale* (Paris, 1869). The Lacandones, now intermingled with the once indomitable Choles and Manches, were formerly aggressive and cruel, and not only successfully resisted the Spanish arms, but by their frequent incursions materially retarded the prosperity of the surrounding European colonies. They are now shy and timid in their limited intercourse with the Spanish population, and even with the civilized aboriginal tribes, to whom they occasionally bring tobacco and sarsaparilla in exchange for manufactured goods and rude instruments of agriculture or warfare. They speak a dialect of the language of the Mayas of Yucatan, in all likelihood the parent stock from which their separation was coeval with and determined by the same causes as that of the Itzaes. (See ITZAES.) Although now subject to the laws of the republic of Guatemala, they preserve the habits and religion of their forefathers, and their territory remains in its primitive condition. There is no reason for believing that they possess large cities and towns, with great temples glistening like silver in the sun, such as the cura of Quiché affirmed to Mr. Stephens that he had seen with his own eyes from the tops of the mountains of Quezaltenango.

**LACCADIVE ISLES** (Sanskrit, *lakke*, hundred thousand, and *dive*, island), a group of small islands in the Indian ocean, consisting of 20 clusters, 100 m. off the Malabar coast, between lat. 10° and 12° 40' N., and lon. 72° and 74° E.; area, 744 sq. m.; pop. 6,800. They are dependencies of British India. The principal are Underoot, Cabarita Akhalu, Kalpeni, Kaltair, Cheltac, Kerdmut, Ameni, Corrittee, and Minicoy. They are all of coral formation. The largest is but 7 m. long, and many of them are barren uninhabited rocks. From the dangerous reefs around them they are seldom visited by navigators, and during the S. W. monsoon all intercourse with the mainland is cut off. The harbor most frequently called at for supplies is Kan-Rattea, lat. 10° 34' N., lon. 72° 56' E. The islands are not fertile, excepting in cocoa-palms, the fruit of which forms the principal food of the inhabitants, and its fibre or coir one of the chief articles of commerce. The other products are rice, in small quantities, sweet potatoes, plantains, and betel nuts. Cows are the only quadrupeds on the islands, and they are few and of small size. The sea abounds in fish and turtles. The natives are an inoffensive race, of Arabian origin, who profess a kind of Mohammedanism, and are

called Moplays. Their dwellings are of stone, thatched. The Laccadives were discovered by Vasco da Gama in 1499.

**LACE**, a fabric of threads of cotton, linen, flax, silk, gold, or silver, interwoven to form a delicate plain or ornamental network. According to some authorities, lace was in use among the Egyptians and the Greeks and Romans. Mrs. Palliser and others suppose the articles referred to as lace in the Old Testament, and other early works, to have been elaborate needlework or embroidery, and that lace was not made until a later period. The invention of lace is claimed both by Italy and Flanders. While it is difficult to determine in which country the manufacture had its origin, it appears that lace was made in both as early as the 15th century. Italian lace is supposed to be referred to in an account dated 1469, and preserved in the municipal archives of Ferrara, while bone and bobbin lace are unmistakably mentioned in a document dated 1493. At a very early period the laces of Venice, Milan, and Genoa were the best known in the commercial world. The "Venice point" lace, wonderful for delicate texture and elaborate design, became specially famous. In England it was highly prized and in general use in the reign of Elizabeth, and it found its way into France about the same period. Toward the latter part of the 18th century the manufacture began to decline, and it has since become extinct. Flemish pictures of the 15th century represent persons adorned with lace, and a Belgian writer asserts that lace cornettes or caps were worn in that country as early as the 14th century. The invention of pillow lace has been claimed for Barbara Uttmann, who in 1561, having obtained aid from Flanders, began to make laces of various patterns at Annaberg, Saxony; but it is asserted by other authorities that she only introduced the manufacture into Germany at that date, as contemporaneous paintings bear evidence to the existence of the art in Flanders more than half a century before. The lace manufacture of the Netherlands increased with remarkable rapidity, and in the 16th century was a source of great wealth to the country. The article produced was of great beauty; the old Flemish laces, the Brussels point and the Mechlin, rivalled the best of the Italian. Every country of northern Europe, France (excepting Alençon), Germany, and England learned the art of lace making from Flanders. Prior to 1665 this industry seems to have been of little importance in France. The lace made was of coarse and inferior quality, and was in little demand compared with the artistic productions of Italy and Flanders, for which enormous sums were annually spent. Nor did the prohibitions against these foreign luxuries develop the native manufacture. In 1666 the manufacture of lace was established at Alençon by Colbert, who had secured from Venice 30 women skilled in the art. Through the aid of



Louis XIV. a great demand was created for this lace, which became known as the point de France and afterward as the point d'Alençon. But its high price limited its use to the rich, who now bought this instead of the Venetian laces. After the success of this enterprise, lace fabrics were established in various parts of France, and the number of lace-workers increased with great rapidity. At the beginning of the 18th century the annual production of lace in France was estimated at 8,000,000 francs. The celebrity of Spanish point lace in early times was scarcely less than that of the Flemish or Italian; but the manufacture has declined. Little is known concerning the origin of the manufacture of lace in Great Britain; but as the importation of this article was prohibited in 1483, it is presumed that the manufacture existed at that time. In 1640 lace making was a flourishing industry in Buckinghamshire, and in the 17th and 18th centuries it extended over a larger area than at present.—Lace consists of two parts, the ground and the flower pattern, or "gimp." In some cases, however, the design is not worked upon a ground, but the different parts are connected with threads. The flower or other ornamental pattern may be made together with the ground, as in Valenciennes or Mechlin, or separately, and then worked in or sewn on (*appliqué*). Lace made by hand is divided into point and pillow. The former, termed needle point, *point à l'aiguille*, &c., is made with the needle on a parchment pattern. Point is also applied to lace produced by a particular stitch. Pillow lace is so termed from the pillow or cushion which for more than three centuries has been used in making lace. On this pillow is fixed a stiff piece of parchment, upon which the pattern is marked by means of small holes pricked in it, through which pins are stuck into the cushion. The threads for the lace are wound upon bobbins—formerly bones, whence the term bone lace. By the twisting and crossing of these threads around the pins, the ground of the lace is made; while the pattern or figure is formed by interweaving a thread thicker than that forming the groundwork, according to the design indicated on the parchment. The designs are prepared by persons who devote themselves to this branch, while their execution is intrusted generally to women. Sometimes as many as 12 of these are employed upon the same design or figure, each having a different portion to produce. *Guipure* is a term so extensively applied to lace that it is difficult to limit its meaning. It is, however, a lace without ground, the designs being joined by "brides," or large coarse stitches. The names of the different varieties of lace have been derived from the places where the manufacture originated or has been carried on with the greatest success. The most noted products are now those of Belgium, France, and England. In Belgium 150,000 women are said to be employed in lace making, the ma-

majority of whom work at home. Throughout the country there are nearly 900 lace schools, many of which are in the convents. One of the most important centres of this industry is Brussels. The thread used, which is made at Hal and Rebecq-Rognon, of flax grown in Brabant, is of extraordinary fineness. The finest quality is spun in dark underground rooms, to avoid the dry air, which causes the thread to break, and to secure the best light, which is done by admitting a single beam and directing it upon the work. It is the fineness of the thread, as well as the delicacy of the workmanship, which has given to the best Brussels lace such celebrity and rendered it so costly. It is often sold at \$1,200 a pound, and has been mentioned as high as \$2,500. In the old Brussels lace the design was worked in with the ground. The *appliqué* lace is now extensively produced, the designs being made on the pillow and afterward attached to the ground with the needle. Mechlin lace, which has been made at Mechlin, Antwerp, Lierre, and Turnhout, formerly had a wide celebrity; but the manufacture has long been on the decline, though it appears to have partially revived. This has been called the prettiest of laces. It is fine and transparent, and is best adapted to summer use, being most effective when worn over color. It is made in one piece on the pillow, with various fancy stitches introduced. Its distinguishing feature is the flat thread which forms the flower, and gives to this lace the character of embroidery; it is hence sometimes called *broderie de Malines*. The most important branch of the pillow-lace trade in Belgium is the manufacture of Valenciennes, which, having become extinct in its native city, has attained great prosperity in Flanders. This lace is now chiefly made at Ypres, Bruges, Courtrai, Menin, Ghent, and Alost. The productions of Ypres are of the finest quality and most elaborate workmanship. Valenciennes lace is made upon the pillow, the same kind of thread being used for the pattern and the ground. It is remarkable for the beauty of its ground, richness of design, and evenness of tissue. It is said that more Valenciennes lace is used than any other kind; but the productions of this century are not equal in quality to those of the last. Grammont, Enghien, and Binche are also important centres of the lace industry. The last few years have witnessed a marked development of the manufacture throughout Belgium, and now white and black point and pillow lace is made in every province of the kingdom.—It is estimated that there are 500,000 lace makers in Europe, of whom nearly one half are employed in France. Almost all of the latter work at home. Of the French laces, the most noted is the point d'Alençon, which has had a wide celebrity for more than two centuries, and has been styled the queen of lace. It is made entirely by hand with a fine needle upon a parchment pattern, in small pieces which are

afterward united by invisible seams. The firmness and solidity of the texture are remarkable. Horsehair is often introduced along the edge to give firmness. Although the workmanship of this lace has always been of great beauty, the designs in the older specimens were seldom copied from nature. This circumstance gave a marked advantage to the laces of Brussels, which represented flowers and other natural designs with a high degree of accuracy. The defect, however, has disappeared in the point d'Alençon of recent manufacture; at the Paris exposition of 1867 were specimens containing admirable copies of natural flowers intermixed with grasses and ferns. Owing to its elaborate construction, this lace is seldom seen in large pieces. A dress made of point d'Alençon, the production of Bayeux, consisting of two flounces and trimmings, was exhibited at the exposition of 1867, the price of which was 85,000 francs. It required 40 women seven years to complete it. Lace made at Chantilly formerly held a high rank, but the manufacture has greatly declined; but Chantilly lace is produced at Bayeux and other places. Bayeux and Caen are important centres of the lace industry, and are specially noted for black laces. The productions of Lille and Arras are well known, though that of the former place is greatly diminished. The Lille lace is noted for the beauty of its ground, "the finest, lightest, most transparent, and best made of all grounds." The work is simple, consisting of the ground and the pattern marked by a thick thread. The lace of Baillieu is strong and cheap, and is extensively used for trimming; much of it is sent to America and India. The lace manufacture of Auvergne, of which Le Puy is the centre, is considered the most ancient and extensive in France; the estimated number of women employed is about 130,000. Nearly every kind of lace is produced here.—In England the manufacture of lace is carried on chiefly in the counties of Buckingham, Devon, and Bedford. The work is mostly done by women and girls at home. The best known of the English hand-made laces is the Honiton, so called from the town of this name in Devonshire, where it was first made. The high rank held by Honiton lace in recent years is attributed to the fact that Queen Victoria, commiserating the condition of the lace-workers of Devonshire, and wishing to bring their manufactures into notice, ordered her wedding dress, which cost £1,000, to be made of this material. Her example was followed by two of her daughters and the princess of Wales, and Honiton lace has continued to be fashionable and expensive. In making it, the designs, which often consist of simple sprigs, are formed separately and then attached to the ground. The Honiton guipure has an original character almost unique, and is said to surpass in richness and perfection any lace of the same kind made in Belgium. British point is an imitation lace made near London. Lace

is made to some extent in Ireland, of which the Limerick is the best known, and in Scotland; also in most of the countries on the continent.—*Machine-made Lace.* Nearly every kind of lace is now made by machinery, and such excellence is attained that it is often difficult even for a practised eye to distinguish between the two kinds. According to Mrs. Palliser, however, "the most finished productions of the frame never possess the touch, the finish, or the beauty of the laces made by hand." While the invention of this machinery has brought lace within the means of a large number who were formerly unable to buy it, the demand for the finer products of the pillow and the needle has not been diminished. The manufacture of lace by machinery is carried on chiefly in England and France, the great centre of this industry in the former country being Nottingham, and in the latter Calais. The first attempts to apply machinery to the work were made in 1758 by a stocking weaver of Nottingham, and his machine, which was called a pin machine, making single press point net in imitation of Brussels ground, is said to be still in use in France for making the variety known as *tulle*. The stocking weavers of Nottingham invented other machines, the first for bobbinet in 1799; and though they were all inferior, they made lace more cheaply than by the old methods, and caused Nottingham to become the centre of the trade. But the first really successful machine for bobbinet (so named from the threads crossing the warp being supplied from bobbins) was that of Heathcoat, invented in 1809, and suggested by the machinery employed in making fishing nets. The principle of the invention was in the use of fixed parallel warp threads, round which the bobbin threads were worked as the weft of the fabric, one set going obliquely across from right to left and the second set obliquely across from left to right. Heathcoat was compelled by the opposition his machine excited to remove from Nottingham to Devonshire, and it was not until the expiration of his patent in 1823 that the machine was introduced in the former place. In the machine the warp threads, to the number of 700 to 1,200 in a yard of width, are stretched from a roller, which extends the whole length of the thread beam, and the weft threads are wound each upon a bobbin formed of two thin brass disks riveted together, leaving a narrow space between them for the thread. Each bobbin holds about 100 yards of thread, and there are as many as 1,200 of them to a machine. The arrangement and movement of these in the machine can be understood only by careful inspection and study of the machine itself. The pieces of bobbinet measure from 20 to 30 yards each; the width is variable. The narrowest strips, even the narrow quillings used for cap borders, are made on the same machine, many breadths together, which are temporarily united by threads that are finally

drawn out. There are special machines called warp machines, of great variety, for making the sorts of lace known as warp lace; and there are others called point net for making this quality. A Jacquard apparatus is attached to some of the machines for working in the thick thread of gimp for the ornamental figures. Where the thread passes from one figure to another, it is clipped off by children, who use the scissors for this purpose with great dexterity. The patterns at many of the factories are worked in by hand. The government school of design established at Nottingham has served to educate many skilful designers, who prepare the patterns upon wood or stone as for engraving or printing, those parts intended to leave a mark being in relief. The block, being moistened with some colored pigment, is repeatedly impressed upon the net, until the pattern is transferred to the whole surface designed for it; and the figure is then worked with the needle, the web being extended horizontally in a frame. Before being embroidered the net is carefully examined, and the defective parts are skilfully repaired by a class of workwomen called lace menders. It is also singed by drawing it rapidly over the flame of gas lights. Bleaching and dyeing are final processes, preceding those belonging to calendering. "The labor of washing lace is almost an art; and only the most skilful are engaged in it. After washing, lace is spread out to dry on a cushioned table, and pins of a peculiar sort are run through each hole to prevent it from shrinking. When very fine, or the pattern intricate, an entire day will be spent upon one yard of lace." By means of the application of machinery to lace making, the price of the fabric has been wonderfully reduced; so that a rack of lace, equal to 240 meshes in the length, which in the early part of the present century cost to manufacture 3s. 6d., now costs not more than one penny; and a 24-rack piece, 5 quarters broad, formerly worth £17, is now sold for 7s.—Full information on this subject is given in the "History of Lace," by Mrs. Bury Palliser (London, 1865; 2d ed., 1869). See also the "History of Machine-wrought Hosiery and Lace Manufacture," by W. Felkin (London, 1867).

**LACE-BARK TREE** (*Agave lintearia*), a tree 25 to 30 ft. high, which is found in the island of Jamaica in the most inaccessible rocky places. It belongs to the family *thymelacææ*, which includes the daphnes, our leatherwood or wicopy (*Dirca*), and other plants noted for the great tenacity and sometimes poisonous quality of their inner bark. In *Agave* (from the insular name *Agave*) the inner bark consists of numerous layers, composed of fibres which interlace in all directions, so that when it is stretched transversely a layer of it has much the appearance of lace. Persons who visit Jamaica nearly always bring away a piece of this vegetable lace as one of the curious products of the island; and it is said to be still in

use there for articles of apparel. In the days of slavery in the island the lace-bark furnished thongs for the taskmaster's whips.

**LACÉPÈDE**. See LACONIA, and SPARTA.

**LACÉPÈDE, Bernard Germain Étienne de La Ville**, count de, a French naturalist, born in Agen, Dec. 26, 1756, died at his country seat near St. Denis, Oct. 6, 1825. He early evinced a taste for natural philosophy and musical composition, and going to Paris when 20 years old, was welcomed by Buffon and by the composer Gluck. He gave to music the time not devoted to natural philosophy, composed several operas, and in 1785 published his *Poétique de la musique* (2 vols. 8vo), in which Gluck's principles are expounded. He had previously written an *Essai sur l'électricité naturelle et artificielle* (2 vols. 8vo, 1781), and *Physique générale et particulière* (2 vols. 12mo, 1782-'4), which, although not well received by men of science, had such merits of style that Buffon engaged him as an assistant in continuing his "Natural History," and appointed him keeper and assistant demonstrator at the museum. His *Histoire des quadrupèdes ovipares et des serpents* (2 vols. 4to, 1788-'9) and *Histoire naturelle des reptiles* (4to, 1789) have been frequently reprinted as sequels to Buffon's work. He favored the revolution, received several offices of trust, and was elected in 1791 to the legislative assembly, over which he presided toward the end of the same year. On the massacres of September, he so energetically expostulated with Danton that his friends removed him from Paris, and persuaded him to resign his office at the museum. He did not return till after the 9th Thermidor. Being regarded as the legitimate heir of Buffon, he took his seat among the original members of the institute on its foundation, and was appointed to the newly created professorship of herpetology in the *jardin des plantes*. His *Histoire naturelle des poisons* (6 vols. 4to and 11 vols. 12mo, 1798-1803) and *Histoire des cétacés* (4to and 2 vols. 12mo, 1804) display great descriptive talent. On the organization of the consular government, he was made a member of the senate, in 1801 president of that body, in 1803 grand chancellor of the legion of honor, and soon afterward minister of state. As president of the senate he presented in 1809 the report upon the divorce of Napoleon and Josephine. He submitted to the Bourbons on their first return, joined Napoleon during the hundred days, and, though coldly treated on the second restoration, reentered the chamber of peers in 1819. He died of smallpox. Besides the works mentioned, he was the author of several papers printed in the *Mémoires* of the institute, and, jointly with George Cuvier and Geoffroy Saint-Hilaire, of *La ménagerie du musée national d'histoire naturelle* (1801), a descriptive history of the animals in the *jardin des plantes*. He devoted the last months of his life to correcting the notes of the *Histoire générale, physique et*

*civile de l'Europe, depuis les dernières années du 5<sup>e</sup> siècle jusque vers le milieu du 18<sup>e</sup>,* which appeared after his death (18 vols. 8vo, 1826), and attracted very little attention. To this must be added two other posthumous works: *Histoire naturelle de l'homme* (8vo, 1827), and *Les âges de la nature et l'histoire de l'espèce humaine* (2 vols. 8vo, 1830). Under the title of *Œuvres de M. le comte de Lacépède*, his discourses and natural histories of cetaceous and oviparous animals, snakes, and fishes were collected in 11 vols. 8vo, 1826, and reprinted in 1831-'3, 1836, 1840, and in 3 vols. 8vo, 1862.

**LA CERDA**, the name of an ancient Spanish family, which traced its origin to Fernando, the eldest son of Alfonso X. of Castile, called La Cerda, or the horse's mane, from a large tuft of hair which grew upon his shoulders. In 1269, at the age of 15, this prince married Blanche, daughter of St. Louis of France. Fernando died in 1275, leaving two sons, Alfonso and Fernando, heirs to the crown. But Sancho, second son of Alfonso X., claimed the succession, and caused himself to be proclaimed in his father's lifetime. Yolande, the wife of Alfonso, fled from Castile with her grandchildren, to find a protector for them in her brother Don Pedro, king of Aragon, or in their uncle Philip the Bold of France. These kings resolved that the young princes should remain prisoners in Aragon, and Yolande returned to Castile alone. Blanche, the mother of the princes, wandered through France and Aragon, vainly exclaiming against the injustice of this decision. Alfonso X. died in 1284, and in his will made Alfonso and Fernando de la Cerda his heirs, and even in their default excluded from the throne that son by whom the latter years of his life had been embittered. So sweeping a disinheritation was of little force, and caused slight hesitation between the unfortunate children and Sancho, already in possession of the throne, whose victories over the Moors had just given him the surnames of the Strong and the Valiant. At length, when it became the interest of the king of Aragon to embarrass the king of Castile, he set the princes of La Cerda at liberty. They were proclaimed at Badajoz and Talavera; but being unable to maintain themselves in Castile, they passed into France in the reign of Philip the Fair. They received from him but slight assistance, and their military operations were unfortunate. Sancho had died and had been succeeded by his own son. The kings of Portugal and Aragon, being invited to act as mediators between the ruling and the proscribed branches of the family, gave a decisive sentence in favor of the former, stipulating only that three cities should be ceded to Alfonso to aid him in maintaining the dignity of his birth. Alfonso, deserted by all his defenders, accepted the terms, and received the surname of the Disinherited. He died in 1325, leaving two sons. One of these, Carlos de la Cerda, known also as Charles of Spain, was appointed by King John in

1350 constable of France. But the French court was soon disturbed by a rivalry between Charles of Spain and Charles the Bad, king of Navarre; and in 1354, while on a visit to his young wife in the castle of L'Aigle in Normandy, the former was poniarded by assassins in the pay of the king of Navarre. In 1425 the house of La Cerda became extinct, but it is still represented in the female line by the dukes of Medina-Cœli.

**LA CHAISE** (or *Lachaise*) **D'AIX, François de**, a French Jesuit, confessor of Louis XIV., born at the château of Aix, in Forez, Aug. 25, 1624, died Jan. 20, 1709. He taught philosophy and theology with brilliant success at Lyons, was afterward rector at Grenoble and provincial of his order at Lyons, and in 1675 succeeded Ferrer as confessor of the king. He maintained his position amid the difficulties between Mme. de Montespan and the queen, Mme. de Montespan and Mme. de Maintenon, the Jesuits and the Jansenists, Bossuet and Fénelon, and the courts of Rome and of France. He promoted the revocation of the edict of Nantes (1685), but exerted a conciliatory influence with respect to Fénelon, Quesnel, and the Jansenists. Louis XIV. built for him a country seat on an estate called Mont Louis, which belonged to the Jesuits, the gardens of which are now transformed into the cemetery named Père Lachaise. (See CEMETERY.)

**LACHES** (law Fr. *lachesse*, idleness). The law shows no favor to either tardy or negligent suitors. *Vigilantibus non dormientibus jura subveniunt* (the laws assist those who are vigilant, not those who sleep upon their rights). In this spirit are framed statutes of limitation. (See LIMITATION, STATUTES OF.) So, too, in respect to the production of evidence: testimony discovered after a trial may be heard by the court, if material to the case; but if, by the exercise of a proper diligence, the evidence might have been offered at the trial, its non-production is attributed to the party's neglect or laches, and from the consequence of that the court will not willingly relieve him. The word laches remains familiar in the law of negotiable paper. The same principles of diligence and laches are found in equity practice. The negligence of a party in bringing suit or doing some other act required of him in order to become entitled to redress is laches, which the court of equity will discountenance. In the language of Baron Alderson: "Nothing will call the court's jurisdiction into exercise but conscience, good faith, and reasonable diligence. When these fail, the court will remain passive." For example, one who claims specific performance of an agreement must show that he has been in no default in the premises, but that he has taken all proper measures to secure performance; for if he has been guilty of laches his bill for relief will be dismissed. But, *nulum tempus occurrit regi*, lapse of time does not bar the rights of the crown; in other words, no laches can be imputed to the sover-

eign, whether crown or state. Not unfrequently, however, statutes of limitation are made applicable to demands on behalf of the sovereign, and also to criminal charges.

**LACHMANN, Karl**, a German philologist and critic, born in Brunswick, March 4, 1793, died in Berlin, March 13, 1851. He was educated at Leipzig and Göttingen, and in 1811 founded in the latter city, in conjunction with Dissen, Schulze, and Bunsen, a critical and philological society. He was successively preceptor at the gymnasium and professor in the university of Königsberg, and from 1827 till his death was a professor in that of Berlin. Among his numerous publications are critical editions of Propertius, Catullus, Tibullus, Lucretius, Gaius, the *Nibelungenlied*, Walther von der Vogelweide, and Wolfram von Eschenbach, and *Betrachtungen über die Ilias* (Berlin, 1847).

**LACHNER. I. Franz**, a German composer, born at Rain, Bavaria, April 2, 1804. He studied under the abbé Stadler, and in 1834 became chapelmaster at Mannheim. In 1835 he received the first prize for symphonic composition at Vienna with his *Sinfonia passionata*, and became royal chapelmaster at Munich. His compositions include symphonies, overtures, organ pieces, masses, oratorios, operas, and chamber, pianoforte, and vocal music. **II. Ignaz**, brother of the preceding, born at Rain, Sept. 11, 1807. He was first violinist at the opera and organist of a church in Vienna, and in 1831 became chapelmaster to the king of Würtemberg. He has written for both voice and instruments, and his works comprise operas, symphonies, ballets, and overtures; but he is best known from his songs. **III. Vincenz**, brother of the preceding, born at Rain in 1811. He succeeded Ignaz as organist and violinist in Vienna, and has written many admirable compositions for orchestra and stringed instruments, and also concerted vocal music.

**LACHRYMÆ CHRISTI**. See ITALY, WINES OF. **LACKAWANNA**, the name of a river and coal basin in Luzerne co., Pa. The stream rises in the N. E. corner of the state, enters the N. E. extremity of the northern anthracite coal field, along which it continues for 30 m. past Carbondale, Archbald, Providence, and Scranton, to the N. branch of the Susquehanna, which it enters at Pittston. The continuation of the Lackawanna valley S. W. of Pittston is the Wyoming valley, and they are shut in by the Shawnee mountain on the N. W. and the Wyoming or Moosic mountain on the S. W., the only gaps being where the Susquehanna enters at Pittston and passes out at Nanticoke. These mountains are steep rocky ridges, with a general elevation of from 1,500 to 2,000 ft. above the valley, which at Wilkesbarre is 525 ft. above the sea. The valley has an irregular trough-like form and an undulating surface, corresponding to that of the rock strata and coal beds beneath; and it is studded with thriving cities and towns, collieries, rolling mills, and blast furnaces. The entire area is 198 sq.

m., of which the Lackawanna valley has 100 sq. m. The coal field, the largest and finest of the anthracite basins, fills both valleys, and is of a narrow ellipsoidal form, slightly crescent-shaped, stretching in a N. E. and S. W. direction about 50 m., and not attaining in its widest central portion a greater width than 5 m. (See map in article ANTHRACITE.) The coal is mined from beds 5 to 14 ft. thick, at depths of 100 to 400 ft. from the surface; and in the Wyoming region the maximum depth of the basin is estimated at 1,800 ft., though none of the mines as yet exceed 550 ft. At Scranton there are four beds, 6, 7, 12, and 6½ ft. thick, at the depth of 125, 160, 300, and 400 ft. This coal field, being the nearest to New York, supplies a large portion of the anthracite consumed in that state and further east. Nine tenths of the coal is carried over the mountains. Around Carbondale coal is mined by the Delaware and Hudson canal company, and carried by their railroads over the Moosic mountain to Honesdale, 28 m., and thence by canal to Rondout on the Hudson river, 108 m. Since 1828 they have transported 27,227,471 tons of Lackawanna coal, of which 2,472,449 tons were mined in 1873. The Delaware, Lackawanna, and Western railroad company, whose chief operations are at Scranton, have 618 m. of railroad. Since 1851, when they forwarded their first coal to market, they have sold 26,404,867 tons, including 3,136,306 tons mined in 1873. The operations of the Pennsylvania coal company near Pittston, which has a railroad worked entirely by gravity and stationary engines, cover 16,424,322 tons mined since 1850, of which 1,239,214 tons were produced in 1873. There are other smaller proprietors, and a large iron manufacturing company at Scranton owning five blast furnaces and two rolling mills, which consume 300,000 tons of coal per annum. The avenues to market for coal from the Lackawanna valley are: the Jefferson branch of the Erie railway, from Carbondale N.; the Delaware and Hudson canal company's railroad, E.; the Delaware, Lackawanna, and Western railroad, 145 m., to New York; the Delaware, Lackawanna, and Western railroad, N. into New York state; the Pennsylvania coal company's railroad, E. to Hawley, 47 m., and thence by the Erie railway to New York, 126 m. From Wyoming valley: the Lehigh Valley railroad, 187 m., from Pittston to New York; the Pennsylvania and New York canal and railroad, N. into New York state; the Central New Jersey railroad, 194 m., from Scranton to New York; the Delaware, Lackawanna, and Western railroad and the Pennsylvania canal, S. to Baltimore. Several of these roads have branches into different parts of both valleys. The total amount of coal sent to market from both valleys since 1829 is 97,780,855 tons, including 10,047,241 tons in 1873.

**LA CLEDE**, a S. county of Missouri, drained by Gasconade river; area, 710 sq. m.; pop. in 1870, 9,380, of whom 162 were colored. It



has a rolling surface, in some places well timbered, in others occupied by prairies. The Atlantic and Pacific railroad crosses the county. The chief productions in 1870 were 66,993 bushels of wheat, 317,154 of Indian corn, 57,855 of oats, 27,872 of potatoes, 31,750 lbs. of tobacco, 16,773 of wool, 86,940 of butter, and 1,851 tons of hay. There were 2,854 horses, 2,065 milch cows, 4,005 other cattle, 7,980 sheep, and 12,362 swine; 5 flour mills, and 2 saw mills. Capital, Lebanon.

**LACLOS, Pierre Ambroise François Choderlos de**, a French writer and soldier, born in Amiens in 1741, died in Taranto in 1803. He entered the army at the age of 18, and reached the rank of captain in the corps of engineers in 1778. In 1782 he published a licentious novel, *Les liaisons dangereuses*, which nearly vied in point of popularity with Louvet's *Faublas*. After 30 years of military service he became secretary of the duke of Orleans, and thenceforth mingled in all the intrigues which aimed at the overthrow of Louis XVI. with the view of placing his own master on the throne. He became an ardent revolutionist, a prominent member of the Jacobin club, conducted their journal, and was the first to call for the deposition of the king after his flight to the frontier. With Brissot, he wrote the petition for the same object which was to be signed at the Champ de Mars, July 17, 1791, and brought about the massacre with which Lafayette and Bailly were so bitterly reproached. For a time he served in Marshal Luckner's army in the north, and was made brigadier general, Sept. 22, 1792. The next year he was incarcerated, but was liberated on the 9th Thermidor. After commanding the artillery in the army of the Rhine, he was sent in the capacity of inspector general to the army in southern Italy, where he died. He was the author also of *Poésies fugitives* (1783), of a continuation of Vilate's *Causées secrètes de la révolution du 9 thermidor*, and of several works on military tactics and fortifications.

**LACOMBE, Francis**, a French author, born in Toulouse in 1817, died at Arcachon, Sept. 5, 1867. He was in 1848 politico-economical editor of the *Assemblée nationale*, and fought a duel with Charles Blanc, who had challenged him for writing against his brother Louis. A five-franc piece in his pocket saved his life. His principal works are: *De l'organisation générale du travail* (1848, and many new editions); *Histoire de la bourgeoisie de Paris* (4 vols., 1851-'2); *Histoire de la monarchie en Europe* (4 vols., 1853-'5); and *Histoire de la papauté* (2 vols., 1867, unfinished).

**LACONDAMINE.** See **CONDAMINE**.

**LACONIA, Laconia**, or **Lacedæmon**, the southeasterly division of the ancient Peloponnesus, bordering on Messenia, Arcadia, and Argolis. The country comprised within its boundaries is a long valley shut in on three sides by mountain ranges, and open only on the south to the sea. On the north are the Arcadian

mountains, from which stretch two parallel ranges, Taygetus on the west and Parnon on the east, the former terminating on the S. coast in the promontory of Tanarum (now Cape Matapan), the most southerly point of the continent of Europe, the latter in the promontory of Malea. The principal summit of Taygetus, Taletum (now St. Elias), is 7,900 ft. high; the highest point of Parnon is about 6,350 ft. Taygetus is covered with forests of green pine, which, abounding in ancient times with game, was reputed one of the favorite haunts of Diana. In the southern part are rich quarries of marble and iron. The Eurotas, the chief river (now called Iris or Vasilopotamos), flows through the entire valley, is fed by several smaller streams, and empties into the gulf of Laconia. Lacedæmon or Sparta, the ancient capital, stood on its banks. There were no other towns of much importance. Amyclæ, in the plain S. of Sparta, was the ancient residence of the Achæan kings, but had lost its consequence in the time of Pausanias. Helos, on the Laconian gulf, is supposed to have given the name to the Helots. Gythium, also on the gulf, was the naval station of the Spartans, but there are no very good harbors on the coast. Laconia has much arable land, but the soil in general is poor and difficult to plough. According to Pausanias, the Leleges were the earliest inhabitants. In the time of the Trojan war the Achæan kings possessed the country. They were conquered by the Dorians, who became masters of all Laconia by the middle of the 8th century B. C. (See **SPARTA**).—The modern Laconia, a nomarchy of the kingdom of Greece, occupies very nearly the same territory; area, 1,678 sq. m.; pop. in 1870, 105,851. It is divided into four eparchies. Capital, Sparta, built since the revolution on one of the five hills of the ancient city.

**LACORDAIRE. I. Jean Baptiste Henri**, a French Roman Catholic divine, born at Recey-sur-Ource, Côte d'Or, May 12, 1802, died in Sorèze, Nov. 22, 1861. He was the son of a physician who had served in America under Rochambeau, was educated at Dijon, followed the prevailing impulse that was animating young men against the tendencies of the restoration, distinguished himself alike by the earnestness of his liberal opinions and by a peculiar obstinacy of character, and graduated in 1819 with the highest university honors. While studying the law at Dijon, he continued to attract notice by his intellectual power and anti-Catholic enthusiasm, especially as an orator in the literary societies. In 1821 he went to Paris to practise as a *stagiaire*, and for 18 months was employed as assistant to an advocate at the court of cassation. He also pleaded several cases with great success. But suddenly he abandoned the bar to enter the seminary of Saint Sulpice as a student of theology. He explains this change by saying that the soul of a young man "demands only a great cause to serve with great devotion." His social theories,



doubtless, prepared his return to the Catholic faith, his aim being to revive society by the instrumentality of religion and the church. While in the seminary his ardent piety was alike dissatisfied with the Cartesian philosophy and the Gallican liberties, the former granting too much to human reason, the latter verging to schism, neither being absolute enough. Yet he preserved in his new calling all the love of liberty which had animated his youth, linking it with the vital idea of Christianity, and his peculiar tendencies attracted the notice of his superiors both before and soon after he was ordained to the priesthood in 1827. He was appointed successively chaplain in a convent, in the college of Juilly, and in that of Henry IV. At Juilly he formed the acquaintance of Lamennais, who then advocated extreme ultramontaniam in religion and radicalism in politics; and his doctrines had such an influence on Lacordaire, that he has been called "one of Lamennais's best works." In 1830 Lacordaire and Montalembert associated themselves with Lamennais in founding *L'Avenir*, a journal whose motto was *Dieu et la liberté*, and which was devoted to the maintenance of the absolute authority both of the pope and the people. The bold theories and violent tone of this journal caused the editors to be brought before the civil courts, where Lacordaire's eloquence obtained a verdict of acquittal. He thereupon demanded that his name should be placed on the list of advocates; but the court decided that this was not consistent with his priestly functions. With Montalembert and De Coux he immediately opened a free school without the authorization of the government. The school was closed by the police, and Montalembert, happening just then to become by his father's death a peer of France, was summoned together with his associates before the chamber of peers, to answer for their infraction of the law. They spoke each in his own defence, and were sentenced to pay a fine. The political and religious reforms advocated by *L'Avenir* were condemned by Gregory XVI. in September, 1832. Lamennais, who had gone to Rome with the other editors for the purpose of averting this blow, replied to it shortly afterward by publishing his *Paroles d'un croyant*. But the others submitted to the papal sentence, and Lacordaire, separating himself for ever from Lamennais, wrote a pamphlet declaring his unqualified obedience to the Roman see. In 1834 he began his first course of lectures (*conférences*) in the chapel attached to the collège Stanislas. Though severely censured by many, their impression on young men particularly was so great that Archbishop De Quélen invited the preacher to deliver the Lenten course in the cathedral of Notre Dame in 1835. His sermons were admired not less for their literary excellence and a sort of romantic tone, than for their religious fervor. "He knows more of literature," said a severe critic, "than of history, more of history

than of philosophy, and more of philosophy or even politics than of religion;" and in his conferences all the social questions which had recently agitated France were discussed with an ability and splendor of style that attracted the most eminent men of letters. After two years of success, he again went to Rome in 1836, for the purpose, as was said, of studying theology, and there wrote his *Lettre sur le saint siège*, a solemn argument and protest against the doctrines of *L'Avenir*. He had already conceived the plan of reviving or founding a religious order in France, and after preaching in 1838 in Notre Dame he returned again to Rome, entered the order of the Dominicans and the convent of the Minerva, passed his novitiate in the convent of Quercia, wrote his *Vie de Saint Dominique* (Paris, 1840; new ed., 1858; translated into Spanish, Polish, and German), and in 1841 resumed his chair at Notre Dame, a friar preacher with shaved head and white robe. He preached afterward in the principal cities of France, reëstablishing the order of Dominicans, and displaying a new style of eloquence, which excited at once surprise and enthusiasm. On the outbreak of the revolution of 1848, being elected to the constituent assembly, he appeared there in his Dominican habit, and took his place on "the mountain," two benches from Lamennais, but soon gave in his resignation when he found that his reconstructive theories would have little chance in the conflicts of partisan politics. On Feb. 10, 1853, he preached a charity sermon in the church of St. Roch in behalf of the city poor schools. His theme was the formation of true manhood by education. He said toward the conclusion: "He who uses base means even for a good purpose, even for the salvation of his country, is still a scoundrel. There is no need of an army to stop my speech; a single armed man is sufficient. But God has given me, for defending my words and the truth that is in them, a something which can withstand all the empires of earth." He was commanded forthwith to quit Paris. He resigned shortly afterward his office of provincial of the Dominicans in France, ceased to preach in public, and devoted himself exclusively to the direction of the college of Sorèze, which belonged to himself. He wrote in 1858 that the new provincial and the general of his order had completely set him aside, and were laboring to ruin his influence among the French Dominicans. After the death of Alexis de Tocqueville, Lacordaire was elected his successor by the French academy; and in his inaugural discourse, Feb. 2, 1860, he made a glowing panegyric of American free institutions. Till the end of his life he united with Montalembert and Bishop Dupanloup in denouncing Louis Veuillot's manner of defending the interests of the Roman Catholic church. Among his works are: *Considérations philosophiques sur le système de M. de Lamennais*

(1834); a *Mémoire pour le rétablissement en France de l'Ordre des frères prêcheurs* (1840); *Conférences de Notre Dame de Paris, 1835-'50* (4 vols., 1844-'51); those on "God" and "Christ" translated into English by Henry Langdon, New York, 1871); *Lettre à un jeune homme sur la vie chrétienne* (1858); *De la liberté de l'Italie et de l'Eglise* (1861); and *Lettres à des jeunes gens* (1862). His complete works have appeared in 6 vols. (Paris, 1858). Count de Falloux has published *Correspondance du père Lacordaire et de Madame Swetchine* (1865).—See Montalembert, *Le père Lacordaire* (8vo, Paris, 1862); Chocarné, "Inner Life of Père Lacordaire" (8vo, London and New York, 1867); Villard, *Correspondance inédite et biographie du père Lacordaire* (Paris, 1870); De Loménie, *Galerie des contemporains illustres*; and Sainte-Beuve, *Lacordaire orateur, in Causeries du Lundi*. **II. Jean Théodore**, a French naturalist, brother of the preceding, born at Recey-sur-Ource, Feb. 1, 1801, died in Liège, Aug. 31, 1870. He studied law in Dijon, but from his love of natural science made four different voyages to South America between 1825 and 1832. He visited the Argentine republic, Chili, the Brazilian provinces of Pernambuco and Rio de Janeiro, and French Guiana, and afterward travelled through the interior of Senegal. Toward the close of 1832 he was attached to the editorial staff of the *Temps* in Paris, and wrote for several scientific periodicals. In 1835 the Belgian government appointed him professor of zoology in the university of Liège; in 1838 he became professor of comparative anatomy, and in 1850 dean of the faculty of sciences. Among his numerous publications are: *Introduction à l'entomologie* (2 vols., Paris, 1834-'7); *Faune entomologique des environs de Paris* (1835); and *Histoire naturelle des insectes: genera des coléoptères* (8 vols., 1854-'68).

**LACQUER**, a transparent or colored varnish for covering articles of brass or wood, either for ornament or to preserve them from becoming tarnished. Shell lac is the basis of the varnish commonly employed, whence the coating is termed lacquer, and the process lacquering. Holtzapffel gives the following recipes for "hard-wood lacquer": 2 lbs. of shell lac to 1 gallon of alcohol, but without turpentine; or 1 lb. of seed lac and 1 lb. of white rosin, dissolved in 1 gallon of alcohol. Various recipes are given for the lacquer for brass; the simplest and best pale lacquer is made by dissolving, without applying heat and by agitating together for five or six hours, half a pound of best pale shell lac and a gallon of alcohol. After standing for some time the clearer portion may be decanted, or the whole filtered through paper, and afterward kept in a close bottle excluded from the light. To give a yellow tint, gamboge, turmeric, or Cape aloes may be added to the shell lac; and for a red, dragon's blood and annotto. The most convenient method of employing the colors is to make

saturated solutions of them in alcohol, and to add suitable quantities of these to the pale lacquer. Solutions of turmeric, gamboge, and dragon's blood will be the most useful. The turmeric gives a greenish yellow tint, and with the addition of a little gamboge gives the green color to the lacquer used for bronzed works.

**LAC QUI PARLE**, a S. W. county of Minnesota, bordering on Dakota; area, 1,450 sq. m.; pop. in 1870, 145. It is bounded N. E. by the Minnesota river, which here receives the Lac Qui Parle river. The surface consists of rolling prairies.

**LACRETELLE. I. Pierre Louis**, a French jurist, born in Metz in 1751, died in Paris, Sept. 5, 1824. He had gained distinction both as an advocate and *littérateur*, when in 1778 he went to Paris, and was for several years one of the editors of the *Grand Répertoire de Jurisprudence*. His *Discours sur le préjugé des peines infamantes* was crowned by the French academy in 1786, and in 1787 he was one of a commission named by the king for the reform of penal legislation. In 1791 he was elected deputy for Paris in the legislative assembly, where he voted with the minority which defended the constitution of that year, supported the constitution in the club of the Feuillants, opposed the accusation of Lafayette in 1792, and afterward retired from Paris till the 9th Thermidor. He was a member of the legislative body in 1801, and succeeded La Harpe in the French academy in 1803. He accepted no office under the empire or the restoration, and wrote against the latter in the *Minerve Française*, founded in 1817 by Benjamin Constant, Étienne, Jouy, and others, of which he was one of the editors. His complete works, which treat various questions in philosophy, literature, and politics, were published in 1824, in 6 vols. **II. Jean Charles Dominique de**, a French historian, brother of the preceding, born in Metz, Sept. 3, 1766, died near Mâcon, March 26, 1855. He went to Paris in 1787, and was attached for a time to the *Journal des Débats*, for which he reported the speeches made in the constituent assembly and wrote many articles. In 1790 he became secretary to the duke de La Rochefoucauld-Liancourt; and he was associated with him in the project of securing the escape of the royal family, which was defeated by the king's indecision. After the execution of Louis XVI., of which he composed the narrative that was generally copied and translated, he occupied himself in lecturing on history and in writing for the *Journal de Paris* and the *Républicain Français* against the Jacobin party. On the 13th Vendémiaire (year IV.) he was proscribed as one of the leaders of the royalist movement against the convention, and retired to Épinay, where he began (1795) his *Histoire de France pendant le dix-huitième siècle* (6 vols. 8vo, 1808). Returning to Paris, he was arrested on the 18th Fructidor, and imprisoned for 23 months (1797-'9). Under the empire he was a member of the bureau of the press, editing at

the same time *Le Publiciste*, became imperial censor in 1810, successor of Esmeñard in the academy in 1811, and professor of history in the faculty of letters in 1812, where for 36 years his course was numerously attended. He was among the first to rally around the Bourbons in 1814, and in 1822 he received letters of nobility from Louis XVIII. When in 1827 Peyronnet proposed a law restricting the press, Lacroix delivered before the academy an eloquent harangue against it, which led that body to address the king in opposition to it. For this speech he lost his office of royal censor, which he had held since 1814. He retired to Mâcon in 1848. His historical works, nine in number, comprise the period from the commencement of the religious wars to the accession of Louis Philippe, but most fully that of the first revolution. Most of them are the first that were written on the period of which they treat, and the judgments are often those of a contemporary partisan.

**III. Henri de**, a French author, son of the preceding, born in Paris in 1816. He has published a number of works, including *Les cloches* (poems, 1841), *Dona Carmen* (1844), *Valence de Simian* (1845), *Nocturnes* (1846), *Contes de la méridienne* (1859), *Les noces de Pierrette* (1859), *Les nuits sans étoiles* (1861), *Le colonel Jean* (1865), and *Sous la hache* (1872). The last, a philosophical romance, is a plea for the abolition of the death penalty. In 1871 he was elected to represent Saône-et-Loire in the national assembly.

**LACROIX. I. Paul**, a French novelist and historical and philological writer, born in Paris, Feb. 27, 1806. Under the pseudonym of *Le bibliophile Jacob*, he wrote a number of historical tales and novels, in which he displayed much curious erudition. In 1834-5 he published *Histoire du 16<sup>e</sup> siècle en France, d'après les originaux manuscrits et imprimés* (4 vols. 8vo). He then produced in rapid succession an extraordinary number of novels, translations, and historical, philological, bibliographical, and polemical works. He has also been the editor of or a contributor to many periodicals. Since 1854 he has edited the *Revue universelle des Arts*, published simultaneously at Paris and at Brussels. He was appointed in 1855 keeper of the arsenal library, and is a member of historical committees connected with the ministry of public instruction. Among his later works are: *Dissertations bibliographiques* (1864); *Un mobilier historique des XVII<sup>e</sup> et XVIII<sup>e</sup> siècles* (1865); *L'Histoire de la vie et du règne de Nicolas 1<sup>er</sup>, empereur de Russie* (4 vols., 1864-'8); *Arts au moyen âge et à l'époque de la Renaissance* (1868; translated and illustrated, London, 1873; supplement, 1870); *Mœurs, usages et costumes au moyen âge et à l'époque de la Renaissance*, with 440 plates (1871); and *La vie militaire et la vie religieuse au moyen âge* (1872).—His wife, **APOLLINE BIFFE**, who was once an actress under the name of Pauline Derfeuille, gained some reputation as a novelist.

Among her works are *Fleur de serre et fleur des champs* (1854), *Falcone* (1856), and *Madame Berthe* (1857). **II. Jules**, a French poet and novelist, brother of the preceding, born in Paris, May 7, 1809. In 1830 he published a translation of Shakespeare's "Macbeth," which was highly praised by literary critics. He subsequently applied himself to novel writing, in which line of composition he is more remarkable for bitterness of sentiment, satirical power, and intricacy of plot, than morality and chasteness of style. His five-act tragedy, *Le testament de César*, was performed with success in 1849, at the Théâtre Français. In his *Valéria* (1851), another five-act play, written in conjunction with Auguste Maquet, Rachel filled two different parts. His literal version of Sophocles's *Œdipus Rex* was performed with marked success, Sept. 18, 1858, and obtained in 1862 from the French academy the grand prize of 10,000 francs. In 1868 his *Le roi Lear*, in five acts, in verse from Shakespeare, was successfully presented at the Odéon.

**LACROIX, Paul Joseph Eugène**, a French architect, born in Paris, March 19, 1814, died there in February, 1873. He was a foster brother of Napoleon III., studied in Paris and in Italy, was employed in restoring the town hall of St. Quentin, and as architect of the Elysée (1852) he designed the enlargement of this palace and also that of the Tuileries. He designed the tomb of Pope Adrian V. at Viterbo, a monument to Ney, and many other works.

**LACROIX, Sylvestre François**, a French mathematician, born in Paris in 1765, died there, May 25, 1843. He belonged to a poor family, but by his own exertions acquired an education, and became such a proficient in mathematics, that when scarcely 17 he was appointed professor in the marine school at Rochefort. In 1786 he went to Paris, and in 1787 became a professor in the military school. While he occupied this chair, the academy of sciences awarded him a prize of 6,000 livres for a treatise on maritime insurance. He held professorships consecutively in the artillery school, the normal school, the polytechnic school, the Sorbonne, and the collège de France. He was among the original members of the institute. In 1796 he began the publication of his elementary *Cours de mathématiques*, comprising arithmetic, algebra (English translation, Cambridge, Mass., 1818), geometry, and trigonometry, which was for years the best text book of its kind. Among his works are *Traité du calcul différentiel et intégral* (2 vols. 4to, 1797), and treatises on mathematical and physical geography and the teaching of mathematics.

**LA CROSSE**, a S. W. county of Wisconsin, separated from Minnesota by the Mississippi river, bounded N. W. by Black river, and drained by the La Crosse; area, 450 sq. m.; pop. in 1870, 20,297. The surface is undulating and generally well timbered, and the soil is fertile. The chief productions in 1870 were 581,485 bushels of wheat, 21,789 of rye, 192,503

of Indian corn, 286,126 of oats, 25,985 of barley, 66,526 of potatoes, 27,179 lbs. of wool, 182,501 of hops, 248,638 of butter, and 15,297 tons of hay. There were 3,486 horses, 4,438 milch cows, 5,231 other cattle, 9,288 sheep, and 4,408 swine; 2 manufactories of agricultural implements, 1 of boats, 3 of carriages, 1 of iron castings, 1 of machinery, 4 of saddlery and harness, 1 of sash, doors, and blinds, 5 of tin, copper, and sheet-iron ware, 1 of woollen goods, 4 breweries, 7 saw mills, and 1 bridge-building establishment. Capital, La Crosse.

**LA CROSSE**, a city and the capital of La Crosse co., Wisconsin, on the E. bank of the Mississippi river, at the mouth of the Black and La Crosse rivers, 105 m. W. N. W. of Madison and 175 m. W. N. W. of Milwaukee; pop. in 1860, 3,860; in 1870, 7,785; in 1874, including the village of North La Crosse annexed in 1871, estimated by local authorities at 13,000. It is finely situated on a level prairie, and has many handsome buildings, including the court house, which cost \$40,000, the post office, an opera house, and the high school building. It has ample railroad communication by means of the Chicago, Milwaukee, and St. Paul, the Chicago and Northwestern, the La Crosse, Trempealeau, and Prescott, the Southern Minnesota, and the Chicago, Dubuque, and Minnesota lines. The city has an extensive trade in lumber, and contains a large manufactory of saddlery and harness, a plough factory, three foundries and machine shops, a grist mill, a large sash, door, and blind factory, several breweries, nine saw mills, and three banking houses. The United States courts for the W. district of Wisconsin hold one session here annually. There are flourishing graded schools, a young men's library of 2,400 volumes, two daily and five weekly (one German and one Norwegian) newspapers, a semi-monthly periodical, and 17 churches.—La Crosse was first laid out in 1851, though an establishment for trading with the Indians existed as early as 1841. It was incorporated as a city in 1856.

**LACTANTIUS, Firmianus**, one of the fathers of the Latin church, born, according to some, in Firmium, Italy, according to others, in Africa, about 260, died in Treves about 325. The names Lucius Cœlius or Cæcilius, sometimes bestowed on him, are not mentioned by Jerome and Augustine, or found in any ancient manuscript. According to his own account, he was born of heathen parents, and became a Christian at a mature age. Jerome calls him a pupil of the African Arnobius, under whom he studied rhetoric at Sicca, near Carthage. In early life he published in hexameters a work entitled *Symposion*, being a collection of riddles for convivial amusement. This work gained him such a reputation that he was invited by Diocletian in 301 to open a school of eloquence in Nicomedia, where he remained till 312. As this city was almost exclusively inhabited or visited by Greeks, Lactantius found but few pupils. During his stay there

the Christians were persecuted, and their religion assailed by the heathen philosophers. Having, it is surmised, become himself a Christian about this epoch, he wrote in defence of the persecuted creed his great work *Institutiones Divinae*, of which, while still in Nicomedia, he composed an epitome addressed to his brother Pentadius. This was followed by another entitled *De Opificio Dei*. In the former work Lactantius proposes to demonstrate the right of the Christian religion to exist legally, and to communicate its doctrines by public teaching; in the latter he grounds the belief in the existence of a God on the adaptations seen in every known form of organic life. In 312 Lactantius was called to Treves by the emperor Constantine, to superintend the education of his son Crispus. He appears to have lived in great poverty while in Nicomedia, and to have distinguished himself by his modesty and disinterestedness while at court. Before his conversion to Christianity, Lactantius had been a diligent student of the great Roman orator, whose harmonious and eloquent style he had labored so successfully to imitate that he acquired from posterity the appellation of the "Christian Cicero," and St. Jerome says that he was by far the most learned man of his age. Besides the works mentioned, he wrote a treatise *De Ira Dei*, which is still extant, two books to Asclepiades, and eight books of letters, which are lost. The work *De Mortibus Persecutorum* is thought by many of the best critics to belong to Lactantius, and to be identical with the work *De Persecutione Liber unus* mentioned as his by St. Jerome. The first edition of his works was printed at Subiaco in 1465; later editions are by Le Brun and Lenglet du Fresnoy (2 vols. 4to, Paris, 1748), Père Édouard de St. François Xavier (14 vols. 8vo, Rome, 1754-'9, considered the best), and in Gersdorf's *Bibliotheca Patrum Ecclesie selecta* (vols. x., xi., Leipsic, 1842).—See "A Summary of the Writings of Lactantius," by the Rev. J. H. B. Mountain (London, 1839).

**LACTIC ACID**, a product of the decomposition of any kind of sugar in solution, induced by the presence of certain albuminous ferments, as diastase exposed for some time in solution to the air. Milk contains both the elements for the production of this acid, sugar of milk and albuminous caseine. Its change to sour milk is called the lactic fermentation, and lactic acid is a product of this change. It was in sour milk that the acid was originally discovered by Scheele, whence he named it lactic; but it has since been obtained from the juices of many vegetables, and from the fluids of the stomach and flesh of animals. As milk turns, the coagulum which is formed is a combination of lactic acid and caseine. If the lactic acid be taken up by bicarbonate of soda, the caseine set free induces further fermentation, and more lactic acid is formed from the sugar of milk; and so by adding more soda the process may be kept up until all the sugar of milk is

converted into lactic acid. If a succeeding fermentation be allowed to take place, butyric acid is produced. The composition of lactic acid is expressed by the formula  $C_3H_5O_3$ , and it has the same centesimal composition as sugar of milk. When concentrated *in vacuo* over sulphuric acid, lactic acid is obtained in the form of a sirupy colorless fluid, of specific gravity 1.215 and very sour. At a temperature of 266° F. it yields water and becomes an anhydrous solid (dilactic acid), which dissolves sparingly in water, but readily in alcohol and ether. Lactide is a crystalline substance, of composition  $C_6H_8O_4$ , produced by subjecting the acid to a temperature of 482°; it is now called lactic anhydride.—In the animal economy lactic acid is thought to play an important part from its property of dissolving large quantities of freshly precipitated phosphate of lime; and this has led to its prescription in medicine with the view of its removing phosphatic deposits in the urine, as well as to hold in solution phosphate of lime when given as a medicine. It has also been recommended in certain forms of dyspepsia. It has been proposed as a local application to dissolve the false membranes of croup, being applied in liquid form, or as a spray from an "atomizer;" but the success obtained with this treatment by other observers has not equalled that claimed by the original proposer. The acid may be conveniently prepared by evaporating sour milk to one eighth its bulk, filtering, adding lime, again filtering, separating the crystals of lactate of lime which form, purifying these by redissolving and recrystallizing, and finally decomposing the salt by means of oxalic acid and recovering the lactic acid by filtering. But it is best obtained by dissolving 8 parts of cane sugar in about 50 parts of water, and fermenting by 1 part caseine and 3 parts chalk, and decomposing the lime salt by sulphuric acid.—The salts formed by this acid with bases are called lactates. The only important one is the lactate of iron, which is much employed in medicine as a stimulant and tonic. It is prepared by digesting lactic acid and iron filings at a gentle heat on a sand bath for five or six hours, and then allowing the liquor to boil. It is then filtered, concentrated, and allowed to cool and crystallize. The crystals are drained in a funnel, washed with alcohol, dried rapidly, and transferred to a bottle, which must be well stopped. Lactate of iron when pure is in white crystalline plates. It has an acid reaction, is soluble in 12 parts of boiling water, and the solution soon becomes yellow from the iron passing to a higher degree of oxidation. When sold in a powdered state, it is apt to be adulterated; for this reason it should be purchased in the crystals. The medicinal applications may be in the form of lozenges or sirup. In one of the Paris hospitals it has been introduced into bread, hence known as chalybeate bread, a grain of lactate of iron in each ounce, which does not injuriously affect the taste or

quality of the bread. This is given to patients suffering from chlorosis, and in other forms the medicine has proved beneficial in this disease. It is observed that it decidedly increases the appetite. Sarcolactic acid is the variety which is obtained from the juice of flesh; paralactic acid also exists.

**LACTOMETER.** See GALACTOMETER.

**LACUSTRIANS.** See LAKE DWELLINGS.

**LADAKH**, or **Middle Thibet**, a state of central Asia, subject to Cashmere, bounded N. by East Turkistan, E. by Great Thibet, S. and S. W. by the Punjab and Cashmere proper, and W. by Cashmere and Bulti; area, about 30,000 sq. m.; pop. about 150,000. The country is elevated and rugged, lying mostly between the Karakorum range and the western Himalayas. The river Indus flows N. W. between these ridges, its elevation here being nearly 11,000 ft. above the sea. The climate is cold and arid. The soil is sterile, but the slopes, being industriously cultivated, produce wheat, barley, buckwheat, apples, and apricots. The domestic animals are horses, yaks, cows, the zho (cross of the yak and the cow), asses, sheep, and goats. The sheep attain great size, and are used as beasts of burden in some parts of the country. Iron, lead, copper, and sulphur are found in considerable quantities. The people of Ladakh are mostly Thibetans. They are mild, good-humored, peaceable, and honest, but indolent, given to intoxication, and very sensual. Polyandry prevails among the lower classes. They carry on a trade in wool, used for the manufacture of Cashmere shawls. The country was formerly governed by independent despots, from whom it was wrested by Gholab Sing, the late rajah of Cashmere, in 1835. Capital, Leh.

**LADANUM**, or **Labdannum**, a resinous exudation of various evergreen shrubs of the genus *Cistus*, principally of the *C. Creticus*, found in the islands of the Grecian archipelago and the neighboring countries. The purer variety sometimes found in commerce is put up in bladders in masses of several pounds each. The substance readily softens and becomes adhesive in the hand. Externally it is dark red, almost black, and internally grayish. It diffuses an agreeable balsamic odor, and has a bitter and somewhat acrid taste. The common quality is very largely mixed with sand and other foreign matters; it is in spiral-shaped pieces of dark gray color, and hard and brittle. It contains only about 20 per cent. of resin, while in the purer quality 86 per cent. has been found; the other ingredients are gum and wax, with malate of lime, and in the common quality 72 per cent. of foreign substances. Ladanum, like many other similar drugs, has fallen into disuse; it was formerly employed in fumigation, and as a stimulant expectorant, and also as an ingredient of plasters.

**LADD**, **William**, an American philanthropist, born in Exeter, N. H., May 10, 1778, died in Portsmouth, April 9, 1841. He graduated at



Harvard college in 1797, and took an active part in organizing the American peace society, of which he was for many years president. In its interests he edited the "Friend of Peace," commenced by Dr. Noah Worcester, and the "Harbinger of Peace," and published a number of essays and occasional addresses on the subject of peace, including "An Essay on a Congress of Nations" (8vo, Boston, 1840). He carried his views to the extent of denying the right to maintain defensive war, and caused this principle to be incorporated into the constitution of the American peace society.

**LADINO**, a term applied throughout Central America, and particularly in Nicaragua and Guatemala, to the mestizo or half-breed descendants of whites and Indians. It was sometimes, though rarely, used by the royal governors and officers very nearly in the sense of *criollo* or creole, to distinguish Spaniards born in the country from those who had emigrated from the Peninsula. In the production of the ladino the white element has almost always been represented by the father, inasmuch as few women accompanied the first settlers on their voyage to America. The ladinos are for the most part of a yellowish orange tinge; the males more nearly approach to the European in form and feature than the females, in whom the Indian element predominates, but who may be said to be the handsomest women in Central America. The ladinos disdain all manual labor, and seek to adopt the same pursuits as the whites, with whom they desire to be confounded as much as possible; hence a multitude of candidates for a very limited number of government offices, the result of which is that the ladinos form a restless, turbulent class, to whom may be attributed in a great measure the civil wars and general insecurity of the Central American republics.

**LADISLAS** (Hun. *László*), Saint, king of Hungary (1077-95). See HUNGARY.

**LADISLAS** (Pol. *Władysław*) II., king of Poland, born in Lithuania about 1350, died in Grodek, near Lemberg, Galicia, May 31, 1434. He was the son of Olgerd and grandson of Gedimin, the grand dukes of Lithuania, and as a pagan prince, though the son of a Christian mother, received the name of Jagello or Jagiello. He succeeded his father in Lithuania, and in 1386, having married Hedvig, the beautiful and pious young daughter of Louis the Great, king of Hungary and Poland, became a Christian and received the Polish crown. He converted Lithuania to Christianity, and finally united it with Poland. He was successful in his wars against the Teutonic knights, whom he routed in the battle of Grünwald (1410). He greatly contributed to the development of the power of his kingdom, which was ruled by his dynasty down to 1572, when it became an elective state.—His son and successor, **LADISLAS III.**, having been elected king of Hungary (as Uladislas I.), waged war with the Turks, made peace with them, broke his oath, and fell

in the battle of Varna (1444). He was succeeded in Poland by his brother Casimir IV.

**LADMIRALTY, Louis René Paul de**, a French soldier, born in 1808. He graduated at Saint-Cyr in 1829, and rose in Algeria to the rank of brigadier general in 1848. He was wounded at the battle of Solferino in 1859. In 1866 he became senator, and in 1867 was put in command of the second army corps and of the camp of Châlons. During the Franco-German war he was at the head of the fourth corps, and took part in the battles around Metz. On the capitulation of that fortress he became a prisoner in Germany, and returned to France after the conclusion of peace in May, 1871. He took a conspicuous part as commander of the first corps under MacMahon in the operations against the commune, and on July 1, 1871, was appointed military governor of Paris, which post he still holds (1874). He has published *Bases d'un projet pour le recrutement de l'armée de terre* (1871).

**LADOGA**, a lake of Russia, the largest in Europe, surrounded by the governments of Viborg, Olonetz, and St. Petersburg, and lying between lat. 59° 58' and 61° 46' N., and lon. 29° 50' and 32° 55' E.; length 124 m., greatest breadth 87 m.; area, about 7,000 sq. m. It is 59 ft. above the sea. Its depth is very variable, being in some places upward of 150 fathoms, and in others too shallow for navigation. Its coast is generally low, much indented, and dangerous from hidden reefs. Its waters abound with fish. Storms are frequent and sudden, and the influx of 70 streams causes strong and uncertain currents. It is connected with Lake Onega by the river Svir, with Lake Ilmen by the Volkhov, and with the gulf of Finland by the Neva. It contains several islands, some of them inhabited; the largest are Valaam on the north and Konevets on the south. The principal towns on its coasts are Kexholm, Schlüsselburg, Serdobol, and Novaia (New) Ladoga. The Ladoga, Sias, and Svir canals form a continuous line around the S. and S. E. sides of the lake; and by the artificial union of several rivers and lakes vessels pass from the Baltic to the Volga and thence to the Caspian sea. There is communication also with the White sea.

**LADRONE, Marianne**, or **Mariana Islands**, a group of about 20 islands belonging to Spain, in the north Pacific ocean, N. of the Caroline islands, between lat. 13° and 21° N., and lon. 144° and 146° E.; area, 416 sq. m.; pop. about 10,000. When the Spanish missionaries sent by Queen Mariana, widow of Philip IV. of Spain, established themselves on the islands toward the end of the 17th century, the natives numbered 40,000. The present inhabitants are mostly descendants of settlers from Mexico and the Philippines. The islands are of volcanic formation, mountainous, well watered, and well wooded. The breadfruit, banana, and cocoanut grow to perfection, and the soil is productive in sugar, rice, corn, tobacco,



cotton, and indigo. The climate is salubrious, the heat being tempered by the trade winds. Horses, cattle, and llamas were early introduced by the Spaniards; wild hogs are numerous and very large. The principal islands are Guahan, Rota, Aguijan, Saypan or Seypan, and Tinian. Lord Anson visited Tinian in 1742, and found there cyclopean ruins. The seat of government is at San Ignacio de Agaña, on the island of Guahan, the most southerly of the group, where there is also a good fortified harbor. Asuncion and Pagon, in the north, are noted for their volcanoes. The general navigation is rendered dangerous by shoals and currents. A pearl fishery exists on the coast of Saypan. Magellan discovered the islands shortly before his death in 1521, and named them the Ladrones from the thievish disposition of the natives. They were afterward called the Lazarus islands, and in 1667, when the Jesuits settled there, they were renamed Marianne or Mariana in honor of the Spanish queen.—There are two other small groups called Ladrones: one in China, situated at the mouth of the bay of Canton, which is a resort of pirates; the other in the Pacific, 10 m. off the coast of Colombia.

**LADY** (Anglo-Saxon, *hláfdige*; Old Eng., *levedy*), a title used as the correlative of lord (A. S. *hláford*), or, in common speech, as the correlative of gentleman. It is supposed to have signified originally "bread-giver" (Goth. *hlaiþ*, loaf, and *dian*, to distribute), or "she who takes care of the bread" (A. S. *hláf*, loaf, and *weard*, to look after, to care for, to ward). The primary notion entertained of a chief or lord was that he was the provider of the food consumed by his family, and his lady had the care or distribution of it. Horne Tooke's derivation of the word from *hlifian*, to lift, *i. e.*, one raised to the rank of her lord, is untenable. As a title of honor in England, it belongs to peeresses, and to the wives of peers and of peers by courtesy, being prefixed in such cases to the peerage title. The daughters of dukes, marquises, and earls are designated by courtesy by the title, prefixed to their Christian and their surname. The wives of baronets receive it by courtesy, their legal designation being dame, and it is generally extended, also by courtesy, to the wives of knights of every degree. In Saxon times the queen was occasionally termed *ses hláfdig*, the lady, which is still preserved in the phrase "our sovereign lady the queen." In common usage the term is applied to any woman of the better class, and in the United States it has so lost its significance as to be given indiscriminately to almost any well dressed woman.—"Our Lady" is a title frequently applied to the Virgin Mary, generally in connection with some attribute, as "Our Lady of Mercy." Lady chapel, in cathedrals, is a chapel dedicated to the Virgin, and is usually placed east of the altar.—Lady day, in the calendar, is the 25th of March, being the Annunciation of the

Virgin Mary. In England and Ireland it is one of the regular quarter days, on which rent is made payable.

**LADY-BIRD** (sometimes called **LADY-BUG**), a small beetle of the trimerous division, and of the genus *coccinella* (Frisch). In this extensive and well known genus the body is hemispherical, the thorax very short, the antennæ composed of 11 joints and the tarsi of 8, the



Lady-Bird.

elytra convex, the under surface flat, and the legs short; the digestive canal is nearly straight, and as long as the body. The general colors are red, yellow, or orange with black spots, or black with white, red, or yellow spots. Many species have been described. The larvæ are small, bluish, flattened grubs, spotted with red or yellow, and with six legs on the anterior part of the body; they are hatched from yellowish eggs, of a disagreeable odor, laid usually in the spring in clusters among the *aphides* or plant lice. Both the larvæ and the perfect insects destroy immense numbers of these lice, and are therefore among the best friends of the agriculturist; when found upon plants they are in quest of their insect prey, and deprive vegetation of none of its juices, and they are entirely guiltless of producing the potato rot or any other similar disease. There are some very small lady-birds of a blackish color, and with a few short hairs, of the genus *scymnus*, whose larvæ are as savage among the plant lice as the lion among the smaller mammals.

**LADY'S SLIPPER**, the common name, corresponding to the generic one, of orchidaceous plants of the genus *cyprripedium* (Gr. *Κύπρις*, a name of Venus, and *πόδιον*, a sock), also sometimes called moccason flower. The genus and two other allied ones differ from other orchids in having two anthers instead of one; the sepals are three, two of them frequently united; petals three, of which the lower one, or lip as it is termed in orchids, is inflated to form a large sac, which in some species bears a resemblance to a slipper. To add to the ordinarily strange appearance of the flower, the lateral petals are in some of the exotics prolonged to form tails, which hang down for several inches below the lip. The genus has a wide range, from the tropics, where they have leathery and persistent leaves, to Canada and Siberia; the leaves of the northern ones are thin, and perish with the stem after flowering. Our commonest native lady's slipper is the stemless (*C. acavale*), which is found in woods, especially under evergreens, from the Carolinas to Canada, but is much more frequent northward; it has two large oblong leaves, from between which arises a stem, sometimes a foot high, bearing at its summit a single large flower, the lip of which, about 2 in. long, is beautifully veined with rose purple on a lighter or white ground. Two yellow-flowered species (*C. parviflorum* and *C. pubescens*), which differ but little except in size, are not rare in

bogs and woods; these have leafy stems 1 to 2 ft. high, and one to three flowers. The roots of these are used by herb doctors as antispasmodics under the name of nervine, nerve-root, &c. The ram's-head and small white lady's slipper (*C. arietinum* and *C. candidum*) are the



Lady's Slipper (*Cypripedium spectabile*).

rarest of our native species, and highly prized by botanists. The most beautiful of the American, and in some respects the finest of all cypripediums, is the showy lady's slipper (*C. spectabile*); though not very common, it grows in abundance in cold bogs in some localities upon the northern border, and extends along the mountains as far south as North Carolina. The stems, about 2 ft. high, as well as the numerous ovate leaves, are downy, and bear at the



Nepal Lady's Slipper (*Cypripedium insigne*).

summit one to three large flowers, of which the much inflated lip is white, and marked in front with pinkish purple, the color shading off much after the manner of the cheek of a well ripened peach. This species, so highly prized abroad, is seldom seen in cultivation in its native coun-

try; there is nothing in the whole range of hardy herbaceous plants that equals it in beauty, and it may be cultivated by any one who will imitate its natural locality by preparing a deep peaty soil for it. The same remark as to cultivation applies to all our species. Europe has but a single species, *C. calceolus*, which has a yellow lip netted with purple veins. The tropical and sub-tropical species and varieties of the greenhouse and stove are numerous; the best known of these is *C. insigne*, from Nepal, which has thick dark green leaves, and flowers spotted and mottled with yellow, green, and purple. An old plant of this forms a large clump with numerous flowers, which keep in perfection for several weeks; it is well suited to the greenhouse or conservatory, as is the somewhat similar *C. venustum*, which has broader and spotted leaves.

**LÆKEN**, a village of Belgium, a suburb of Brussels, with a royal palace built in 1782 by the Austrian princess Maria Christina. After the invasion of the French in 1792 it was to be converted into a hospital; but the archduke Charles acquired the property from his aunt, and sold it about 1794 to a surgeon. Napoleon bought it in 1806 for 500,000 francs, for Josephine, and in 1811 he resided here for some time with Maria Louisa. In 1812 he exchanged it for the Élysée Bourbon. Subsequently it became the property of Belgium, and the royal family reside here occasionally. Malibran is buried in the cemetery of Laeken, where her husband De Bériot had a monument erected to her by the sculptor Geefs. In the parish church are the tombs of Queen Louise and King Leopold I., and an extensive Gothic building is in course of erection as a vault for the royal family. The *allée verte* extends nearly all the way from Laeken to Brussels.

**LÆLIUS. I. Caius**, a Roman general, born about 235 B. C. He commanded the fleet which captured New Carthage, in Spain, 210 B. C. He was the friend of Scipio, and commanded the left wing of his army at the battle of Bœcula, 208, and afterward with a detachment of the fleet defeated Adherbal in the straits. He was sent twice to the court of Syphax. Near the close of the second Punic war he sailed with a portion of the fleet to the African coast, landed at Hippo Regius, and began to plunder the country, but soon returned to Messana, from an apprehension that the Carthaginians were cutting off his retreat. In 204, with Masinissa, he burned the Punic and Numidian camps and pursued Hasdrubal and Syphax, and in 203 captured the latter and his capital Cirta. He commanded the Italian cavalry at the battle of Zama, and his charge determined the victory. He was chosen prætor in 196, and consul in 190. Afterward he obtained the province of Cisalpine Gaul, which he held for two years, and was sent on several important missions by the senate. The date of his death is unknown. **II. Caius Sapiens**, a Roman statesman, son of the preceding, born about 186

B. C., died about 115. He was tribune of the people in 151, prætor in 145, and consul in 140. Before his consulship he was assigned the province of Lusitania, and conducted a successful campaign against the formidable guerilla chief Viriathus. At the beginning of his political career Lælius inclined to that party which sought to raise the masses to the condition of landed proprietors; but the excitement and violence occasioned by the measures of the elder Gracchus so alarmed him that he withdrew from the popular side, and supported the aristocracy. In 132 he aided the consuls against the partisans of Tiberius Gracchus, and in 130 he opposed the passing of the Papirian rogation. For his course in that period, his friends and faction honored him with the cognomen of *Sapientis*, or the Wise. In common with the younger Scipio, he had early applied himself to the language and learning of Greece, and had imbibed the doctrines of the Stoics from Diogenes of Babylon and Panætius. He is the Lælius of Cicero's *De Amicitia*, *De Senectute*, and *De Republica*.

**LAEMLEIN, Alexandre**, a French painter, born at Hohenfeld, Bavaria, Dec. 9, 1813. He went to Paris in his 10th year, to live with his uncle Alexandre Laemlein, the author of a cyclopædia of chess, and became a naturalized French citizen in 1848, and professor of drawing at the special school of design in 1855. His works include many historical portraits at Versailles, and many large paintings, as "The Chastity of Joseph," "The Awakening of Adam," and "Tabitha resuscitated by St. Peter." The last was purchased by the government for the church of Saint Pierre de Gobert near Agen, where it has become a shrine for pilgrims. His "Charity," "Jacob's Ladder," and "Vision of Zacharias" are all powerful paintings, which were much admired at the exhibition of 1855. Among his later works are "Music" (1852), "Diana and Endymion" (1857), "Job" (1857), "The Love of Angels" (1863), "Orpheus" (1866), and "Hope" (1868).

**LAENNEC, René Théodore Hyacinthe**, a French physician, born in Quimper, Brittany, Feb. 17, 1781, died there, Aug. 13, 1826. In 1800 he went to Paris, and attached himself to the clinical school of the charity hospital, then directed by Corvisart. He obtained the degree of M. D. in 1814, and became principal editor of the *Journal de Médecine*. In 1816 he was appointed chief physician of the Necker hospital, where he soon after discovered mediate auscultation; and in 1819 he published his *Traité de l'auscultation médiate et des maladies des poumons et du cœur* (translated by Dr. Forbes of Chichester). In 1821 he was appointed professor of medicine in the collège de France, but ill health soon compelled him to resign.

**LAER, or Laar, Pieter van**. See BAMBOCOCCIO.

**LAFARGE, Marie Cappelle**, a French woman notorious for her condemnation as a poisoner, born at Villers-Hellon, Aisne, in 1816, died at Ussat, a watering place in the Pyrenees, Nov.

7, 1852. She belonged to a good family, and was accustomed to all the refinements of Parisian life. In 1838 she married Pouch-Lafarge, an owner of iron works at Glandier, in the department of Corrèze, who represented himself as a wealthy country gentleman; but being disappointed in her expectations, she quarrelled with him and exhibited the utmost rancor toward him. After about 16 months her husband was seized with a strange illness, and within a fortnight he died. Strong suspicion fixed upon Madame Lafarge, who, it was proved, had twice purchased arsenic under pretence of killing rats. She was arrested, and when in confinement was charged by one of her relations with having stolen a set of diamonds; and these having been found in her possession, she was sentenced to two years' imprisonment (April, 1840). Not daunted by this, she represented herself as the victim of a deep-laid conspiracy, and declared her innocence of both robbery and poisoning. The public at home and abroad became interested in her case. She secured the services of three eminent advocates; and the evidence against her was so slight that a verdict of acquittal was confidently expected, when the celebrated Orfila, who had made a chemical examination of the body of the deceased, reported evidences of poison. Madame Lafarge was found guilty and sentenced to hard labor for life (September, 1840). Public opinion was still divided. The chemist Raspail impugned the report of Orfila, and a bitter controversy ensued. The convict, incarcerated at Montpellier, published her *Mémoires* (4 vols. 8vo, 1841-'2), and continued to receive marks of sympathy. After five years of imprisonment she was permitted to remove to the convent of St. Rémy, and the interest manifested in her behalf on account of her failing health contributed to procure her liberation in June, 1852. She removed to Ussat, where she soon died protesting her innocence. Her *Heures de prison*, containing her thoughts during her confinement, was published after her death (3 vols. 8vo, 1853).

**LA FARINA, Giuseppe**, an Italian author, born in Messina in 1815, died in September, 1863. He early wrote in the liberal interest, and fled from Sicily in 1837; being again molested after his return there in 1839, he resided in Florence till 1848, when he became a member of the Sicilian parliament and cabinet under the republican government, retiring to Turin in 1849. In 1861 he was elected to the Italian parliament as a representative of Palermo, and Rattazzi appointed him president of the national Italian society. His works include illustrated books of travel, "Souvenirs of Rome and Tuscany," several dramas, and histories of the Sicilian revolution of 1848-'9 (2 vols.) and of Italy from 1815 to 1850 (6 vols.), the latter being his most important publication.

**LAFAYE, or Lafait, Prosper**, a French painter, born at Mont Saint-Sulpice, Yonne, in 1806. He was at first a landscape and subsequently

a historical painter. Many of his works are at Versailles, including "The Masked Ball," one of his best. At the exhibition of 1855 he showed two paintings illustrating the maxims of La Bruyère. For more than 20 years he has been almost exclusively occupied in the decoration of windows.—His brother, PIERRE BENJAMIN (1808-'67), published *Synonymes français* (1841), for which he received a prize, and *Dictionnaire des synonymes de la langue française* (1858; supplement, 1865).

**LAFAYETTE**, the name of six counties in the United States. **I.** A N. county of Florida, bordering on the gulf of Mexico, and bounded E. and N. E. by the Suwannee river; area, 900 sq. m.; pop. in 1870, 1,783, of whom 197 were colored. The surface is level. The chief productions in 1870 were 28,455 bushels of Indian corn, 10,180 of sweet potatoes, 192 bales of cotton, 12 hogsheads of sugar, and 3,269 gallons of molasses. There were 200 horses, 2,020 milch cows, 4,198 other cattle, and 5,619 swine. Capital, McIntosh. **II.** A N. county of Mississippi, drained by Tallahatchee river and its tributary the Yocknapatafka; area, 790 sq. m.; pop. in 1870, 18,802, of whom 7,983 were colored. It has a rolling surface, covered in places with small tracts of timber. The soil is fertile. The Mississippi Central railroad passes through it. The chief productions in 1870 were 17,864 bushels of wheat, 470,305 of Indian corn, 23,772 of sweet potatoes, and 9,007 bales of cotton. There were 2,334 horses, 2,322 mules and asses, 4,515 milch cows, 1,016 working oxen, 6,832 other cattle, 6,281 sheep, and 31,514 swine; 2 tanneries, 2 currying establishments, 7 saw mills, and 1 wool-carding establishment. Capital, Oxford. **III.** A S. parish of Louisiana, traversed by Vermilion river, which is navigable by steamboats; area, 350 sq. m.; pop. in 1870, 10,388, of whom 4,755 were colored. The surface is level and the soil rich and alluvial. The principal productions in 1870 were 238,020 bushels of Indian corn, 47,043 of sweet potatoes, 14,385 lbs. of wool, 40,166 of butter, 221,600 of rice, 6,234 bales of cotton, 128 hogsheads of sugar, and 6,715 gallons of molasses. There were 4,322 horses, 944 mules and asses, 4,804 milch cows, 1,883 working oxen, 10,171 other cattle, 6,881 sheep, and 6,814 swine; 9 manufactories of carriages, 6 of molasses and sugar, and 2 saw mills. Capital, Vermillionville. **IV.** A S. W. county of Arkansas, bordering on Louisiana and Texas, and traversed by Red river and its Sulphur fork; area, 1,260 sq. m.; pop. in 1870, 9,139, of whom 5,158 were colored. It has a good soil and a level surface, consisting partly of prairie. The chief productions in 1870 were 247,004 bushels of Indian corn, 22,303 of sweet potatoes, and 9,572 bales of cotton. There were 1,406 horses, 1,476 mules and asses, 2,779 milch cows, 3,494 other cattle, 1,392 sheep, and 11,466 swine. Capital, Lewisville. **V.** A S. W. county of Wisconsin, bordering on Illinois and drained by Fèvre and Pekatonica

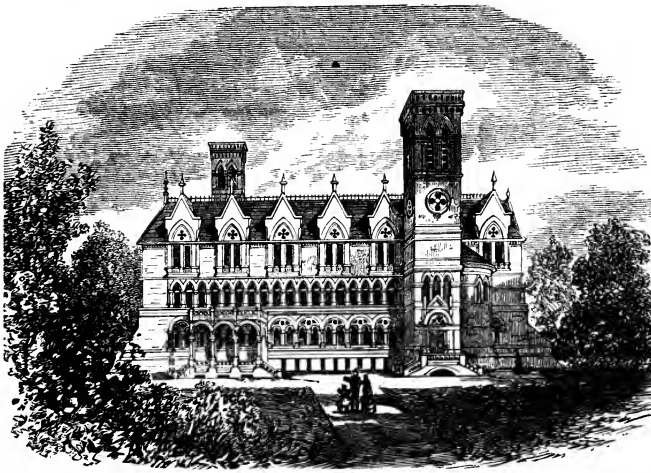
ivers; area, 630 sq. m.; pop. in 1870, 22,659. It has an undulating surface, thinly timbered. In the N. W. part are several regular hills called the Platte mounds. Lead, copper, and limestone are abundant. The soil is fertile. The Mineral Point railroad crosses the county, and the northern division of the Illinois Central skirts the southern border. The chief productions in 1870 were 516,900 bushels of wheat, 1,294,453 of Indian corn, 1,519,202 of oats, 75,802 of barley, 198,327 of potatoes, 33,538 of flax seed, 65,089 lbs. of wool, 689,335 of butter, 22,760 of cheese, and 38,749 tons of hay. There were 10,353 horses, 10,461 milch cows, 18,412 other cattle, 18,770 sheep, and 35,482 swine; 14 manufactories of carriages, 2 of pig lead, 5 of saddlery and harness, and 6 flour mills. Capital, Darlington. **VI.** A W. county of Missouri, bounded N. by the Missouri river and drained by a number of small streams; area, 450 sq. m.; pop. in 1870, 22,622, of whom 4,039 were colored. The Lexington branch of the Missouri Pacific railroad passes through it. The surface is undulating and well timbered. Limestone, sandstone, and coal are abundant, and the soil is remarkably fertile. The chief productions in 1870 were 421,567 bushels of wheat, 1,576,126 of Indian corn, 268,881 of oats, 91,345 of potatoes, 113,735 lbs. of tobacco, 33,100 of wool, 154,045 of butter, and 7,292 tons of hay. There were 6,983 horses, 2,760 mules and asses, 5,541 milch cows, 11,237 other cattle, 12,244 sheep, 33,334 swine, and a number of manufactories. Capital, Lexington.

**LAFAYETTE**, a city and the county seat of Tippecanoe co., Indiana, at the head of navigation on the E. bank of the Wabash river, 60 m. N. W. of Indianapolis; pop. in 1850, 6,129; in 1860, 9,387; in 1870, 13,506, of whom 3,639 were foreigners; in 1874 estimated by local authorities at 22,000. It is built on rising ground, enclosed in the rear by hills of easy ascent, commanding a fine view of the river valley. It contains many handsome buildings, and has paved streets lighted with gas. Near the centre of the city is a public square containing an artesian well 230 ft. deep, from which issues sulphur water possessing curative properties. To the north and northeast are Greenbush and Springvale cemeteries, handsomely situated and adorned with trees. The battle ground of Tippecanoe, where Gen. Harrison defeated the Indians, Nov. 7, 1811, is 7 m. N. of the city; and just S. of the limits are the agricultural fair grounds of the county. Lafayette is on the line of the Wabash and Erie canal, and at the intersection of the Lafayette, Muncie, and Bloomington, the Cincinnati, Lafayette, and Chicago, the Louisville, New Albany, and Chicago, the Indianapolis, Cincinnati, and Lafayette, and the Toledo, Wabash, and Western railroads, by means of which and the river it commands the trade of a rich and extensive country. There are a number of important manufactories, embracing founderies and ma-

chine shops, ornamental iron works, breweries, marble works, flouring mills, plough works, reaper works, woollen mills, pump factories, cooperages, &c. Pork packing is extensively carried on. There are five national banks, with an aggregate capital of \$2,505,000, and two savings banks. The city is divided into six wards, is governed by a mayor and council of 12 members, and has a police force and a fire department. The county jail, erected in 1869 at a cost of \$95,000, is a substantial structure. The city contains several hotels, a home for the friendless, and an opera house which cost \$62,000. Lafayette is the seat of Purdue university, named in honor of John Purdue, who gave it \$150,000 and 100 acres of land. It also received the proceeds (\$212,238) of the congressional land grant for a state college of agriculture and the mechanic arts, and the state and county have aided it by donations amounting to \$110,000. The buildings already

of the American revolution and a French statesman, born at the château of Chavagnac, near Brioude, Sept. 6, 1757, died in Paris, May 20, 1834. His family was one of the most ancient and eminent in the French nobility. His father, the marquis de Lafayette, was an officer of the army, and fell in battle in Germany at the age of 25. His mother died soon afterward, and he was thus left in infancy heir to a large estate. At an early age he was sent to the college of Plessis at Paris, and when only 16 married a lady still younger, a daughter of the count d'Ayen, son of the duke de Noailles. He entered the army as an officer of the guards, and in 1776 was stationed at Metz with his regiment, in which he was a captain of dragoons. At a dinner given by the commandant of the garrison to the duke of Gloucester, brother of the king of England, who was then on a visit to Metz, Lafayette heard that the American colonies had declared their independence. Be-

fore he left the table he had mentally resolved to draw his sword in the cause of American liberty, and he immediately went to Paris to make arrangements for the execution of his plan. He became acquainted with the American agents in Paris, Franklin, Deane, and Arthur Lee, and communicated to them his intention of proceeding to America. This was at the darkest period of the revolutionary war, and the news had just reached France of the occupation of New York, the loss of Fort Washington, and the disastrous



Purdue University Building.

erected, at a cost of \$110,000, are the dormitory, boarding house, laboratory, gymnasium, military hall, manufacturing shop, power and gas house, and janitor's residence. The university building proper is in process of construction, and will cost \$75,000. The institution has 184 acres of land connected with it. St. Mary's academy (Roman Catholic) has about 300 pupils, and there are several other Catholic schools. There are five public school buildings, the Ford school house, erected in 1869 at a cost of \$85,000, being the finest. The young men's Christian association has a free reading room and library. Three daily, one semi-weekly (German), and four weekly newspapers are published, and there are 24 churches.—Lafayette was laid out in 1825, and received a city charter in 1857. It is becoming a favorite place of resort for invalids and tourists.

**LAFAYETTE, or La Fayette, Marie Jean Paul Roch Yves Gilbert Motier, marquis de, a general**

retreat of the Americans through New Jersey. The cause of America looked desperate, and the few friends whom Lafayette had apprised of his design urged him to abandon it. Even the American commissioners told him they could not in conscience urge him to go; they had not the means even to give him a passage across the Atlantic. But he replied that the more desperate were the affairs of the Americans, the more necessary was there for giving them assistance; and as for passage, he would purchase a vessel for himself and his companions. He accordingly caused a vessel to be secretly fitted out at Bordeaux. While his preparations were going on, to avert suspicion from himself, he made a visit to his kinsman the marquis de Noailles, then French ambassador in London; but while in Great Britain he scrupulously abstained from using the opportunity afforded of obtaining military information that might be of service to the Ameri-



cans. At the end of three weeks he returned to France, and without passing through Paris hastened to Bordeaux. Here he learned that the British ambassador at Paris had penetrated his design, and that the government had given orders for his arrest. Though his ship was not quite ready, he instantly made sail for Pasages, the nearest port in Spain, where he had scarcely arrived when he was waited upon by two French officers with an order from the king of France directing him to go to Marseilles. They also brought letters from his relatives censuring his conduct, and requesting him to return home; but his wife, who was devotedly attached to him, and who shared his enthusiasm for American liberty, wrote urging him to stand firm and to proceed on his enterprise. He returned with the officers to Bordeaux by land, leaving his vessel at Pasages, and in apparent obedience to the royal command set out for Marseilles; but soon after leaving Bordeaux he took the road to Spain, and, though closely pursued, reached Pasages, where he instantly put to sea. He was accompanied by 11 officers, among them the German veteran Baron de Kalb. His departure created a great sensation not only in France but in England. The passage to America was long and stormy, and there was much danger from the English cruisers on the coast. Lafayette and his companions, however, landed in the night near Georgetown, S. C., and, though at first taken for a party of the enemy, were at length received and hospitably entertained in the house of Major Huger, who conveyed them the next day, April 25, 1777, to Charleston, where they were received with enthusiasm. "The sensation produced by his appearance in this country," says Mr. Ticknor, "was, of course, much greater than that produced in Europe by his departure. It still stands forth as one of the most prominent and important circumstances in our revolutionary contest; and, as has often been said by one who bore no small part in its trials and success, none but those who were then alive can believe what an impulse it gave to the hopes of a population almost disheartened by a long series of disasters." Lafayette proceeded by land to Philadelphia, where congress was then in session, and on his arrival addressed a letter to the president of that body, asking leave to enter the army as a volunteer and to serve without pay. Congress expressed its high sense of the value of his example and of his personal worth by the following resolution: "Whereas the marquis de Lafayette, out of his great zeal to the cause of liberty, in which the United States are engaged, has left his family and connections, and at his own expense come over to offer his services to the United States, without pension or particular allowance, and is anxious to risk his life in our cause: Resolved, that his services be accepted, and that, in consideration of his zeal, illustrious family and connections, he have the rank and

commission of major general in the army of the United States." His commission was dated July 31, 1777, while he yet lacked more than a month of being 20 years old. Congress considered the appointment merely honorary; but it speedily became apparent that Lafayette was bent on serious service, and was well qualified to command. Washington and Lafayette met for the first time at a dinner party in Philadelphia. Lafayette made a highly favorable impression, and at the close of the entertainment Washington took him aside, thanked him warmly for the sacrifices he had made in the American cause, and invited him to regard himself at all times as a member of his military family. The personal acquaintance thus commenced soon ripened into an intimacy that was never for a moment interrupted. The private correspondence of Washington shows that he not only felt for Lafayette the warmest affection, but entertained the highest opinion of his military talent, personal probity, and general prudence and energy. The youthful major general was first in active service at the battle of Brandywine, Sept. 11, where he had no separate command, but was attached to the staff of Washington as a volunteer. He plunged into the hottest of the fight, and when the defeated Americans began to retreat, threw himself from his horse, entered the ranks, and exerted himself to rally them. He was shot by a musket ball through the leg, but was unconscious of the wound till his aide told him that the blood was running from his boot. He rode with a surgeon to Chester, but would not suffer his wound to be dressed till he had restored order among the troops who were retreating in confusion through the village. It was two months before his hurt was sufficiently healed to enable him to join the army. On Dec. 1 congress resolved "that Gen. Washington be informed that it is highly agreeable to congress that the marquis de Lafayette be appointed to the command of a division in the continental army." This resolve was passed at the request of Washington himself, who three days afterward directed Lafayette to take command of the division of Gen. Stephen, who had been dismissed. About this period the board of war, of which Gates was the head and which had been created and was controlled by the faction hostile to Washington, planned an expedition to Canada which was approved by congress; and Lafayette was appointed to the command in the expectation that so flattering a distinction would attach him to the party by whom it was conferred. The first intimation that Washington had of the project was from the letter to Lafayette announcing his appointment. The young Frenchman, indignant at the slight offered to his chief in not consulting him, carried the letter immediately to Washington, told him he saw through the artifice, and would be governed by his advice. Washington advised him to accept the appointment, but told him he did not know where the means could



be found to carry out such an expedition. Lafayette accordingly accepted the command, and proceeded to Albany, the designated headquarters of the expedition; but after waiting three months for the promised force and supplies, during which period he took measures for putting the Mohawk valley in a state of defence, he at length received orders from congress to join the army at Valley Forge, and to suspend the invasion of Canada. He returned to the camp in April, 1778, and on May 18 was despatched by Washington from Valley Forge to Barren Hill, 12 m. distant, where he took post with 2,100 men and five pieces of cannon. Sir Henry Clinton, the British commander at Philadelphia, on the night of May 19 sent Gen. Grant with 5,000 men to surprise Lafayette. The negligence of the militia outposts permitted the British to approach within a mile before they were discovered, and early in the morning Lafayette found himself nearly surrounded. But a dexterous stratagem and a skilful movement, promptly conceived and executed, baffled the British general, and conveyed the Americans with their artillery safely across the Schuylkill and back to Valley Forge. His conduct in this affair called out the warmest expressions of approbation from Washington. At the battle of Monmouth, June 28, Gen. Lee, to whom as next in rank to the commander-in-chief the command of the advanced forces belonged, refused at first to take it, and Washington gave it to Lafayette; but Lee subsequently changed his mind and applied to be reinstated, to which Lafayette assented with his accustomed grace and disinterestedness, and served under Lee during the battle, in which he displayed great gallantry. Seeing at one point of the engagement a good opportunity to attack the enemy with his division, he rode up to Lee and asked permission to make the attempt. "Sir," replied Lee, "you do not know British soldiers; we cannot stand against them." Lafayette replied: "It may be so, general; but British soldiers have been beaten, and they may be again; at any rate I am disposed to make the trial." Lee gave him permission to attack, which he did with vigor and success until Lee, on beginning the "unnecessary, disorderly, and shameful retreat" for which he was afterward punished by court martial, ordered him to fall back. A few weeks later Lafayette was sent with two brigades of infantry to assist Gens. Greene and Sullivan in the attempt to drive the British from Rhode Island, in which they had at first the assistance of a French fleet under Count d'Estaing, France having now declared war against England and formed an alliance with the United States. D'Estaing, however, before anything of importance was effected, withdrew with his fleet to Boston harbor for repairs, in spite of the remonstrances of the American generals. Lafayette was despatched to Boston to persuade him to return to Newport, but could only get a promise from him that if required he would march his marines by land to

the aid of the Americans. During Lafayette's absence an engagement took place, Aug. 29; and though he rode from Boston to Rhode Island, 70 m., in 6½ hours, he arrived only in time to assist in conducting the retreat from the island, which the American commanders had decided upon, on learning of the approach of the British fleet with a fresh army on board. The good understanding between the French and American troops had been somewhat impaired by the conduct of D'Estaing, and Lafayette was of essential service in restoring harmony.—His own country being now at war, Lafayette, who still retained his commission in the French army, deemed it his duty at the end of the campaign of 1778 to return to France and place himself at the disposal of his government, and at the same time to exert himself in behalf of America by personal conferences with the French ministry. At the request of Washington, congress granted him leave of absence, accompanied by complimentary resolutions, and by a letter recommending him to the good offices of the American minister in Paris. Congress also voted him a sword. After a detention at Fishkill by severe illness, he embarked for France at Boston in January, 1779. He was received with extraordinary demonstrations of popular enthusiasm by all classes of society. His name, introduced into dramatic performances, called out acclamations at the theatres; he was followed by crowds in the streets wherever he went; he made a journey to one of his estates in the south of France, and all the towns through which he passed received him with processions and civic honors; and in the city of Orleans he was detained nearly a week by prolonged festivities in honor of his return. Amid the admiration and flattery with which he was surrounded he did not neglect the interests of America. It was mainly his personal efforts that caused the army of Rochambeau to be sent to America. "It is fortunate for the king," said the old count de Maurepas, the head of the ministry, "that Lafayette did not take it into his head to strip Versailles of its furniture to send to his dear America, as his majesty would have been unable to refuse it." Having procured for the United States assistance both with men and money, Lafayette, on May 11, 1780, rejoined Washington at the headquarters of the army, bringing himself the first intelligence of his success. He brought also a commission from Louis XVI. appointing Washington a lieutenant general of the army of France and vice admiral of its navy, a measure intended, as it afterward operated, to prevent difficulties respecting official etiquette between the French and American commanders. A French fleet bringing Rochambeau and 6,000 soldiers arrived at Newport July 10, and Washington despatched Lafayette to concert measures with Rochambeau for future operations. Soon after his return he was stationed at Tappan on the Hudson in command of six battalions of light

infantry, watching the movements of the British under Sir Henry Clinton, with whom Arnold, then in command at West Point, was secretly negotiating for the betrayal of that important fortress. Arnold made an attempt to obtain from Lafayette the names of the spies he maintained in New York city, on pretence that intelligence from them might often be conveyed more expeditiously by way of West Point; but Lafayette declined to communicate them. Lafayette was one of the court of 14 general officers, convened at Tappan, Sept. 29, by whom Major André was tried as a spy and condemned to death. During Arnold's invasion of Virginia in the beginning of 1781, Washington sent Lafayette, Feb. 20, with 1,200 men of the New England and New Jersey lines, to assist in the defence of that state. They arrived at Annapolis in a state of great destitution, without shoes, hats, or tents. The United States having neither money nor credit, he purchased for them a full supply with his own funds. His presence inspired the militia of Virginia with fresh hope, and his force was soon doubled in numbers. Toward the end of May Lord Cornwallis took command of the British in Virginia, and, with his usual energy, on the fourth day after his arrival he marched to attack Lafayette, who with about 3,000 troops was then encamped in the neighborhood of Richmond. Confident in his superiority of numbers, Cornwallis was so sure of success that he wrote home, "The boy cannot escape me." Lafayette, however, made a skilful retreat to the northward, and, though pursued with unusual activity, made his way safely to the Raccoon ford on the Rappahannock in Culpeper county, where he was joined by Gen. Wayne, who had marched from Maryland to his assistance with 800 men. Lafayette then advanced, and interposed himself in a strong position near Charlottesville between the British army and some large quantities of stores removed from that town on the enemy's approach. Cornwallis marched off toward Williamsburg, pursued by Lafayette, a portion of whose troops overtook the British, July 6, at the Jamestown ford, where a sharp action was fought. Continuing his retreat, Cornwallis at last took post at Yorktown. Lafayette stationed his army so as to cut off their retreat into the Carolinas, and awaited the reinforcements from the north, which came a few weeks later under the command of Washington and Rochambeau. For his services during the siege of Yorktown, where in conjunction with Hamilton he commanded one of the assailing parties, he was publicly thanked by Washington on the day after the surrender of Cornwallis.—At the close of the campaign he returned to France. In granting him leave of absence, congress passed resolutions acknowledging his eminent services, and directing all the ministers of the United States in Europe to confer and correspond with him. He was received with the highest enthusiasm

in France, and his request for additional men and money for service in America was readily complied with. The enthusiasm spread from France to Spain, and an expedition of 60 vessels of the line and 24,000 troops was organized to sail from Cadiz under the command of Lafayette, who led 8,000 men from Brest to Cadiz. Soon after his arrival he heard of the conclusion of peace at Paris; and from a letter which he sent from Cadiz, Feb. 5, 1783, congress first learned the news of the treaty. In 1784, at the invitation of Washington, he revisited the United States, landing at New York Aug. 4, and proceeded almost immediately to Mount Vernon. He subsequently visited Annapolis, Baltimore, Philadelphia, New York, Albany, and Boston, receiving everywhere the warmest testimonials of affection and respect. On his departure in December, congress appointed a solemn deputation of one member from each state to take leave of him on behalf of the whole country. In the year after his return to France he visited Germany, where he was received with much distinction. Frederick the Great paid him marked attention, and took him with him on a military tour of inspection and review. For some years he now occupied himself with efforts to ameliorate the political condition of the French Protestants, and in promoting the abolition of slavery in the colonies. He purchased a plantation in Cayenne, emancipated the slaves, and expended a large sum in their education. The assembly of the notables at Paris, Feb. 22, 1787, was the first step in the French revolution. Of that assembly Lafayette was a member, and contributed essentially to give character to its deliberations. He stepped forth at once the champion of the people, denounced the abuses of the government, proposed the abolition of private arrests and of the prisons of state, the restoration of Protestants to equal privileges of citizenship, and the convocation of the states general. "What!" said the count d'Artois, the brother of the king, and afterward king himself as Charles X., "do you demand the states general?" "Yes," replied Lafayette, "and something better than that." The states general, which soon became the constituent assembly, met May 5, 1789. According to Jefferson, its initiatory movements were concerted by Lafayette and a small circle of friends at the hotel of Jefferson himself. He proposed in this body a declaration of popular rights not unlike that of the American declaration of independence; and by his influence on the night of July 13, while the Bastille was falling before the people, the decree providing for the responsibility of the royal ministers was carried through. Two days afterward he was appointed commander-in-chief of the national guards of Paris, an organization which rapidly extended throughout the kingdom until it embraced 3,000,000 men. It was at his suggestion that the tricolor was adopted, July 26; an emblem destined, as he said, to make

the tour of the world. His influence was now at its height, and while he retained it, it was always exercised on the side of moderation, humanity, and constitutional liberty. A loyal subject, though in principle a firm republican, he defended the freedom of the king as sincerely as he had ever defended that of the people. His courage and coolness during the tumults of Oct. 5 and 6 saved the lives of the king and queen from a ferocious mob that had taken possession of the palace of Versailles. When the national assembly decreed the abolition of feudal titles, Lafayette was among the first to lay down that of marquis, which he never resumed; and the only title which he bore till his death was that of general, which he derived from his commission in the American army. After the splendid and imposing ceremony of the adoption of the constitution, July 14, 1790, in the Champ de Mars, where, in the presence of half a million of people, he took the oath to its support in the name of the nation, he resigned his command of the national guards in an able and patriotic letter, and retired to his estates in the country. When war was declared against Austria, March 20, 1792, he was appointed to the command of one of the armies sent to guard the frontier. He established discipline, and won victories at Philippeville, Maubeuge, and Florennes. But the Jacobins, who were now becoming predominant in France, hated and feared him, and orders were sent to the camp from the ministry of war designedly to embarrass and annoy him. In return he addressed a letter to the assembly denouncing the Jacobins as enemies of the constitution and the people. A majority of the assembly and the local assemblies of 75 of the departments gave their formal sanction to his views. But violence at length prevailed, and on Aug. 8 he was denounced in the assembly as an enemy of the nation, and a motion was made for his arrest and trial. After vehement debates it was lost by a majority of 406 to 224. But the terrible events of Aug. 10 soon followed, and the reign of terror was established. Commissioners were sent to the army with orders to arrest Lafayette. Arrest at that period was certain death. He saved himself by flight, after placing the army in such a position that his departure could not expose it to danger. He crossed the frontier Aug. 17, intending to take refuge in Holland. But he was seized the same night by an Austrian patrol, and being soon recognized was treated as a criminal and exposed to disgraceful indignities. He was handed over to the Prussians because their prisons were near at hand, and was at first confined at Wesel and afterward at Magdeburg. But the Prussians, unwilling to bear the odium of holding Lafayette a prisoner, soon transferred him again to the Austrians, who consigned him to damp and dark dungeons in the citadel of Olmütz. Here he was told that he would never again see anything but the four walls of his prison;

that he would never receive news of events or of persons; that his name would be unknown in the citadel, and that in all accounts of him sent to court he would be designated only by a number; that he would never receive any notice of his family, or of the existence of his fellow prisoners. At the same time knives and forks were kept from him, as he was officially informed that his situation was one which would naturally lead to suicide. The want of air and of proper food, and the dampness and filth of his dungeon, brought on dangerous diseases, of which his jailers took no notice; and at one time all his hair came off. His friends for a long time could get no intelligence of his fate; but at length Dr. Eric Bollmann, who was employed by Count Lally-Tolendal, and who had established himself for the purpose as a physician at Vienna, ascertained that he was confined at Olmütz. The military physician at Olmütz by this time had thrice made a formal representation to the Austrian government that Lafayette would die unless he was allowed to breathe a purer air. To the first application the reply was made that "he was not sick enough yet;" but at length the outcry of public indignation in Europe compelled the authorities to grant him permission to ride out occasionally in a carriage accompanied by two soldiers. Dr. Bollmann and a young American travelling in Austria, Francis K. Huger, then planned a rescue, which proved so far successful that Lafayette escaped from the prison, but through a misunderstanding rode in the wrong direction, was rearrested, and confined with redoubled severity. (See BOLLMANN.) Meantime his wife, who had been imprisoned at Paris during the reign of terror, obtained her liberty on the downfall of Robespierre. She then went to Vienna, obtained with difficulty a personal interview with the emperor Francis, and gained permission to share her husband's captivity, under the hardship of which her health soon became so impaired that she never fully recovered from its effects. Great exertions were now made both in Europe and America to obtain the release of Lafayette. In the house of commons Gen. Fitzpatrick, Dec. 16, 1796, made a motion in his behalf, which was supported by Col. Tarleton, who had fought against Lafayette in America, by Wilberforce, and by Fox. President Washington wrote a letter to the emperor, asking for the liberation of his old companion in arms. The Austrian government was deaf to all entreaties. But an advocate now appeared whose plea was irresistible. Bonaparte at the head of his victorious army demanded the release of Lafayette in the preliminary conferences held at Leoben before the treaty of Campo Formio. He was often afterward heard to say that in all his negotiations with foreign powers he had never experienced so pertinacious a resistance as that which was made to this demand. The Austrian negotiators attempted to compel Lafayette to receive

his freedom clogged with conditions; but he firmly replied that he would never accept his liberation in any way that should compromise his rights and duties, either as a Frenchman or as an American citizen. He was set free at last, Sept. 19, 1797, after five years of imprisonment, 22 months of which had been shared by his wife. The unsettled condition of France still precluded his return to his native country, and he took up his residence in Holstein, where he lived in retirement, occupying himself with agriculture, until toward the end of 1799, when he removed to his estate of La Grange, a fine old château about 40 m. from Paris. Here he lived quietly, still occupied with agriculture and holding steadfastly to his republican convictions. Napoleon in a personal interview endeavored in vain to persuade him to take the post of senator. He also offered him the cross of the legion of honor, but Lafayette rejected it with disdain, calling it an absurdity. When the question was submitted to the people whether Napoleon should be first consul for life, Lafayette voted in the negative, and informed Napoleon of the fact in a letter, which put an end to their intercourse. Nothing could tempt him from his retirement. President Jefferson offered to appoint him governor of Louisiana, then just become a territory of the United States; but he was unwilling by quitting France to appear to abandon the cause of constitutional freedom on the continent of Europe. During the hundred days after the return from Elba, when Napoleon granted to the people an elective house of representatives, Lafayette again appeared in public. He was chosen a representative and took his seat in the chamber, refusing a peerage which the emperor offered him. On the first ballot for president of the house he had the highest number of votes; but he declined the honor, and exerted himself for the election of Lanjuinais. He took little part in the debates till after Napoleon's return from Waterloo, when he took the lead in demanding the emperor's abdication. Lucien, the brother of Napoleon, opposed the motion to this effect in a speech of great power and eloquence. He denounced the proposition as a signal instance of inconstancy and national ingratitude. Lafayette arose, and, contrary to rule and custom, spoke from his place and not from the tribune. "The assertion which has just been uttered," he said, "is a calumny. Who shall dare to accuse the French nation of inconstancy to the emperor Napoleon? That nation has followed his bloody footsteps through the sands of Egypt and through the snows of Russia; over fifty fields of battle; in disaster as faithfully as in victory; and it is for having thus devotedly followed him that we now mourn the blood of three millions of Frenchmen." These few words made an impression on the assembly which could not be resisted; and as Lafayette ended, Lucien himself bowed respectfully to him and without resuming his speech sat down.

After the entry of the allies into Paris, Lafayette returned to La Grange. Touched with a sympathy for Napoleon in his adversity which he had not felt at the height of his power, he offered to procure him the means of escaping to America; but Napoleon could not forgive his former opposition, and refused to accept his assistance. In 1818 Lafayette was elected to the chamber of deputies, where he voted constantly for all liberal measures, and opposed the censorship of the press and everything that tended to infringe the constitutional rights of the people.—In 1824 the congress of the United States passed unanimously a resolution requesting President Monroe to invite Lafayette to visit the United States. He accepted the invitation, but declined the offer of a ship of the line for his conveyance, and with his son and secretary took passage on a packet ship from Havre to New York, where he landed on Aug. 15, 1824. His progress through the country resembled a continuous triumphal procession. He visited in succession each of the 24 states and all the principal cities. In December congress voted him a grant of \$200,000 and a township of land, "in consideration of his important services and expenditures during the American revolution." His hereditary fortune had been mostly lost by confiscation during the reign of terror. On Sept. 7, 1825, he sailed from Washington in a frigate named in compliment to him the Brandywine. On his arrival at Havre the people assembled to make a demonstration in his honor, but were dispersed by the police. In August, 1827, he pronounced a funeral oration over the body of Manuel, a distinguished member of the chamber of deputies. In November of the same year the chamber was dissolved, and Lafayette was reelected. During the revolution of July, 1830, he was appointed commander-in-chief of the national guards of Paris, and, though not personally engaged in the fight, his name and his experience and energy were of the greatest service to the liberal cause. His influence was successfully exerted to prevent the revolution from assuming a sanguinary character, and from proceeding to extremes which would have brought France into perilous collision with all the powers of Europe. He sacrificed his own republican preferences for the sake of peace and order, and placed Louis Philippe on the throne, "a monarchy surrounded by republican institutions." He soon resigned his commission as commander of the national guards, and confined himself to his duties as a representative of the people, and to the exercise of his moral influence as the acknowledged chief of the constitutional party on the continent of Europe. In attending in the winter and on foot the obsequies of a colleague in the chamber of deputies, he contracted a cold which settled on his lungs and caused his death. He received a magnificent funeral, and his body was buried, by his own direction, in the cemetery of Pic-

pus in the faubourg St. Antoine.—See “Eulogy on Lafayette, delivered in Faneuil Hall, Sept. 6, 1834,” by Edward Everett; and *Mémoires et manuscrits de Lafayette*, published by his family (6 vols. 8vo, Paris, 1837-'8). There are numerous biographies of him, both in French and English.

**LAFAYETTE COLLEGE**, an institution of learning at Easton, Pa., chartered in 1826. Situated in the great mining and manufacturing region of Pennsylvania, the college has special facilities for affording a scientific and industrial education. Besides the usual classical course, there is a general course in science, and the following special courses of four years each: 1, engineering, civil, topographical, and mechanical; 2, mining engineering and metallurgy; 3, chemistry. The “working sections” afford opportunities for combining theoretical instruction with practical operations in road and mining engineering, metallurgy and mineralogy, and chemistry. Post-graduate courses are also provided. Of the several college buildings, the most imposing is Pardee hall, completed in 1873, for the use of the Pardee scientific department, through the munificence of Mr. Ario Pardee of Hazleton, Pa., whose gifts to the college amount to nearly \$500,000. It is constructed of Trenton brown stone, with trimmings of light Ohio sandstone, and consists of a central building five stories high, 53 ft. front and 86 ft. deep, and a wing on each side 61 by 31 ft., four stories high; the whole terminating in two cross wings 42 ft. front and 84 ft. deep, making the front of the entire structure 256 ft. In 1874 there were 280 students and 28 instructors, of whom 16 were professors and 3 assistant professors. The college has valuable collections and apparatus, and a library of 8,200 volumes.

**LA FÈRE**, a town of France, in the department of Aisne, at the confluence of the Serre and the Oise, 13 m. N. W. of Laon; pop. in 1866, 3,122. It is strongly fortified, and has a school and bureau of artillery, an arsenal, and fine barracks. It was bombarded for two days by the Germans in 1870, and capitulated on Nov. 27, after an unsuccessful sortie, with 2,000 soldiers and 70 pieces of artillery.

**LAFFITTE, Jacques**, a French banker, born in Bayonne, Oct. 24, 1767, died in Paris, May 26, 1844. He was the son of a poor carpenter, but received a fair education. In 1788 he went to Paris, was admitted a clerk in the banking house of Perregaux, and at the end of a few years was made a partner. He at once became the leading spirit of the firm, and successfully extended the range of its operations. He was chosen one of the regents of the bank of France in 1809, member of the tribunal of commerce in 1813, and governor of the bank in 1814, holding the last post for five years. During the events of the two restorations his liberality was equally conspicuous with his integrity. In 1814 he advanced 2,000,000 francs to the pro-

visional government to relieve its embarrassment and secure the pay of the French army. In 1815 he made himself responsible for 600,000 francs, exacted by Blücher as a war contribution from the city of Paris. Meanwhile he was banker of both Louis XVIII. and Napoleon, and faithfully discharged his confidential duties toward them. When the latter finally left the capital, he placed in trust with Laffitte about 5,000,000 francs, which was afterward distributed according to his will. In 1816 he was elected to the chamber of deputies; and although he took his seat among the opposition, he was appointed member of a government committee on finance, and was instrumental in persuading the king to resist the imprudent tendencies of his adherents. In 1817 he was reelected; and in 1818, when the public credit was in danger, he prevented a commercial crisis by purchasing government stocks to the amount of several millions. He participated in the establishment of institutions for bettering the condition of the common people, among others of the savings bank of Paris; he opened his purse to old officers in reduced circumstances, relieved merchants on the verge of bankruptcy, and readily assisted even his political opponents. His political importance was increasing daily; his house became the rendezvous of the most eminent members of the opposition, either in the legislative chambers or in the public press; he was the friend of Béranger and the patron of Thiers. He embraced with ardor the cause of Louis Philippe, and pointed him out beforehand as the only man who could save the country in the event of a revolution. On the publication of the famous ordinances of July, 1830, he first tried to bring back Charles X. to a wiser line of policy; but his efforts being fruitless, he moved the organization of a provisional government, issued a proclamation in behalf of the duke of Orleans, proposed his appointment as lieutenant general of the kingdom, and brought about a reconciliation between him and Lafayette, thus preventing the latter from proclaiming the republic; and finally he had the duke chosen king of the French by 219 deputies, out of 252 present (Aug. 7). He was appointed minister of state, and, assuming the ministry of finance, was intrusted with the premiership, Nov. 3; but his sentiments were too liberal to suit the king, and he resigned in the following March. His banking business had suffered from his absence and the commercial difficulties consequent upon the revolution, his credit became impaired, and his exertions to prevent the fall of his firm were unavailing. He sold his property, and established a new banking house under the appellation of *banque sociale*, of which he was the manager; but his anticipations of success were not realized. He was elected again to the chamber of deputies in 1837 by one of the districts of Paris, reelected in 1839 and 1842 by the city of Rouen, and at the opening of the session of 1843-'4



presided over the chamber as its oldest member. His only daughter married the eldest son of Marshal Ney. Besides some financial and political essays which have been printed, Laffitte left *mémoires* which are still unpublished. *Les souvenirs de M. Laffitte, racontés par lui-même* (3 vols., 1844), written by Ch. Marchal, deserves little credit. There is an elegant biographical sketch of him, by Loménie, in the *Galerie des contemporains illustres*.

**LAFITAU, Joseph François**, a French missionary, born at Bordeaux in 1670, died there, July 3, 1746. He entered the society of Jesus at an early age, and, after distinguishing himself by his taste for literature and historical pursuits, was sent as a missionary to Canada in 1712. He was placed at the Iroquois mission at Sault St. Louis, where his room is still shown. Here he devoted himself to the study of the Indian type and character. In 1716 he discovered and identified the ginseng, the Chinese estimation of which was known. He returned to France the next year, and issued a *Mémoire présenté à son altesse royale Mgr. le duc d'Orléans, régent de France, sur la précieuse plante du ging-seng de Tartarie, découverte en Amérique* (Paris, 1718; Montreal, 1858), which led to a trade in ginseng between America and China. His studies of Indian life compared with that of ancient nations appeared after a visit to Rome in *Mœurs des sauvages américains comparées aux mœurs des premiers temps* (2 vols. 4to, 1724). He also wrote *Histoire des découvertes des Portugais dans le nouveau monde* (2 vols. 4to, 1733).

**LAFITTE, Jean**, a corsair, privateer, or smuggler of Louisiana and the gulf of Mexico, born in France, either at St. Malo, Marseilles, or Bordeaux, about 1780, died, according to some accounts, at sea in 1817, according to others, at Silan, Yucatan, in 1826. There is a singular uncertainty with regard to the events of his career. It has been stated that he never was at sea but twice—once when he came to America, and again in the voyage on which he was drowned; and that he fitted out privateers to cruise against Spanish commerce under the flag of Cartagena. Other authorities assert that he began life as mate of a French East Indiaman, but, quarrelling with the captain, left his ship at Mauritius and entered upon a course of daring and successful piracy in the Indian ocean, varied by occasional ventures in the slave trade. After several years he returned to France, disposed of his prizes, sailed for the West Indies, and took out a commission as privateer from the newly organized government of Cartagena (afterward New Granada), continuing his depredations, not only upon Spanish, but upon British commerce. Another account represents him as having begun his career as lieutenant of a French privateer, which was captured by a British man-of-war and taken into an English port, where the officers and crew of the privateer were thrown into prison. Here Lafitte was confined for several years under circum-

stances of peculiar hardship, after all his comrades had obtained their release. The resentment toward Great Britain engendered by this real or supposed severity is said to have been the motive that inspired his subsequent career. Unable to gratify this resentment in the service of his native country, on account of the suspension of hostilities at the time of his release, he found means of doing so under cover of a privateer's commission (against Spain) obtained from the Cartagenian government. According to this account—which bears some indications of authenticity in its general features—the only acts of Lafitte that could properly be designated as piratical were committed against British vessels. He is said to have gone to New Orleans in 1807; and whatever may have been the facts with regard to his early history, there is no doubt that in 1813-'14 he was at the head of an organized and formidable band of desperadoes, whose headquarters were on the island of Grande Terre, in Barataria bay, some 30 or 40 miles west of the mouth of the Mississippi. It is generally admitted that the operations of these adventurers were not restricted within the limits to which their commission would have confined them. Barataria bay afforded a secure retreat for their fleet of small vessels; and their goods were smuggled into New Orleans by being conveyed in boats through an intricate labyrinth of lakes, bayous, and swamps, to a point near the Mississippi river a little above the city. After various ineffectual presentments and prosecutions before the civil tribunals, an expedition was despatched against the Baratarians in 1814, under the command of Commodore Patterson. The settlement on Grande Terre was captured, with all the vessels that happened to be in port at the time; but Lafitte and his comrades made their escape among the swamps and bayous of the interior, from which they returned to the same rendezvous and resumed operations, as soon as Com. Patterson's forces had retired. About the same time the British, then maturing their plans for a descent upon the southern coast of the United States, made overtures to Lafitte for the purpose of securing his coöperation in that enterprise. A brig of war was despatched to Barataria, her commander bearing a letter from Commodore Percy, commanding the British naval forces in the gulf, and one from Col. Nichols, then in command of the land forces on the coast of Florida, offering Lafitte \$30,000 and the command of a fine ship, on condition of obtaining his services in conducting the contemplated expedition to New Orleans and in distributing a certain proclamation to the inhabitants of Louisiana. Lafitte dissembled with the British officer (Capt. Lockyer, of the *Sophia*) who was the bearer of these tempting proposals, and asked for time to consider them. Meantime he immediately wrote to Gov. Claiborne of Louisiana, enclosing the documents that had been handed him by Capt. Lockyer, informing the

governor of the impending invasion, pointing out the importance of the position that he occupied, and offering his services in defence of Louisiana, on the sole condition of pardon to himself and followers for the offences with which they stood charged. This amnesty would, of course, include in its provisions a brother of Jean Lafitte, who was then in prison in New Orleans under an indictment for piracy. After some hesitation on the part of the American authorities, Lafitte's offer was accepted. In connection with an officer of the army Lafitte was employed in fortifying the passes of Barataria bay, and rendered efficient service, in command of a party of his followers, in the battle of Jan. 8, 1815. The subsequent career of Lafitte is involved in as much obscurity as his earlier life. President Madison confirmed the amnesty which had been granted to all the Baratarians who had enlisted in the American service, though it does not appear that their chief ever received any further reward from the government. It is generally understood that he returned to his old pursuits and formed a settlement on the site of the present city of Galveston, which was broken up in 1821 by a naval force under the orders of Lieut. (afterward Commodore) Kearny; but it is possible that his brother Pierre, who commanded one of his vessels, has been confounded with him. Other authorities say that he was for a time after the war commander of a packet between Philadelphia and New Orleans. In person Lafitte is represented to have been well formed and handsome, about 6 ft. 2 in. high, with large hazel eyes and black hair. His manners were polished and easy, though retiring; his address was winning and affable; and his influence over his followers almost absolute. There is every reason for believing that he was of a respectable family, and that his early opportunities for education had been good.—See "De Bow's Review," vols. xi., xii., xiii., xix., and xxiii.; Marbois's "Louisiana;" Gayarré's "Louisiana;" Latour's "War in Louisiana;" Walker's "Jackson and New Orleans;" Yoakum's "History of Texas;" and Parton's "Life of Jackson."

**LA FLÈCHE**, a town of France, in the department of Sarthe, on the left bank of the Loir, in a beautiful valley, 25 m. S. W. of Le Mans; pop. in 1866, 9,292. It has a tribunal of primary jurisdiction, a chamber of agriculture, a theatre, an aqueduct, and a statue of Henry IV. which was unveiled in 1857. The large castle built by Henry IV., which is surrounded by a magnificent park and contains a picture gallery and a library of about 20,000 volumes, now serves as a military school. The town has an active trade in grain, wine, leather, cattle, and fowls. In December, 1793, the royalists were defeated here by the republican troops under Westermann. The Jesuit college of La Flèche was long celebrated, and among its students were some very eminent men. The town suffered much during the war of La Vendée.

**LAFONT, Pierre Chéri**, a French actor, born in Bordeaux in 1801, died in Paris, April 19, 1873. He began life as a surgeon in the navy, went to Paris in 1822, and made his début at the Vaudeville in 1823. From 1839 to 1849 he achieved brilliant successes at the Variétés as the chevalier de St. Georges and in other plays. In 1855 he resumed his connection with the Vaudeville, and in 1859 appeared at the Gymnase, when his personation of the marquis in *Les Ganaches* (1862) and of Raoul in *Montjoye* (1863) increased his reputation. His more recent successes were won in *Kabagas* and *Le centenaire*. He was a comic actor of singular elegance and grace, and was as popular in London as in Paris.

**LA FONTAINE, Jean de**, a French fabulist, born in Château-Thierry, July 8, 1621, died in Paris, April 13, 1695. He received an irregular education, partly at home, partly at the college of Rheims, and in 1641 entered the seminary of the Oratorians with the design of becoming a priest; but at the end of 18 months he returned home, and led an idle and dissipated life, which gave little promise of his future celebrity. He showed however considerable poetical talent, and this was fully awakened on his hearing the recitation of one of Malherbe's odes. He began eagerly to read the ancient and modern poets and prose writers. In order to reclaim him from his loose habits and apparent idleness, his father induced him to marry in 1647, and resigned to him his own office of master of waters and forests; but Jean was ill fitted for either a husband or a functionary, and was equally neglectful of his matrimonial and official duties. In 1654 he published at Rheims a translation in verse, or rather an adaptation, of Terence's "Eunuch," which gave no indication of his future powers. He soon went to Paris, and was introduced to Fouquet, the great patron of literature and art at that time, who appointed him his poet, and bestowed upon him a yearly income of 1,000 livres. La Fontaine was thus enabled to live at his ease for seven years, during which he produced only occasional poems of no great merit. On the fall of his protector he wrote in 1661 his admirable *Élégie aux nymphes de Vaux*, an eloquent but fruitless appeal to the magnanimity of Louis XIV. in behalf of the superintendent. Two years later he renewed his entreaties in his *Ode au roi*, but with no better success. He would now have been at a loss for means of livelihood, had it not been for the generosity of two noble ladies, the duchess of Bouillon, Cardinal Mazarin's youngest niece, who welcomed him at her château, and the duchess dowager of Orleans, from whom he received a pension as her gentleman servant; but he was always neglected by the king, who could not overlook his irregular mode of life, the character of some of his writings, and above all his fidelity to Fouquet. In 1665 he brought out the first series of his *Contes*; a second part appeared in 1666, and they were completed in 1671.

and 1675. Notwithstanding their licentious turn, they were eagerly read even by the most respectable ladies. Meanwhile he had already published part of the work upon which his fame especially rests; the first six books of his *Fables* had appeared in 1668 with a dedication to the dauphin, the son of Louis XIV. and pupil of Bossuet. The following five books were published in 1678 and 1679, with a dedicatory epistle to Mme. de Montespan; the 12th and last, written under encouragement from the young duke of Burgundy, grandson of the king, through his preceptor Fénelon, was printed 15 years later, when the poet had reached the age of 73. His life had undergone several changes during that period of increasing fame; the death of the duchess of Orleans and the exile of the duchess of Bouillon left him unprovided for, but he received the most generous hospitality from Mme. de la Sablière, a lady celebrated for her literary taste, who for 20 years secured him all the comforts of a home. When she died, he was fortunate enough to find at M. d'Hervart's another home, where he was cared for with equal kindness, and where he died. During the last two years of his life the religious sentiments of his youth revived; he performed severe penances for such of his works as strict morality could not approve of, and it may be said that his end was the sage's death as depicted by himself: *Rien ne trouble sa fin; c'est le soir d'un beau jour*. He had been elected to the French academy in 1683, but was not admitted till 1684 in conjunction with Boileau the satirist. His character presented a strange mixture of childish simplicity and finesse, which is perceptible in his poems. His freedom from all restraint and his dreamy disposition have given birth to innumerable anecdotes of his absence of mind. Besides the works mentioned above, he left *Psyché*, a mythological novel, and *Adonis*, a charming narrative poem, both of which were published in 1669 under the patronage of the duchess of Bouillon; *Phlémon et Baucis* and *Les filles de Minée*, which, although intended as mere imitations of Ovid, are stamped with true originality; four or five light comedies, and two operas. There are several recent editions of La Fontaine's complete works; and his select works, his fables in particular, are constantly reprinted in every form. Many translations into English have been made, including the "Fables" in verse by Robert Thompson (4 vols. 8vo, Paris, 1806), and by Elizur Wright (French and English, illustrated, 2 vols. 8vo, Boston, 1841; 2 vols. in 1, 12mo, 1856). There is an excellent *Histoire de la vie et des ouvrages de La Fontaine*, by Walckenaer (4th ed., Paris, 1858).

**LA FORGE, Anatole de**, a French author, born in Paris, April 1, 1821. He was for several years in the diplomatic service, and from 1848 to 1863 was a prominent editor of *Le Siècle* and a warm advocate of the independence of Italy and Poland. In September, 1870, the government of the national defence appointed

him prefect of the department of Aisne; and although the Germans had invaded the greater part of that department, he successfully defended Saint Quentin (Oct. 8), where he was wounded, and afterward resigned because he was not allowed to resist a new attack against that town. He joined Gambetta at Tours, and for a short time at the beginning of 1871 he was prefect of Basses-Alpes. He has published a great variety of writings, including *Histoire de la république de Venise sous Manin* (2 vols., Paris, 1850), and *Des vicissitudes politiques de l'Italie dans ses rapports avec la France* (2 vols., 1850); and he is now engaged (1874) in finishing his *Histoire du cardinal Richelieu*.

**LA FOURCHE**, a S. E. parish of Louisiana, bordering on Baratavia bay and intersected by Bayou La Fourche; area, 1,100 sq. m.; pop. in 1870, 17,719, of whom 6,659 were colored. The surface is level, and the soil, except where too marshy for cultivation, is very fertile. Morgan's Louisiana and Texas railroad passes through the parish. The chief productions in 1870 were 181,095 bushels of Indian corn, 11,624 of sweet potatoes, 1,691,410 lbs. of rice, 7,128 hogsheads of sugar, and 366,685 gallons of molasses. There were 334 horses, 1,812 mules and asses, 1,241 cattle, and 521 swine; 1 iron foundry, 1 saw mill, and 69 manufactories of molasses and sugar. Capital, Thibodeaux.

**LA FUENTE**, or **Lafuente, Modesto**, a Spanish historian, born in 1806. He was for some time professor at Astorga, and became known at Leon and subsequently in Madrid as a satirical journalist. His periodical writings, chiefly published under the name of Fray Gerundio (1844-'50), acquired great popularity; his principal work is a *Historia general de España* (26 vols., Madrid, 1850-'62).

**LA FUENTE Y ALCÁNTARA, Mignel**, a Spanish historian, born in the province of Malaga, July 10, 1817, died in Havana in August, 1850. He studied law, devoted himself to historical investigations, became secretary of the cortes, and was appointed attorney general (*fiscal*) in the island of Cuba. He had barely arrived in Havana when he was attacked by the local fever and died. His vast researches into the history of his country, and his appreciation of its different political phases as well as its romance, are exhibited in his *Historia de Granada* (4 vols., Granada, 1848-'8; 2 vols., Paris, 1851). He also wrote a work on hunting, and one on the characters and revolutions of the different races in Spain at different periods, and especially of the Moors during the middle ages.

**LAGO MAGGIORE** (anc. *Lacus Verbanus*), a lake of N. Italy and Switzerland, enclosed by Lombardy, Piedmont, and the canton of Ticino; length 40 m.; average breadth 2 m., greatest breadth 5 m.; greatest depth 2,625 ft.; elevation of surface above the sea, about 683 ft. The principal affluents are the Ticino, flowing from the St. Gothard range, the Toce or Toccia, entering on the west, and the Tresa,

which drains the lake of Lugano; its great outlet is the Ticino, which issues from its S. extremity at the town of Sesto. Near the entrance of the gulf of Tosa, on the W. side, lie the Borromean islands, remarkable for their picturesque beauty. The Swiss portion of this lake is termed lake of Locarno. The surrounding mountains are covered with forests, the timber of which gives rise to a considerable traffic, and employs numerous vessels. Steamers ply regularly between Magadino, near the N. extremity, and Sesto. The lake abounds in fish, particularly trout. There are valuable quarries of fine white marble on its shores.

**LAGOMYS.** See PIKA.

**LAGOS**, a seaport town of Portugal, in the province of Algarve, 110 m. S. S. E. of Lisbon, on the N. W. shore of Lagos bay; pop. about 8,000. It is well built, and contains three churches, three convents, a civil and military hospital, an almshouse, a grammar school, and a handsome aqueduct. Its inhabitants are chiefly engaged in the tunny and sardine fishery. The harbor, which is only navigable for small vessels, is defended by four forts. In the bay of Lagos, Aug. 17, 1759, a British fleet under Boscawen obtained a decisive victory over a French squadron under De la Clue.

**LAGOS**, a British settlement on the coast of Dahomey, W. Africa, comprising the island of Lagos, called Eko by the natives, and the coast from the river Yerewa, near Badagry, to Ode, about lon. 4° 10' E.; pop. in 1871, 60,221, of whom only 92 were whites. Within these bounds are the fortified trading posts of Badagry, Lagos, Palma, and Leckie, and a few native villages. The station at Ode is now abandoned. A strip of country back of these forts, from 5 to 12 m. wide, is considered to be under the protection of Great Britain. The coast is low and sandy, with outlying bars and lagoons inland. The island of Lagos is at the mouth of Ikorodu lagoon, which opens into the sea through a narrow channel. Large vessels do not pass in, but land their cargoes on the outer beach, whence they are carried by canoes to the inner lagoon. A narrow arm of this lagoon stretches westward parallel to the coast about 60 m. to Denham lagoon. Badagry is on the inner side of this strait. Palma and Leckie are on the outer coast, 70 or 80 m. further E. The chief rivers which empty into the lagoon are the Yerewa, the Ogun or Lagos, and the Ona. The trade at these settlements was once flourishing, and previous to the troubles on the Gold coast the revenue amounted to £45,000. The principal exports are palm oil and kernels, shea butter, ground nuts, cotton, and indigo. In 1872 the value of the imports was £366,256; exports, £444,848. The revenue for the same year was £41,346; expenditure, £41,346; public debt, £18,628.—The town of Lagos had in 1871 a population of 36,005, of whom 82 were white. The church (of England) missionary society, the Wesleyan society, and the Roman Catholics

have churches and schools there. The hospital, built originally as a barrack for troops, is the principal public building. Lagos was formerly the capital of a small territory tributary to Dahomey. It was one of the chief slave-trading stations on the coast, and was strongly fortified. In November, 1851, a British consul was fired on while negotiating a treaty for the abolition of the slave trade, and a small force from the steamer Bloodhound, which attempted to avenge the insult, was driven off. In December following an organized attack was made, and it was captured, although defended by 5,000 men and more than 50 guns. It was formally ceded to Great Britain in 1861.

**LAGOSTOMUS**, a genus of mammals of the chinchilla family, inhabiting the vast plains east of the Andes. There is but one species, *L. trichodactylus*, the viscacha or biscacho. The anterior feet are four-toed, with small falcular nails for digging; the posterior three-toed, with strong



Lagostomus (*L. trichodactylus*).

straight nails; ears and tail moderate. They dwell in burrows, which are near the surface, and so numerous that in many places it is dangerous to ride rapidly over the plains or pampas inhabited by them. Like the prairie dog of North America, this animal has companion burrowing owls, which sit at the mouth of the holes during the daytime; as in the case of the American rodent, it is not likely that the owl lives in the same hole, but it makes use of these burrows which it finds ready dug, driving out the viscacha, and perhaps occasionally making a meal on the unprotected young; from the absence of shrubs and trees on the great prairies and pampas, the owls, unable to burrow themselves, occupy the holes of the rodents as habitations and breeding places.

**LAGOTIS** (Bennett), or *Lagidium*, a genus of the chinchilla family, having the following dental formula: incisors  $\frac{3}{3}$ ; molars  $\frac{4-4}{4-4}$  = 20. The incisors are sharpened, and each molar con-

sists of three complete oblique plates. Skull arched posteriorly and above; the superior cellules of the tympanum are inconspicuous. All the feet are four-toed, the great toe being entirely absent; nails long and subfalcular; ears very long; tail long; fur soft but caducous. Of this genus there are two species, the *L. Cuvieri* and the *L. pallipes*, being, it is supposed, the viscacha of all the writers from Pedro de Cieça downward, who have declared that animal to be an inhabitant of the western or Peruvian slope of the Andes. It is about the size and color of the hare, which is wanting to the fauna of Peru, Chili, and Ecuador, and appears to be equivalent in those countries to that creature and to the rabbit, among which it has been classed by some writers, especially Lesson, in his *Manuel*, who has apparently confounded the eastern and western species, *lagotis* and *lagostomus*, and who gives it as the *lepus viscaccia* of Gmelin. This



Lagotis Cuvieri.

animal breeds among rocks and stony places, burrows in the ground, and is famous, if mortally wounded and not killed at once, for taking refuge in its burrow and dying within it, so as to be lost to its pursuers. Its fur, which is longer and softer than that of the rabbit, has the peculiarity of falling out as soon as the animal is dead. This animal and the chinchilla are evidently connecting links between the hares and the squirrels, the first coming nearer to the hares, the latter to the squirrels.

**LA GRANGE**, a N. E. county of Indiana, bordering on Michigan, and drained by Pigeon river; area, 384 sq. m.; pop. in 1870, 14,148. It has a nearly level surface, much of which is occupied by timber. The soil is fertile. The Grand Rapids and Indiana railroad passes through the county. The chief productions in 1870 were 445,731 bushels of wheat, 344,882 of Indian corn, 58,488 of oats, 119,563 of potatoes, 120,461 lbs. of wool, 243,649 of butter,

and 18,139 tons of hay. There were 5,217 horses, 4,211 milch cows, 5,072 other cattle, 31,958 sheep, and 12,004 swine; 4 manufactories of carriages, 1 of woollen goods, 6 flour mills, 17 saw mills, and 3 currying establishments. Capital, La Grange.

**LAGRANGE, Joseph Louis**, count de, a French geometrician, born in Turin, of French parents, Jan. 25, 1736, died in Paris, April 10, 1813. His first publication was a letter to C. J. Fagnano, June 23, 1754, which contained a series of fluxions and fluents of different orders, somewhat resembling the binomial theorem of Newton. In 1755 he was made professor of geometry in the royal school of artillery at Turin, where many of his pupils were his seniors. In conjunction with several of them, he established a scientific society, whose memoirs, owing particularly to his contributions, afterward acquired a high reputation, his essays on the propagation of sound being especially noticed. He meanwhile corresponded with Euler, to whom he communicated his first ideas of the solution of the isoperimetrical problems. In 1764 he won a prize from the French academy of sciences for a memoir on the libration of the moon. In 1766 a second prize, on the subject of the satellites of Jupiter, was awarded him by the French academy; and he was invited to become a mathematical director of the Prussian academy. In Berlin he was treated with great distinction by Frederick the Great, and spent there 20 years, during which he prepared his great work, the *Mécanique analytique*. On the death of Frederick, yielding to a secret desire and to the entreaties of Mirabeau, notwithstanding liberal offers from the courts of Naples, Sardinia, and Tuscany, he went to France, where he was welcomed by Queen Marie Antoinette, received as a veteran pensioner of the academy an income equal to that which he had enjoyed at Berlin, and was provided with apartments in the Louvre. His *Mécanique analytique* appeared a few months after his arrival in Paris in 1787, and commanded general admiration. Though now in the zenith of his fame, he was seized with fits of morbid melancholy, during which he lost all taste for his wonted pursuits. His spirits revived about the beginning of the revolution, and his treatment by the revolutionists was perhaps still more flattering than that which he had obtained from kings and princes. His pension was unanimously confirmed by the national assembly, and he was appointed member of a committee for examining useful inventions, and director of the mint in conjunction with Monge and Berthollet. In 1793, when a decree of the convention ordered all persons not born in France to leave the country, an exception was made in favor of Lagrange. On the establishment of the normal school and of the polytechnic school he was appointed professor in those institutions. For his pupils he wrote his *Théorie des fonctions analytiques* (4to, 1797; new ed., 1813), and his *Leçons sur*



*le calcul des fonctions* (last ed., 1806); but the ideas in these books are far from being as perfect as the method of fluxions and its kindred doctrines. On the foundation of the institute and the board of longitude, he was placed among the members of the former, and at the head of the latter. On the entrance of the French army into Turin, the generals and many high functionaries, headed by the civil commissary, went in procession, by order of the directory, to congratulate Lagrange's father, then 90 years of age, on the merits of his son. Napoleon made him a senator and a count of the empire, and styled him the "high pyramid of mathematical sciences." His last years were devoted to preparing new editions of his *Mécanique analytique* (2 vols. 4to, 1811-'15), and *Théorie des fonctions analytiques* (4to, 1813). An edition of his complete works was published in 1867-'70, at the cost of the government.

**LA GRANJA**, or **San Ildefonso**, a small town of Spain, in the province of Segovia, 34 m. N. N. W. of Madrid, renowned for its romantic situation on the N. declivity of the Sierra Guadarrama, and for a fine palace built by Philip V. (1724-'7) at an elevation of nearly 4,000 ft., with pleasure grounds, in imitation of Versailles. One of the fountains (*f fuente de la fama*) rises 150 ft. The royal family resided here in summer, and here Maria Christina was surprised in the night of Aug. 13, 1836, by a number of *exaltados*, who had bribed her guards, and who obliged her to agree to restore the constitution of 1812, whence the name of "revolution of La Granja." Philip V. and his queen are buried in the church of the town. A manufactory after the model of Sèvres has been established here, but with little success. In the vicinity are various villas and parks which belong to the royal family.

**LA GUAYRA**, or **Laguaira**, a seaport of Venezuela, on the Caribbean sea, 5 m. N. E. of Carácas, of which it is the port; lat. 10° 36' N., lon. 66° 57' W.; pop. about 6,000. It comprises only two streets running E. and W., and occupies a narrow strip of land between the mountains and the sea; the houses are well built, and there are one or two good public edifices. The port is a deep bay with several creeks, the principal of which is that of Macuto to the east. The bottom is regular, and there is 15 ft. of water at a cable's length from the shore; but there being no shelter against the prevailing easterly winds, the anchorage is unsafe, and landing is often attended with great danger. Although La Guayra is the most extensively frequented port on the coast, ships after discharging their cargo commonly go to Puerto Cabello in search of safer anchorage and for repairs. The fort of Cerro Colorado commands the town; and the coast is lined at intervals with numerous batteries, most of which are, however, without armament. The principal commercial houses are branches of establishments in Carácas. The shipping averages about 200 vessels annually,

with an aggregate of 40,000 tons. The chief articles of export are coffee, cacao, indigo, hides, and sarsaparilla; the imports include machinery, manufactured goods, flour, and wine; and the total annual value of both exports and imports is estimated at \$8,000,000. There is besides an extensive coasting trade in the various productions of the country for Carácas, with which communication is carried on by a carriage road 12 m. long. The climate is healthy, although the heat, the greatest on the Caribbean shores, except that of Maracaibo, is excessive, ranging from 100° to 110° F.

**LA HARPE**, **Frédéric César**, a Swiss statesman, born at Rolle in 1754, died in Lausanne, March 30, 1838. He was educated in democratic opinions, and began the practice of law, but, disliking the profession, was on the eve of going to the United States to enlist in the continental army, when he became preceptor of a young Russian nobleman, whom he accompanied to Italy. His success attracted the attention of the empress Catharine II., who called him to St. Petersburg, confided to his care her two grandsons, Alexander and Constantine, and gave him the grade of colonel. The republican preceptor subjected the young princes to severe training, and taught them principles and ideas which seldom find their way into courts. On the breaking out of the French revolution, he actively participated by his writings in the plans for reorganizing the Helvetic confederation so as to make it a single and undivided republic. The government at Bern having made this known to the empress, she dismissed him, with a pension for life. Leaving Russia in 1793, he went to Geneva, and then to Paris, where he secured the intervention of the directory, thus accomplishing the revolution of 1798 by which Switzerland was to become a democratic republic. He became the controlling member of the Helvetic executive directory, and wielded with energy, and even violence, the power he had acquired through foreign arms; but his hopes were dispelled by the change in French policy after the 18th Brumaire. The Helvetic directory was dissolved, and La Harpe, suspected of conspiring against the new order of things, was arrested; but he escaped to Paris, and was told by Bonaparte that he had better leave Switzerland alone. He then retired to Plessis-Piquet, near Paris, where he devoted himself to agricultural pursuits, until the fall of the empire revived his hopes of his country's emancipation. In 1814 he received a visit from the emperor Alexander, who gave him the rank of general in the Russian army and bestowed upon him many distinguished favors. La Harpe resumed his influence over the mind of his former pupil; and if he could not prevail upon him to favor his democratic plans in regard to Switzerland, he at least contributed to the preservation of that confederation, and to the liberation of his own canton of Vaud from the rule of Bern. After the treaty of Vienna he resided in Lausanne. He published a num-

ber of pamphlets expounding his plans for the reorganization of his country, and denouncing the misdeeds of its old governments.

**LA HARPE, Jean François de**, a French critic, born in Paris, Nov. 20, 1739, died there, Feb. 11, 1803. His father died when he was nine years old, and he was admitted as a free scholar to the Harcourt college, where he gave early evidence of literary talent. On leaving this institution, he wrote with several of his comrades some satirical verses on certain members of the college, for which he was imprisoned by the police for several months. This severe punishment, together with his narrow circumstances, increased the natural bitterness of his disposition. His first attempts at poetry were heroic epistles, a kind of poem then much in vogue. In 1768 he produced his tragedy of *Warwick*, which was successful. Three similar plays, *Timoléon* (1764), *Pharamond* (1765), and *Gustave Wasa* (1766), failed; and, disappointed in his anticipations of fortune, he went to Ferney, where he remained for nearly two years the guest of Voltaire. On his return to Paris in 1768, he became a contributor to the *Mercure de France*, and was noted for the bitterness of his criticism. He won 11 of the academical prizes within 10 years, 8 being at the French academy. These successes, as well as the reputation which he won by his *Mélanie, ou la Religieuse*, a play flattering the liberal ideas of the time, procured in 1776 his election to the academy. The tragedies he produced after this were mercilessly criticised, and, with the exception of *Philoctète* (1780) and *Coriolan* (1784), were coldly received by the public. He was meanwhile the correspondent of the grand duke Paul of Russia, the son of Catharine II., and undertook several publications, especially an *Abrégé de l'histoire générale des voyages*, from which he realized some profit. He adopted the revolutionary principles, showed himself an ardent Jacobin, and became an occasional flatterer of Robespierre. Yet he was incarcerated during the reign of terror, which made such an impression on his mind that he became a devout Christian and an uncompromising enemy of all that was called philosophy. On his liberation after the 9th Thermidor, he resumed with great success a course of public lectures which he had begun a few years before. These lectures, collected under the title of *Lycée, ou Cours de littérature ancienne et moderne* (12 vols. 8vo, 1799-1805), were long regarded as a standard of literary criticism. His *Correspondance littéraire* with the grand duke Paul was printed in 1801 (4 vols. 8vo); and the severity of its judgments rekindled the hatred against him, and embittered the last years of his life.

**LA HOGUE.** See CAPE LA HAGUE.

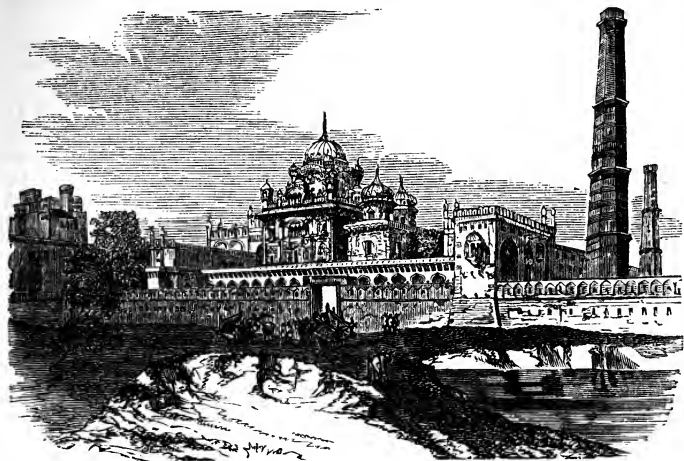
**LA HONTAN, Armand Louis de Delondarce de**, baron de la Hontan et Herlèche, a French traveller, born near Mont de Marsan, Gascony, about 1667, died in Hanover in 1715. His travels, which were widely read in French and

translated into English and other languages, make him play an important part in Canadian affairs, but he evidently came out merely as a private soldier. The voluminous Canadian documents are utterly silent as to him and his services. He came over in 1683 in one of the three companies of marines sent to enable Gov. de la Barre to invade the Iroquois cantons. He was in that governor's fruitless expedition, and in Denonville's against the Senecas. In 1688 he was sent to Michilimackinac and Sault Ste. Marie with a detachment, and pretended to have discovered and explored Long river, a branch of the Mississippi, which he peopled with fictitious tribes, misleading geographers for many years. He soon after descended to Quebec, and in November, 1690, sailed for France. He was sent back to Canada in 1691, and while he was returning to France soon after with despatches from Frontenac, the vessel put in to Placentia, Newfoundland, and La Hontan rendered signal service in defending it against the English. He was accordingly made king's lieutenant in Newfoundland and Acadia, with a company of 100 men. On arriving there in 1693 he got into difficulties with Gov. de Brouillon, and made his escape to Portugal. He then visited Spain, Denmark, and England. After vainly soliciting redress and advancement from the French court, he published his *Nouveaux voyages de M. le baron de Lahontan dans l'Amérique Septentrionale* (2 vols. 12mo, the Hague, 1703; the second volume relating chiefly to the Indians). A third volume, *Dialogue de M. le baron de Lahontan et d'un sauvage dans l'Amérique, avec les voyages du même en Portugal*, appeared at Amsterdam in 1704. The dialogue is fictitious and merely a vehicle for anti-Christian ideas. The voyages are dedicated to the king of Denmark, and are said to have been rewritten by Gueudeville. La Hontan also wrote *Réponse à la lettre d'un particulier opposée au manifeste de S. M. le roi de la Grande Bretagne contre la Suède*, published by Leibnitz after the baron's death. Truth and fiction are so blended in his work that it has long ceased to be of any authority.

**LAHORE**, a city of India, capital of the Punjab, about 1 m. from the E. bank of the Ravee, in lat. 31° 36' N., lon. 74° 21' E., 265 m. N. W. of Delhi; pop. in 1871, 98,924. It is walled with brick and defended by a citadel and outworks. The moat which formerly encircled it is now filled up, and is laid out in gardens and planted with trees. There are several fine mosques, including one of red sandstone, with lofty minarets and cupolas, said to have been built by Aurungzebe. The Hindoos have a number of temples, and in the neighborhood are some handsome tombs, one of the most attractive of which is that of the emperor Jehanghir, built of red sandstone and adorned with marble mosaics representing flowers and texts of the Koran. The city has narrow streets, tall gloomy houses, small but well furnished bazaars, and a vernacular college sup-

ported partly by the British government, having several hundred pupils. Lahore has little commercial activity, but has some manufactures, chiefly lacquered wares, mirrors, and silks, especially shawls, flowered with gold and silver threads. The surrounding country is

government to stop the slave trade, opened negotiations with the king of the Foolaahs at Timbo, the capital of Foota Jallon, and contributed much to the knowledge of that country and of the upper course of the Niger. The war with the Ashantees, in which Governor McCarthy



Tomb of Runjeet Singh, Lahore.

covered with vast ruins, attesting the magnificence of the ancient city, which was the capital of the Ghuznevite dynasty in the 12th century, and the favorite residence of the descendants of Baber. It is said to have been founded by Lava or Lo, the son of Rama, whose wife Leeta is still worshipped here. Runjeet Singh was invested with the rajahship of Lahore by Zeman Shah in 1799, and after his death the territory was seized by the British (1849) and consolidated with the rest of the Punjab.

**LAHR**, a town of Germany, in Baden, on the Schutter, 24 m. N. of Freiburg; pop. in 1871, 7,710. It has a gymnasium, a Protestant and a Catholic church, a female high school, an industrial and a commercial school, and manufactories of tobacco, leather, vinegar, and snuff-boxes. A branch line connects the town with the Baden railway. Since 1800 the most popular almanac of Germany, *Der Lahrer Hunkende Bote*, has been published here; it reached in 1873 a circulation of over 800,000, more than 50,000 being among the Germans of America.

**LAIBACH**. See LAYBACH.

**LAINZ**. See LAYNEZ.

**LAING, Alexander Gordon**, a British traveller, born in Edinburgh, Dec. 27, 1794, murdered near Timbuctoo, Africa, in September, 1826. He was educated for a schoolmaster, but joined the army, went to the West Indies in 1811, and served there several years in various positions, a part of the time with his uncle, afterward Lieut. Gen. Gordon. In 1820 he went to Sierra Leone, and became aide-de-camp to the governor, Sir Charles McCarthy. He took an active part in the efforts made by the English

lost his life, compelled him to return to Sierra Leone. On returning to England he was made major, and placed at the head of an African exploring expedition. He sailed for Tripoli in 1825, and on July 26, 1826, joined a caravan for Timbuctoo, which he reached on Aug. 18. He left there on Sept. 22 for Sego, where he expected to arrive in 15 days, but was killed on the journey by the Arabs of the country, acting under instructions, it was afterward discovered, of the son of the prime minister of the bashaw of Tripoli. He published an account of his first journey under the title of "Travels through the Timanee, Kooranko, and Soolima Countries, to the Sources of the Rokelle and Niger, in the year 1822" (8vo, London, 1825).

**LAING, Malcolm**, a Scottish historian, born on the island of Mainland, Orkneys, in 1762, died there in November, 1818. He was educated at the university of Edinburgh, studied law, and was called to the bar in 1785; but not succeeding in his profession, he turned his attention to literature. His first work was a continuation of Dr. Henry's "History of Great Britain," which was followed in 1800 by a "History of Scotland, from the Union of the Crowns to the Union of the Kingdoms." To this were appended two dissertations, historical and critical, one on the Gowry conspiracy, the other on the authenticity of Ossian's poems. His arguments against the latter brought considerable obloquy upon him at the time, but led to the investigation and report of the Highland society. To the second edition of his history (1804) he appended an essay "On the Participation of Mary, Queen of Scots, in the Murder of Darnley," in which he strongly argued her guilt. In 1807 he was a member of parliament for the Orkneys, but ill health soon compelled him to withdraw to private life. Besides the works already mentioned, he published an edition of the "History and Life of King James VI.," from the original manuscript, which had served as the foundation of the forgeries of Crawford in his "Memoirs of the Affairs of Scotland."—His brother, SAMUEL LAING, is known as the author of books of travel, and of works on so-

count of his first journey under the title of "Travels through the Timanee, Kooranko, and Soolima Countries, to the Sources of the Rokelle and Niger, in the year 1822" (8vo, London, 1825).

cial and political subjects. A new edition of his book on Norway appeared in 1854.

**LAIRESSE, Gérard de**, a Flemish painter, born in Liège in 1640, died in Amsterdam, July 28, 1711. At the age of 16 he was a successful painter, and received large prices for his pictures; but dissipation kept him in poverty until he removed to Amsterdam, where he rose to fortune and reputation. At the age of 50 he became blind, but he dictated his discourses on the theory and practice of painting, which were published under the title of *Groot schilderboek* (Amsterdam, 1707). He excelled in subjects drawn from mythology, particularly bacchanalian scenes.

**LAIÏS**, the name of two celebrated courtesans of ancient Greece. **I.** The elder Laïs lived in the time of the Peloponnesian war, and is generally supposed to have been a native of Corinth. She was considered the most beautiful woman of her age, but was also remarkable for her avarice and caprice. Among her lovers was the philosopher Aristippus, who dedicated two of his works to her. She grew enamored of Eubotas of Cyrene, who promised to take her to his native city if he should prove victor in the Olympic games. He succeeded, and fulfilled his promise by taking thither her portrait. In her old age she became intemperate, and died at Corinth, where a monument was erected to her memory in the grove called the Cranion. **II.** The younger Laïs was a native of Hyccara in Sicily, and lived in the age of Philip and Alexander the Great. She removed to Athens in her youth, and is said to have been induced by the painter Apelles to adopt the profession of a courtesan. She became the rival of the famous Athenian hetæra Phryne; but falling in love with a handsome Thessalian youth named Hippolocus, she accompanied him to his native country, where her beauty exciting the jealousy and envy of some of her sex, they allured her into a temple of Venus, and there stoned her to death. She was buried on the banks of the Peneus; the inscription engraven on her monument is given by Athenæus.

**LAKE** (It. *lacca*), a pigment prepared from infusions of vegetable dyes or of cochineal, by causing the coloring matter to unite and form a precipitate with some earthy or metallic oxide. This is usually alumina, but the oxides of tin and zinc sometimes serve as the basis. A solution of alum is employed to furnish the alumina, and potash is commonly added to it—always if the infusions are acid. If the infusions are made with alkaline liquors, the alum solution may be added alone. A decoction of turmeric yields an orange lake; of cochineal, a brilliant red lake (see **CARMINE**); of Brazil wood, also a red, made violet by excess of potash, and brownish by cream of tartar. Madder also gives a red lake. Persian or French berries produce yellow lakes; and green lakes may be obtained from these mixed with blue pigments. The varieties of blue pigments in use render it needless to prepare blue lakes.

**LAKE**, the name of nine counties in the United States. **I.** The N. W. county of Tennessee, bounded N. by Kentucky, W. by the Mississippi river, which separates it from Missouri, and S. E. by Redfoot river; area, about 250 sq. m.; pop. in 1870, 2,428, of whom 393 were colored. The surface is level, and the soil fertile. The chief productions in 1870 were 414,570 bushels of Indian corn and 52 bales of cotton. There were 511 horses, 615 milch cows, 1,304 other cattle, 816 sheep, and 5,853 swine. Capital, Tiptonville. **II.** A N. E. county of Ohio, bordering on Lake Erie and drained by Grand and Chagrin rivers; area, 220 sq. m.; pop. in 1870, 15,935. The surface is undulating, and the soil a fertile clayey loam, with occasional ridges of sand. Iron ore is found. The Lake Shore and the Painesville and Youngstown railroads pass through it. The chief productions in 1870 were 84,164 bushels of wheat, 236,771 of rye, 202,948 of oats, 700,910 of potatoes, 99,058 lbs. of wool, 20,650 of hops, 409,550 of butter, and 22,009 tons of hay. There were 3,598 horses, 5,409 milch cows, 4,267 other cattle, 22,906 sheep, and 2,936 swine; 15 manufactories of carriages, 1 of drugs and chemicals, 1 of explosives and fireworks, 4 of iron castings, 3 of machinery, 3 of sash, doors, and blinds, 7 of tin, copper, and sheet-iron ware, 3 of tobacco and cigars, 2 of woollen goods, 3 planing mills, 13 saw mills, and 7 flour mills. Capital, Painesville. **III.** A N. W. county of Indiana, bordering on Lake Michigan and Illinois, bounded S. by the Kankakee river and drained by the Calumick and Deep; area, 468 sq. m.; pop. in 1870, 12,339. The surface is level and diversified by woodlands and prairies, with large marshes near the Kankakee; the soil is generally fertile. It is traversed by several railroads. The chief productions in 1870 were 63,398 bushels of wheat, 189,947 of Indian corn, 364,008 of oats, 73,516 of potatoes, 49,989 lbs. of wool, 557,820 of butter, 40,650 of cheese, and 40,994 tons of hay. There were 5,560 horses, 7,694 milch cows, 9,489 other cattle, 11,637 sheep, and 8,526 swine; 4 manufactories of carriages, 4 of brick, 1 of sash, doors, and blinds, 1 brewery, and 5 flour mills. Capital, Crown Point. **IV.** A N. E. county of Illinois, bordering on Lake Michigan and Wisconsin, and drained by Fox and Des Plaines rivers; area, 425 sq. m.; pop. in 1870, 21,014. The surface is chiefly an undulating prairie, diversified by tracts of timber and many small lakes. The soil is a rich, deep, black loam. The Chicago and Northwestern railroad passes through it. The chief productions in 1870 were 169,135 bushels of wheat, 517,353 of Indian corn, 699,069 of oats, 222,234 of potatoes, 318,042 lbs. of wool, 927,533 of butter, 128,207 of cheese, and 76,337 tons of hay. There were 8,087 horses, 12,167 milch cows, 10,787 other cattle, 67,763 sheep, and 13,385 swine; 8 manufactories of carriages, 2 of brick, 3 of cheese, 1 of pumps, 1 brewery, 1 planing mill, 3 tanneries, 3 curry-

ing establishments, 1 flour mill, and 1 saw mill. Capital, Waukegan. **V.** A W. county of the lower peninsula of Michigan, drained by the Notipeskago river and affluents of the Manistee; area, 576 sq. m.; pop. in 1870, 548. Capital, Chase. **VI.** A N. E. county of Minnesota, bordering on British America and Lake Superior; area, 4,500 sq. m.; pop. in 1870, 135. A chain of lakes extends along the N. border, and the S. E. portion is watered by numerous streams that empty into Lake Superior. The surface is broken by rugged ranges of drift hills. Copper and iron are found. Capital, Beaver Bay. **VII.** A N. W. county of California, bounded E. by the Coast range; area, 972 sq. m.; pop. in 1870, 2,969, of whom 119 were Chinese. It contains Clear lake, which receives numerous streams, and empties through Cache creek into the Sacramento. The valleys of the lake and streams are productive, and the hills afford pasturage. Borax lake, covering 300 acres, near Clear lake, yields that commodity abundantly. In the S. E. part are valuable quicksilver mines. Sulphur is found on the E. side of Clear lake, and copper and other minerals in various localities. The chief productions in 1870 were 87,016 bushels of wheat, 11,615 of Indian corn, 3,894 of oats, 67,946 of barley, 5,154 of potatoes, 58,046 lbs. of wool, 84,268 of butter, 63,340 of cheese, and 5,296 tons of hay. There were 1,984 horses, 1,827 milch cows, 2,408 other cattle, 16,307 sheep, and 11,547 swine; 4 saw mills, and 1 establishment for smelting quicksilver. Capital, Lakeport. **VIII.** A W. county of Colorado, bounded E. by the Rocky mountains, and W. by Utah; area, about 12,500 sq. m.; pop. in 1870, 522. It is watered by the Gunnison and other tributaries of Grand river. The Arkansas rises in this county, and flows S. E. near the E. border. Along this river and near the head waters of the Gunnison gold mining is carried on to some extent. The surface is broken by a continuous series of spurs and ranges, extending from the Rocky mountains to the N. and W. borders, but there are numerous fertile valleys and small parks, and much of the county is adapted to grazing. Timber is abundant. In 1870 there were 13 placer and 2 quartz gold mines. The chief productions were 2,173 bushels of wheat, 5,338 of oats, 6,530 of potatoes, and 111 tons of hay. The value of live stock was \$47,673. There were 1 flour mill and 3 saw mills. In 1874 the S. portion was set off to form Hinsdale and La Platte cos. Capital, Dayton. **IX.** A S. E. county of Dakota territory, recently formed and not included in the census of 1870; area, 720 sq. m. It is drained by affluents of Vermilion river and of the Big Sioux.

**LAKE, Gerard**, viscount, an English general, born July 27, 1744, died Feb. 20, 1808. He successively served in the seven years' and the American war, and under the duke of York in Holland, became general, and was commander-in-chief during the Irish rebellion of 1797-8.

In 1800 he went to India in the same capacity, and achieved victory after victory during the Mahratta war (1803), storming Alighur, occupying Delhi and making the old and blind Mogul emperor Shah Allum the vassal of England, capturing Agra, and winning a decisive battle near Laswaree (Nov. 1), which brought the districts N. of the Chumbul into British possession, and for which he was made a baron (Sept. 1, 1804). Subsequently he was engaged in warfare against Holkar (1804-'5), and after his return to England he was made a viscount, Oct. 31, 1807. The third viscount, Warwick Lake, dying June 24, 1848, without male issue, the title became extinct.

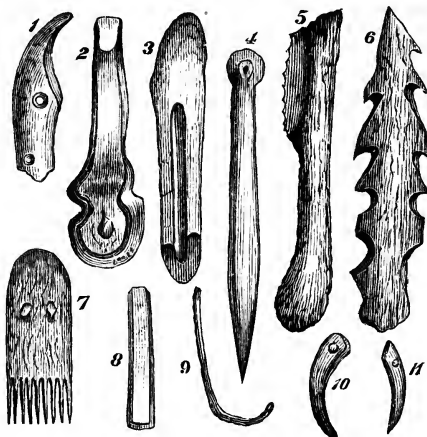
**LAKE, Henry Atwell**, an English soldier, born about 1809. He is a younger son of Sir James Samuel William Lake, and rose in the engineer service in India (1826-'55) to the rank of lieutenant colonel. In the Crimean war he rendered Kars almost impregnable, and was called by the Russians the English Todleben, and was not held responsible for the surrender of that stronghold (1855). With Gen. Williams he was a prisoner of war in Russia till the restoration of peace, and after his return to England he published "Kars and our Captivity in Russia" (London, 1857). Subsequently he was made colonel, aide-de-camp to the queen, and chief commissioner of the Dublin police.

**LAKE DWELLINGS**, a class of prehistoric habitations existing in some form in various parts of the world, but found in greatest perfection and most thoroughly explored in Switzerland. In Scotland and Ireland they are called crannoges. They are of two kinds, fascine dwellings and pile dwellings. The former were built on a foundation of reeds or tree stems, woven together in horizontal layers alternated with layers of clay or gravel, the whole mass sunk in the water and kept in place by a few stakes or piles. The pile dwellings were built on platforms supported by piles driven deeply into the lake bottom, but projecting above the water. Though the fascine dwellings were the simpler, they were not necessarily the more ancient; the explorations in Switzerland show that they were commonly used in the smaller lakes, and where the bottom was too soft to hold a mass of piles firmly, while the pile dwellings were invariably constructed in the large lakes, where the waves would have swept away a foundation of fascines. Lake dwellings date back to the stone age, and are still in use in some parts of Russia, in Borneo and other islands of the Malay archipelago, and in central Africa. Herodotus relates (book v., 16) that certain tribes of Pæonians lived in pile dwellings on Lake Prasias in Thrace, and as these were connected with the shore by a single narrow bridge, they defied the troops of Darius when their kindred tribes were led away into Asia. Each family had its own hut, with a trap-door beneath, through which they fished by letting down a basket. The infant children were tied by the foot with a cord, to



prevent their falling into the water. Hippocrates records that the colonists of the Phasis lived in reed huts in the middle of the river. Certain Assyrian bass reliefs represent inhabited artificial islands formed of woven rushes. Venezuela received its name (little Venice) from the Spanish discoverers because of the houses built on piles in the lagoon of Maracaibo. The lake dwellings of extinct peoples represent all stages of civilization from the age of stone to the dawn of the iron age. Those of Lake Moosseedorf, Switzerland, are supposed to be the oldest, and those of Ireland the most recent.—In 1829 an excavation on the shore of Lake Zürich at Obermeilen revealed the existence of ancient piles and other antiquities, but no extended examination was made. The winter of 1853-4 in Switzerland was one of extraordinary drought and cold; the rivers shrank to their smallest dimensions, and the level of the lakes was lower than had ever before been known. The inhabitants on the shore of a little bay between Obermeilen and Dallikon took advantage of the low water to extend their gardens by building a wall and filling the space back of it with mud dredged from in front. The dredging brought to light the heads of a system of piles, great quantities of stags' horns, and several ancient implements. Dr. Ferdinand Keller followed up this discovery, and similar remains of prehistoric villages were found in Lakes Zürich, Constance, Geneva, Bienne, Neuchâtel, Morat, and several of the smaller lakes of Switzerland. From 20 to 50 settlements have been explored in each of the larger lakes; and immense numbers of implements of horn, bone, stone, bronze, and pottery have been found, with a few of gold, wood, and iron, mingled with bones of animals, and in a very few cases human remains. The most perfect example of a lake dwelling of the stone age was in the little lake of Moosseedorf, near Bern. The water was artificially lowered 8 ft. in the winter of 1855-6, which revealed a settlement at each extremity of the lake; the one at the eastern end was most thoroughly examined. The piles had been driven irregularly, the mass forming a parallelogram 55 by 70 ft. They were stems of oak, birch, fir, and aspen, from 5 to 7 in. in diameter, some being split and some still retaining the bark. The remains of a bridge which had connected the settlement with the shore were found. The superstructure had apparently been destroyed by fire, only portions of the charred wood remaining. The implements were found, not in the mud of the ancient lake bottom, but in a stratum next above it, now called the relic bed, consisting of loose peat, gravel, clay, wood, and charcoal, from 5 in. to 2 ft. thick. Many of the heaviest implements were near the top of the bed, and many of the lightest near the bottom. Among them were a harpoon of stag's horn, a flint saw fastened with asphalt in a handle of fir wood, needles made of boars' teeth, awls, knives, pincers, chisels, and arrow

heads of bone, fish hooks of boar's tusk, and a comb of yew wood. There were also numerous bones of animals, some of which bore the marks of stone axes and saws; a few fragments of pottery, some incrustated with soot; linseed, and burnt wheat and barley. Every

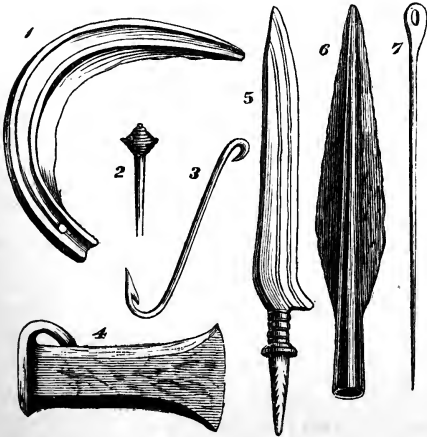


Bone, Flint, and Wooden Implements from Moosseedorf.—  
1. Knife of boar's tooth. 2. Bone chisel. 3. Bone knife. 4. Bone awl. 5. Flint saw, in handle of fir wood. 6. Harpoon of stag's horn. 7. Comb of yew wood. 8. Wedge of fir wood. 9. Fish hook of boar's tusk. 10, 11. Needles of boar's tusk.

hillock in the marsh land around this settlement is full of chips and flakes and unfinished instruments of flint. The lake dwellings situated in what are now peat moors offer in some respects a better opportunity for investigation than those which are still under water. The best specimen of this kind was discovered in 1858 at Robenhäusen near Lake Pfäffikon, in the canton of Zürich. The space covered with piles is an irregular quadrangle containing nearly three acres, which must have been about 2,000 paces from the ancient western shore of the lake in which it stood, and about 3,000 from the eastern; the piles of a bridge connecting it with the latter still remain. The piles of this village, numbering about 100,000, were of oak, beech, and fir, some of them being split, were 10 or 11 ft. long, sharpened with stone hatchets, and driven in from 2 to 3 ft. apart. The platform was made of cross timbers and boards, fastened to the piles with wooden pins. The outermost piles were bound together with hurdle work. Investigation revealed three systems of piles, one above the other, indicating different periods of habitation. The piles of the two lower systems are round stems of soft wood, those of the uppermost split trunks of oak. Here were found mealing stones, hearth stones, wheat and barley, 8 lbs. of bread, burnt apples and pears, beech nuts, acorns, cherry stones, flax, cords, nets, mats, and woven cloth of bast and of flax, an abundance of broken pottery, many

flint weapons, tools of horn and bone, several implements of maple wood, two or three long bows such as are still used by the South sea islanders, and a canoe 12 ft. long, 1½ ft. broad, and 5 in. deep. The relic bed is 3 ft. thick. It is conjectured that the settlement was inhabited for many centuries, and that the first two structures were destroyed by fire, as the heads of the piles are charred and quantities of charcoal are found in the relic bed. The direction and arrangement of the masses of charcoal suggest that at least one of the fires occurred during the strong south wind (*Föhn*) by which at some time nearly every town in Switzerland has suffered. Almost the entire shore of the Untersee was lined with lake dwellings; those at Wangen have been most carefully explored and have yielded a greater abundance of articles than any other. Here were found numerous spindle whorls of clay, charred flax in all stages of manufacture, baked bread, and nearly 100 bushels of grain. Fascine structures are found at Niederwyl and Wauwyl. In the former split stems and boards were largely used, and some of the beams were mortised. There is no trace of burning. At Nidau-Steinberg, on the lake of Biene, is a lake settlement in which have been found manufactured articles of wood, horn, bone, clay, flint, bronze, iron, and gold. It is especially rich in bronze relics, consisting of hatchets, knives, sickles, spear heads, chisels, pins, needles, fish hooks, rings, and wire. The articles of iron include spear heads and two curved plates riveted to a piece of wood be-

large. At Morges the moulds for casting bronze hatchets were found. But in none of the lake dwellings is there any evidence of the use of the potter's wheel. The only one of the Swiss lake dwellings which bears the distinctive characters of the iron age is at Marin, on the lake of Neufchâtel. Here were also found rings, balls, and beads of glass, colored blue and yellow, and portions of eight human skeletons, including one skull. The number of iron weapons and implements found here is very large, and many of them are ornamented. Dr. Keller declares that "these ornamentations do not show the least relation to the Celtic implements which have come to light, and quite as little to those of Roman origin." He believes that the swords and lance points came from the workshops of Gaul.—Various attempts have been made to estimate the age of these lake dwellings, the form and size of the superstructures, and the number of inhabitants; but the figures obtained are largely the result of conjecture, and have very little value. Nor is it certain what was the exact reason for building on the water instead of on land. Protection from hostile tribes, safety from wild beasts, and convenience for fishing have been suggested, but are far from satisfactory. It seems pretty clear that they were not merely temporary abodes, that domestic animals as well as human beings were housed in them, and that some of them were abandoned without being burned. The scarcity of human remains is an enigma to archæologists, and not the slightest clue appears as to the manner in which the lacustrians disposed of their dead. Dr. Oswald Heer, in his work on the plants of the lake dwellings, says they show connection with the countries of the Mediterranean, but none with eastern Europe. The cereals were identical with those of the ancient Egyptians. The fauna of the lake dwellings includes a large number of fishes and birds still common to the country (but with no trace of any domestic fowl), and the bear, the dog, the ass, the ibex, the sheep, the cow, the hog, and other large animals, many of them belonging to extinct species. Since the discovery of the lake dwellings of Switzerland, similar structures have been found in Italy, Bavaria, Saxony, the French Jura, and other parts of Germany and France, and in Denmark.—The first discovery of crannoges in Ireland was made by William R. Wilde in 1839, near Dunshaughlin, county Meath. The lake of Lagore being drained, a circular mound 520 ft. in circumference, which had been known as an island, was seen to be of artificial construction. Oak piles had been used, mortised into planks laid flat on the bottom of the lake, and strengthened with cross beams. Some of the piles were grooved to hold panels which were driven down between them. The space within was filled with peat intermingled with bones of horses, asses, deer, sheep, goats, dogs, and foxes, and contained a large number of ornaments, weapons, and



Bronze Implements from Unter Uhldingen.—1. Sickle. 2. Pin. 3. Fish hook. 4. Socketed celt. 5. Knife. 6. Lance point. 7. Pin.

tween them; the articles of gold are a corrugated plate and a spiral of square wire. Some of the piles in this settlement are 10 in. in diameter, and were sharpened by the action of fire. Much of the pottery found here was unbroken, and some of the vessels were very

utensils of wood, bone, stone, bronze, and iron; 150 cart loads of bones were taken out. The ancient annals of Ireland relate that the island in Lake Lagore was plundered and burned by a hostile chief in 848, and that the buildings were pulled down by Norse pirates in 933. More than 50 crannoges have since been discovered in Ireland, and as many in Scotland. The latest discovery in Scotland (1871) is in Loch Etive, a platform 60 ft. in diameter, with a dwelling 50 by 28 ft. No essential difference of construction has been noted between those of the two countries.—See Keller, *Die Pfahlbauten in den Schweizerseen* (3 vols., Zürich, 1854-'60; English translation, London, 1866); Troyon, *Habitations lacustres* (Lausanne, 1860); Rutimeyer, *Die Fauna der Pfahlbauten* (Basel, 1861); Schaub, *Die Pfahlbauten in den Schweizerseen* (Zürich, 1864); Heer, *Die Urwelt der Schweiz* (Zürich, 1864-'5; English translation, "Primeval Life in Switzerland," London, 1874), and *Die Pflanzen der Pfahlbauten* (Zürich, 1865); Lyell, "Antiquity of Man" (London, 1863); Lubbock, "Pre-Historic Times" (London, 1869); and "Palafittes of the Lake of Neuchâtel," by E. Desor, in the Smithsonian report for 1865.

**LAKE OF THE WOODS** (Fr. *Lac des Bois*), a body of water in the Northwest territories of Canada, on the frontier of Minnesota, about lat. 49° N., lon. 95° W. It is 300 m. in circumference, and has an irregular outline indented with bays. A vast number of small islands dot its surface. The Winnipeg river flows from it on the north, and it receives Rainy river on the south. Wild rice grows plentifully along its shores.

**LALANDE, Joseph Jérôme Le Français de**, a French astronomer, born in Bourg-en-Bresse, July 11, 1732, died in Paris, April 4, 1807. His family name was Le Français, but he assumed that of Lalande at the outset of his scientific career. He was educated in the college of the Jesuits at Lyons, and was sent to Paris to study law; but making the acquaintance of De Lisle, he devoted himself to astronomy under him and Le Monnier. The latter in 1751 procured him a scientific mission to Berlin, where he was to ascertain, through astronomical observations, the distance between the earth and the moon, while La Caille was making similar observations at the Cape of Good Hope. He was presented to Frederick the Great, and, although but 19 years old, was made a member of the Berlin academy of sciences. On his return in 1753, he was elected to the French academy of sciences, assisted Clairaut in his researches on comets, especially that of Halley, and in 1760 became the editor of the *Connaissance des Temps*, which he conducted till 1775, and subsequently from 1794 till his death. In 1762 he succeeded De Lisle in the chair of astronomy at the collège de France, and during 45 years delivered lectures on that science. He reached the height of his fame when he published a map illustrating the

two transits of Venus which were to take place in 1761 and 1769, and showing the exact time of those transits for all countries on the globe. About the same time he announced to the world the results of the calculations through which the distance between the sun and the earth had been definitely ascertained. He gave much attention to navigation, and delivered lectures and published works on this subject, which are highly valued. But the popularity acquired by his scientific labors did not satisfy his thirst for fame; and in order to keep public curiosity constantly alive, he stationed himself on the Pont-Neuf to give astronomical explanations to passers by; announced that he would travel in a balloon from Paris to Gotha, where a scientific congress was to be held; had it reported that he ate spiders, caterpillars, worms, and other insects; and professed the boldest atheism. Lalande's principal work is the *Traité d'astronomie* (2 vols. 4to, Paris, 1764), which exceeded in utility all previous treatises of the kind.

**LALEMANT**, a Parisian family, of which several members were prominent in the early French missions in Canada. **I. Charles**, born Nov. 17, 1587, died in Paris, Nov. 18, 1674. He became a Jesuit in 1607, and in 1625 went to Canada, where he was superior of the missions. While going with ships to the relief of Quebec in 1629, he was wrecked near the mouth of the St. Lawrence, and narrowly escaped, some of his associates being drowned. He returned to Canada in 1634, after its restoration by England, when he took charge of the church of Notre Dame de Recouvrance in the lower town of Quebec, and opened the first school. After attending Champlain on his deathbed he returned to Europe in 1638, was rector of colleges at Rouen, La Flèche, and Paris, superior of the professed house, and vice provincial. Several of his letters have been printed: *Copie de trois lettres écrites es années 1625 et 1626* (Albany, 1870, reprinted from Sagard and Martin); *Lettre envoyée au P. Hierosme l'Allemant, où sont contenus les mœurs, &c., des sauvages* (Paris, 1627, and in the *Mercurie Français*, 1628; both, Albany, 1870); *Lettre envoyée de Bordeaux*, describing his shipwreck, published in Champlain (Paris, 1632; Albany, 1870). **II. Jérôme**, brother of the preceding, born in 1593, died in Quebec, Jan. 26, 1673. He entered the Jesuit order in 1609, and went to Canada in June, 1638, having been rector of several colleges in France. He was on the Huron mission till 1645, and was superior of all the missions in Canada from 1644 to 1650; made two voyages to France, where for a time he was rector of the college of La Flèche, but returned again in 1659 with Bishop Laval as superior of the missions, having been recommended to the king by the Canada company for the bishopric. He is the author of five of the "Jesuit Relations" of the Huron missions, and of six of the general volumes, for the years 1645-'8 and 1661-'4. **III. Gabriel**,

nephew of the preceding, born Oct. 30, 1610, killed March 17, 1649. He also entered the society of Jesus (1630), went to Canada in September, 1646, and was sent to the Huron mission. In the overthrow of that nation by the Iroquois he fell into the hands of the savages, and with Father Brebœuf was put to death with exquisite torture, prolonged for many hours.

**LALLEMAND, Claude François**, a French physician, born in Metz, Jan. 26, 1790, died in Marseilles, Aug. 25, 1854. After serving as assistant surgeon in the armies of the empire, he studied in Paris at the Hôtel-Dieu under Dupuytren, and from 1819 to 1845 was professor of clinical surgery at Montpellier, with the exception of three years during which he was suspended for his liberal political expressions. His most important work, the *Recherches anatomico-pathologiques sur l'encéphale et ses dépendances* (Paris, 1820-'36), established his reputation, and was translated into many languages. In 1845 he was elected to the academy of sciences, and removed to Paris, and was consulted by patients from every part of Europe. He bequeathed 50,000 francs to the institute.

**LALLY, Thomas Arthur**, count, baron of Tulledally or Tollendal, in Ireland, a French soldier, born in Romans, Dauphiny, in January, 1702, beheaded in Paris, May 9, 1766. He was the son of Sir Gerard Lally, an Irish loyalist, who accompanied James II. in his exile to France. He was educated to the profession of arms, and when scarcely 12 years old performed his first military service at the siege of Barcelona. For his gallantry at the sieges of Kehl in 1733 and Philippsburg in 1734, where he saved his father's life, he was promoted to the rank of major. In 1737 he visited England, Ireland, and Scotland, with a view to promote the interests of the pretender; and in 1738 he was sent on a secret mission to St. Petersburg. In 1745 he distinguished himself at the battle of Fontenoy, where he led the Irish brigade whose gallantry secured victory to the French. Louis XV. made him brigadier general on the field. The same year, at the head of a body of volunteers, he landed in Scotland, joined the young pretender Charles Edward, and served as his aide-de-camp at the battle of Falkirk. In 1755, being consulted by the French ministry upon the best mode of impairing the power of England, he strongly urged an attack upon her East Indian possessions. He was offered the command of an expedition to carry out his plan, received the appointment of governor general of the French establishments in the East, and sailed for his destination, May 2, 1757. But the means which had been placed at his disposal were wholly inadequate. He landed at Pondicherry, April 28, 1758, and found that the agents of the French East India company were secretly against him. Nevertheless, the Coromandel coast was conquered in a few weeks. He overcame all the obstacles thrown in his way, laid siege to Madras in

the month of December, carried the Black Town, and had some prospect of success; but being unsupported by D'Aché, the commander of the French fleet, and having no money to pay his mutinous soldiers, he was finally obliged to retire on the arrival of an English fleet. Soon after he found himself besieged in Pondicherry by an enemy ten times his superior in numbers. He held out for ten months; but deserted by his fleet, betrayed by the agents of the French company, having exhausted his resources, and the garrison being reduced to 700 men, he was finally compelled to surrender at discretion, Jan. 14, 1761, to Gen. Coote, who had 22,000 troops under his command and was supported by 14 ships. He was carried as a prisoner to London; but having heard that he was charged by his personal enemies with various crimes, he obtained his release on parole, went to Paris, and voluntarily entered the Bastille, in order to hasten his trial, but was left there for 19 months without examination. Finally he was accused as a traitor and a defaulter by the men who had been the cause of his ruin, and a mock trial took place; witnesses of the worst character, some of whom were his own servants, were admitted to testify against him; he was refused counsel, and was not even allowed to present his defence; and at last, after a protracted secret deliberation, he was sentenced to death and executed. Several years afterward the whole of these proceedings were revised, and the sentence was finally reversed in 1778.

**LALLY-TOLLENDAL, Trophime Gérard**, marquis de, a French politician, son of the preceding, born in Paris, March 5, 1751, died March 11, 1830. Although of legitimate birth, he was brought up, under the name of Trophime, in ignorance of his parentage until the eve of his father's execution. He first made himself known by his untiring efforts, during 12 years, to procure the reversal of his father's sentence, in which he secured the assistance of Voltaire, who wrote in his behalf. In 1789 he was one of the deputies of the nobles to the states general; he supported moderate reforms, and favored the establishment of a constitutional monarchy with two chambers and an absolute power of veto vested in the king; but after the events of Oct. 5 and 6 he was so alarmed at the course of the revolutionists that he retired with Mounier to Coppet in Switzerland. There, under the title of *Quintus Capitolinus aux Romains*, he published in 1790 a pamphlet censuring the proceedings of the constituent assembly. He returned to Paris in 1792 to oppose the Jacobins, and was imprisoned, but escaped to England a few days previous to the September massacre. In 1793 he asked to be appointed one of the counsel of King Louis XVI., but was not answered. He returned to France after the 18th Brumaire, and lived in retirement until the return of the Bourbons, when he was made a peer.

**LAMA.** See LLAMA.

**LAMAISM** (Thibetan, *bLama*,\* lord, master, teacher), the prevailing religion of Thibet and some other parts of Asia. It is a form of Buddhism modified by the adoption of some of the doctrines and practices of Sivaism, one of the religions of India, and Shamanism or spirit worship, a Mongolian superstition. The most essential features of Lamaism are described in the article **BUDDHISM**, vol. iii., pp. 399 *et seq.* Of the religion of Thibet previous to the introduction of Buddhism nothing certain is known. According to the Thibetan and Chinese annals, a king of Thibet named Srong-bTsan-sGam-po (the upright wise prince), who reigned in the early part of the 7th century, was the introducer of Buddhism into that country. He had two wives, one from China, the other from Nepal, in both which countries Buddhism had been established for several hundred years. These princesses brought with them Buddhistic books and idols. For the preservation of the latter, temples were built at Lassa (*Lha-ssa*, god-land), which afterward became and still remains the great metropolis of Lamaism. In 632 Srong-bTsan sent his prime minister Thumi-Ssam-bho-ta to Nepal to study Buddhism, and to adapt the Devanāgarī or Sanskrit alphabet, to the Thibetan language. This king also introduced the wonderful mystic formula of six syllables, *Aum ma-ni pad-me hum*, which is supposed to mean, "God! jewel in the lotus, Amen." It is a kind of universal prayer or invocation, and great spiritual and corporeal benefits are attributed to its utterance. During the century following the death of Srong-bTsan, Buddhism made but little progress in Thibet; but it received a new impulse from Thi-Srong-de-bTsan, who reigned from 740 to 786. He built many monasteries, invited to his court learned men from India, and completed the translation of the *bKa' hGyur* (pronounced *Kanjur*, *versio verbi*), the great canon in three sections, and containing, in 100 volumes, 1,083 different works, treating of everything connected with the doctrines and discipline of Buddhism. The third king who is regarded as sacred by the Lamaists was Khride-Srong-bTsan, who increased the power of the priesthood until it became unendurable, and he was murdered by the supporters of his brother gLang-dar-ma, between 821 and 840. The latter immediately commenced a bloody persecution of Buddhism, in consequence of which the priests called him a *khubilghan* of Shisnus, or incarnation of the devil, and finally murdered him; but for a long time afterward the religion made little progress. In the 11th century a learned Buddhist, Jo-bo-Atisha, introduced several reforms, and by his efforts and those of his Thibetan disciples, especially Brom-bakshi, a new impulse was

given to the religion. New monasteries were established, and Kun-dGa-sRing-po, abbot of the monastery of Ssa-skya, about 1070, is said to have been the first grand lama of Thibet; but it is not certain that his authority was universally recognized. In the 13th century the greater part of Thibet was subject to China, and in 1279 it passed with the rest of the empire under the dominion of Kublai Khan, grandson of the Mongol conqueror Genghis Khan. Kublai Khan was a patron of learning and became a Buddhist. He took the lama of Ssa-skya under his protection, and subjected the whole country to his authority. This lama, who among his numerous titles bore that of *Ti-ssu*, emperor's teacher, is said to have contrived letters for the Mongolic language. Kublai and Ti-ssu, with the aid of Thibetan, Uiguric, Chinese, and Sanskrit scholars, revised the *Kanjur*, and it was printed at the sNar-thang monastery in 1285-1306. He also sent an embassy to Ceylon, which brought back the bhikshu bowl, two molar teeth, and a miraculous image of Sākyamuni. The successors of Kublai were equally zealous. Temples were restored, convents were erected in China as well as Thibet, and so many Chinese pretended to be monks in order to escape payment of taxes and the performance of other duties, that it is said 500,000 of these impostors were expelled from the cloisters of a single province. After a rule of 89 years the Mongol dynasty called by the Chinese the dynasty of Yu-en was expelled, and in 1368 the Ming dynasty was established. In 1373 Tai-tsu, the Chinese emperor, desirous of lessening the power of the lama of Ssa-skya and of increasing the influence of China, conferred equal dignities and titles upon four lamas. This policy of dividing and thus weakening the power of the lamas was followed by the succeeding emperors, though the lama of Ssa-skya was still regarded as the highest in dignity. In 1403 a lama named bTsong-Kha-pa commenced a great reform. Many wonderful legends of his miraculous conception and birth are preserved, and he is regarded in Thibet, Mongolia, and among the Calmucks with almost as much reverence as Buddha himself. He proclaimed the duty of celibacy on the part of the priesthood, originated the sect or order of *dGe-lugs* (of virtue), wrote many works, and founded many monasteries. Previous to his time one of the distinguishing marks of the priesthood had been a red cap. He and his followers adopted a yellow cap, as being more in accordance with the original custom of the Buddhists. The Lamaists thus became separated into two sects, which to this day are called red-caps and yellow-caps, but at present the sect of red-caps in Thibet is very small and of little importance. Some time between 1417 and 1429 bTsong-Kha-pa died, or, as his followers believe, was translated to heaven.—The organization of the lamaistic hierarchy as it exists at the present day is essentially the same as it was left by

\* Throughout this article a small letter unaccompanied by a vowel and immediately followed by a capital, is not pronounced; thus *bLama* is pronounced Lama. Such is the Thibetan spelling and pronunciation.



bTsong-Kha-pa. At the head are two lamas of equal sanctity, who consecrate each other. The one is called dalai lama, *dalai* being a Mongol word signifying "ocean." In the Tibetan language dalai is rGya-mThso, but the Mongol word is generally used. He resides at Potala near Lassa. The other is called pan-tchhen lama, *pan-tchhen* signifying great-teacher-jewel, but used very much as our words "right reverend." He is also called tesho lama and bogdo lama, especially in Europe. He resides at bKra-Shiss-Lhun-po, near gShiss Ka rTse or Dzigartchi. Both lamas have many other titles, the chief of which are rin-po-tchhe, precious jewel, and rGyal-po, king. Although in theory the two lamas are in all respects equal, yet the dalai lama presides over a far greater territory and his influence is much greater than that of the bogdo lama. Their followers believe that these two lamas never really die. When the body of one of them perishes, he immediately becomes incarnate in some boy of four or five years, who must be found by the lamas next in dignity to the two highest, under the direction of the surviving grand lama, and taken under their care to be educated for his high office. Many solemn forms are gone through with, and the child when found is subjected to many tests to determine whether he is the real incarnation of the departed lama. As a matter of fact, however, at the present day the choice always falls upon some one satisfactory to the emperor of China. The dalai lamas are supposed to be the successive incarnations of Avalokitesvara, a bodhisattva, and the patron saint of Thibet, while the bogdo lamas are regarded as incarnations of the great reformer bTsong-Kha-pa, himself, according to the prevailing opinion, an incarnation of the bodhisattva Amitâbha. Jo-bo-Atisha and Brom-bakshi are considered the prototypes of the double lama papacy. The next in rank to the two grand lamas are the *khutuktus* or vicars, who may be compared to the cardinals and archbishops of the Catholic church. Of these there are from seven to ten, though some authorities place the number much higher. They represent the authority of the dalai lama in the different provinces, and almost all the civil power is also in their hands. They are khubilghans, or incarnations of former saints, and share with the grand lamas the right to the title *rin-po-tchhe* or precious jewel. Women sometimes attain to this rank. The third class is composed of those who are called simply khubilghans or incarnates. This is a Mongol word, but much more generally used than *byangtchhab*, the corresponding Tibetan name, and a translation of the Sanskrit *bodhisattva*. Their number is very great. They are at the head of a large proportion of the monasteries, and fill other important offices. The two grand lamas, the *khutuktus*, and the khubilghans constitute that portion of the hierarchy to whom, as being the incarnations of former existing saints, a peculiar sanctity is

attached. They are principally taken from privileged families, and political considerations have more or less influence in their selection. The second great division of the hierarchy is composed of four classes, which in ascending order are as follows: 1, the *genyen* (virtue-nourished) or novice, who is generally from 7 to 15 years old; 2, the *getsul*, or deacon, generally from 15 to 20 years old; 3, the *gelong* (virtue-beggar), or fully consecrated monk or priest, who must be over 20 years old; 4, the *khanpo* or teacher, master. The last are the abbots of the great monasteries, and often one *khanpo* has several smaller monasteries under his supervision. The third and last great division constitutes what may be called the academical or theological order. It is composed of: 1, the *kabtchee*, master, those who have given evidence in a public examination of their acquaintance with the ten most important books of the lamaistic religion; 2, the *rabjampa*, the overflowing, those who in a public discussion have shown their knowledge of the whole body of religious learning, and who are authorized to give instruction in the law, and are connected with those monasteries to which high schools are attached. There are two other learned degrees, which are conferred by the grand lamas only on persons who have distinguished themselves by extraordinary learning: the *tchoiji* or law-prince, and the *pandita*, which, as denoting the highest possible attainments, is very rare.—In no part of the world do the religious orders constitute so large a proportion of the population as in those countries where Lamaism is the prevailing faith. There are many vagabond or begging lamas, and a few hermits who live in caves. With these exceptions all lamas are monks or nuns, and are vowed to celibacy. The female lamas are called sisters-in-law, venerable aunts, &c., and are divided into classes corresponding to those of the male lamas. In Mongolia the lamas are estimated at one eighth of the whole population. The chief lama, or *gegen khutuktu*, is considered equal in rank to the two grand lamas of Thibet. He resides at Urga, on the road from Peking to Kiakhta, with about 20,000 monks and 30,000 families of slaves. In Thibet the great metropolis of Lamaism is Lassa, in which city and its neighborhood are 30 great lamaseries. The chief of these are Potala (Buddha's mount), the residence of the dalai lama and occupied by about 10,000 lamas; Sse-ra (golden), with 15,000 lamas; Brass-ssPungss (branch-heap), with a Mongolic school, 300 sorcerers, and 15,000 lamas; and dGa' iDan (joy of heaven), with 8,000 lamas. The two last named were founded by the great reformer bTsong-Kha-pa. These are not exceptional cases, but are specimens of hundreds of others which are scattered throughout central Asia. To several of them printing offices are attached. This vast horde of priests and monks are supported partly by their own labor, partly by the revenues

derived from their immense landed estates, and partly from the practice of arts founded on the superstitious reverence in which they are held by the rest of the population. They are physicians, astrologers, fortune-tellers, and magicians. Children are baptized on the third or tenth day after birth, and are confirmed as soon as they can speak and walk. These ceremonies must be performed by the lama. Marriage is a civil and not a religious rite, but the auspicious day for its performance can only be learned from the lama, and it is considered highly important that it should be accompanied by his prayers. The interment of the dead is forbidden, and there are no funeral ceremonies requiring the presence of the lama. After death the bodies of distinguished persons and of wealthy laymen are burned. The bodies of the common people are exposed to be devoured by beasts and birds of prey, or by sacred dogs kept for the purpose; but the auspicious day and hour when and the place where the body must be exposed must be determined by the lama. When rich persons are about to die, the lama must be present to assist the departure of the soul by making a small hole in the scalp. He also says masses for the departed soul until it is released from Yama, the infernal judge, and is ready to enter upon its new existence. For these and numberless other services the lama must be rewarded according to the means of the person for whose benefit they are rendered. The lamas also make and sell idols, amulets, relics, consecrated pills, and other things of this kind. They print all the books, and to them literary education is almost exclusively confined. There are three great festivals, and innumerable smaller ones. The first great festival, in commemoration of the victory of Sakyamuni over the six heretic teachers, is celebrated at the time of new moon in February. It also marks the commencement of the new year and of spring, and hence the victory of warmth and life over darkness and cold. It is the Thibetan carnival, and lasts for 15 days, during which the population abandon themselves to every kind of pleasure. The second is held in commemoration of the incarnation of Sakyamuni, and is the oldest festival of Buddhism. It marks the commencement of summer, and is characterized by the procession of idols. The third is the water festival at the commencement of autumn. Of the other festivals, the most important is the lamp festival, in commemoration of the translation to heaven of bTsong-Kha-pa. There are also a great number of fasts, the objects and characteristics of which it would be tedious to enumerate. Small chapels, prayer wheels, the turning of which is considered equivalent to the utterance of the prayers inscribed upon them, sacred inscriptions on walls and columns, and silken flags inscribed with prayers and hoisted upon consecrated poles, abound in the streets and along the highways. The lamas assemble three times each day for worship, at sunrise, noon, and sun-

set. The worship consists principally in the recitation of prayers and sacred texts, accompanied by a chaotic clamor of horns, trumpets, and drums. When the grand lama appears in public he sits cross-legged, is clothed in splendid robes of fine woollen or silk richly wrought with gold, and distributes his blessings in silence by the motion of his hands. The architecture of the lamaic temples is a mixture of the Chinese and Indian styles. They are square, and in Thibet always face the east, in Mongolia the south. They are divided into three apartments, the entrance hall, the main hall with two parallel rows of columns, and the sanctuary in which are the chief idol, the altar, and the throne of the chief lama. The walls are generally painted in lively colors, and the halls adorned with carpets, statues, and various ornaments. The temple is surrounded by the buildings necessary to supply the temporal and spiritual wants of the lamas, the whole forming the *dGon-pa*, monastery or lamasery.—The great body of lamaic literature is contained in two immense collections: the *bKwa hGyur* or *Kanjur* mentioned above, a copy of which is in the national library at Paris, and the *bsTan hGyur* (pronounced *Tanjur*), in 225 volumes, which consists mostly of translations from Sanskrit and Prakrit of treatises on dogmas, philosophy, ethics, medicine, grammar, and other sciences, of fragments of epic poems, vocabularies, and various other matters. The imperial library of St. Petersburg possesses both these collections. The *Kanjur* is regarded as sacred, the *Tanjur* merely as high authority. Only a very small number of lamas possess any real knowledge of either collection. Like other Buddhists, the Lamaists recognize no worship of gods. The essence of all that is holy is comprised in an ideal trinity designated by the name *dKon-mTehhog-gSum*, three precious jewels, viz., the Buddha, the doctrine, and the priesthood. Far beneath these are many good and evil beings, partly gods borrowed from the Indian pantheon, partly spirits from the ancient religions of the Mongol nations. The intervention of the lamas is necessary to propitiate these and ward off their evil influence, but they are not properly objects of worship.—See Csoma de Körös, "Asiatic Researches," &c.; Huc, *Souvenirs d'un voyage dans la Tartarie, le Thibet et la Chine* (Paris, 1852; English translation by W. Hazlitt, 2 vols. 12mo, 1852); Karl Ritter, *Erkunde von Asien*; K. Fr. Köppen, *Lamaische Hierarchie*, &c. (Berlin, 1859).

**LAMANTIN.** See MANATEE.

**LAMAR**, a N. E. county of Texas, separated from the Indian territory by Red river, and bounded S. by the N. fork of Sulphur river; area, about 950 sq. m.; pop. in 1870, 15,790, of whom 4,410 were colored. It has an uneven surface, diversified by woodlands and fertile prairies, and suitable for grazing. The chief productions in 1870 were 5,390 bushels of wheat, 474,361 of Indian corn, 9,104 of oats, 16,347 of sweet potatoes, and 6,753 bales

of cotton. There were 5,037 horses, 1,090 mules and asses, 5,196 milch cows, 1,061 working oxen, 14,249 other cattle, 3,986 sheep, and 22,030 swine; 3 manufactories of furniture, 5 of saddlery and harness, and 2 flour mills. Capital, Paris.

**LAMARCK, Jean Baptiste Pierre Antoine de Monet** de, a French naturalist, born at Bazentin, Picardy, Aug. 1, 1744, died in Paris, Dec. 18, 1829. He was a younger son of a noble family, formerly of Béarn, and being destined for the church was sent to the Jesuits' college at Amiens; but his father dying when he was 17 years old, he left his studies and joined the army under the duke de Broglie. He served until the close of the seven years' war, when he became incapacitated for military duty by an accident, returned to Paris, and studied medicine and the physical sciences. In 1776 he began his career as an author by the publication of his *Mémoire sur les vapeurs de l'atmosphère*. In 1778 he published his *Flore française*, containing a new arrangement of plants which was commended by Buffon and the academy of sciences. About the same time he accompanied the younger Buffon on a tour through Germany and Holland to procure botanical specimens; and he became also a companion in the botanical excursions of J. J. Rousseau. Being appointed editor of the botanical department of Panckoucke's *Encyclopédie méthodique*, the results of his researches were embodied in that work. The outbreak of the French revolution interrupted it and terminated Lamarck's botanical labors. In 1793, although he had given comparatively little attention to zoölogy, he was intrusted with the department of invertebrata in the museum of natural history in Paris. This branch of natural history became thenceforth the absorbing study of his life, and his lectures upon it, begun in 1794, were continued until the failure of his eyesight in 1818 incapacitated him for the duty. His first important work on this subject, *Système des animaux sans vertèbres* (1801), was the forerunner of a more elaborate treatise published many years later. In 1809 appeared his *Philosophie zoologique* (2 vols. 8vo), in which his theory of the development of animal functions, previously hinted at in an early work, is set forth at considerable length. It was his opinion that new organs could be produced in animals by the simple exertion of the will, called into action by the creation of new wants; and that the organs thus acquired could be transmitted by generation. In support of this doctrine, which is called appetency, he cited the existence of tentacula on the head of the snail, which derive their origin from the desire of the animal, united with endeavor perpetuated and imperceptibly working its effect through a series of generations, to possess organs capable of examining the bodies it encounters; and the same thing, he asserted, had happened "to all races of gasteropods, in which necessity

has induced the habit of touching bodies with some part of their head." He was an advocate also of spontaneous generation, and he believed that all organized beings, from the lowest to the highest forms, were developed progressively from similar living microscopic particles. He is considered the foremost modern originator of the theory of the variation of species, which Darwin has revived and developed. In 1815-'22 appeared Lamarck's chief work, *Histoire naturelle des animaux sans vertèbres* (7 vols. 8vo), by far the most comprehensive treatise on the invertebrata which had appeared, and of which the edition of 1834-'45, with notes by Deshayes and Milne-Edwards, is a standard manual on the subject. His division of the animal kingdom includes three groups, the apathetic, the sensible, and the intelligent. The first comprises *infusoria*, *polyparia*, *radiaria*, and *vermes*; the second, *insecta*, *arachnida*, *crustacea*, *annelida*, *cirripeda*, and *mollusca*; and the third, *pisces*, *reptilia*, *aves*, and *mammifera*. Some of his statements respecting the habits and functions of the apathetic animals have been disproved by the researches of Ehrenberg and other naturalists. His last work was his *Mémoires sur les coquilles*, published in the *Annales du muséum*, in which he was assisted by Valenciennes, and by his daughter.

**LAMARMORA, Alfonso di**, marquis, an Italian general, born Nov. 17, 1804. He was admitted to the military academy of Turin in 1816, and left it in 1823 with the rank of lieutenant of artillery. He took an active part in introducing reforms into the organization of the army, in the war against Austria in 1848, and in restoring order after the defeat at Novara in 1849. In 1855 he was commander of the Sardinian forces in the Crimean campaign, and in that of 1859 was the principal military adviser of Victor Emanuel. He also officiated on several occasions as minister of war and marine. After the peace of Villafranca and the retirement of Cavour, he was for a time chief of the cabinet, a position which he again held in 1864-'6, after having served on missions to Berlin and St. Petersburg, and as commander in Milan and Naples. In 1866 he concluded through Gen. Govone the alliance with Prussia, and resigned his premiership in order to take as chief of staff the virtual command of the army in the field. The defeat at Custozza (June 24), which was attributed to his mismanagement of the campaign, caused his retirement, and involved him in disagreeable controversies. In 1867 he was sent to Paris, subsequently became member of the Italian parliament, and in 1870-'71 was governor of Rome. In 1873 he published a volume of diplomatic memoirs, which made an immense sensation by the assertion that Bismarck in his negotiations with Gen. Govone in 1866 declared himself willing to cede a portion of Transhrenan Germany to France, in order to secure the friendly attitude of Napoleon III. in the impending war with Austria; a

statement which the German chancellor vehemently denied.

**LAMARQUE, Maximilien**, count, a French general, born in St. Sever, July 22, 1770, died in Paris, June 1, 1832. He enlisted in the army in 1791, was sent to Spain, reached the rank of captain, and joined the corps styled the *colonne infernale*, under the command of Latour d'Auvergne. In 1794, at the head of 200 soldiers, he stormed Fuenterrabia, for which he was rewarded with the rank of adjutant general, and a decree of the convention declared that he had "merited well of his country." After the peace with Spain, he served under Dessolles and Moreau on the Rhine, distinguished himself at Hohenlinden, and was made a brigadier general in 1801. He afterward joined the army under Napoleon, and participated in the battle of Austerlitz. He shared in the invasion of Naples, was present at the taking of Gaëta, smothered the insurrection in Calabria, and worsted some British detachments in 1807. In the same year he was made general of division, and in 1808, under Joachim Murat, who had succeeded Joseph Bonaparte as king of Naples, he captured the island and fortress of Capri, which was defended by the English garrison under Sir Hudson Lowe. He subsequently distinguished himself at Wagram, where he had four horses killed under him; and in Spain, where he led the rear guard when the French evacuated the Peninsula. On the return from Elba, Napoleon appointed him to the command of Paris, and sent him to the west against the royalists. On the second restoration he was exiled and retired to Brussels, where he devoted his time to literature, art, and the education of his son. In 1818 he was allowed to return to France, and settled in his native town. In 1828 he was elected to the chamber of deputies by the department of Landes, and took his seat among the opposition. He was one of the 221 members who boldly declared against the policy of Charles X. in 1830, but after the accession of Louis Philippe opposed the ministry, and bitterly denounced the system known as that of peace at any price. His honesty of purpose, sincerity, and martial eloquence gained him great popularity. His funeral, which took place June 5, 1832, was attended by a large concourse of citizens; and the republicans took advantage of it to raise a formidable insurrection in the most populous districts of Paris. The whole army in Paris and the national guard marched against the insurgents, who yielded after nearly 48 hours of bloodshed.

**LAMARTINE, Alphonse Marie Louis de**, a French poet, born in Mâcon, Oct. 21, 1790, died in Paris, March 1, 1869. His early education was superintended by his mother at the village of Milly, near Mâcon, where his father, who had passed the reign of terror in prison, had retired on the fall of Robespierre. In his 12th year he was sent to study Latin under a neighboring priest, who, a sportsman as well as an

ecclesiastic, afterward furnished the subject of *Jocelyn*. He was soon transferred to the college of Lyons, and again to the school of the Jesuits at Belley, whence he returned in 1809 to Milly and devoted himself to the reading of the poets. In 1811 he accompanied a relative to Italy. Near the close of the empire he returned to France, entered the royal body guards in 1814, and on the escape of Napoleon from Elba retired to Switzerland, returning to Paris after the second restoration. In 1817 he wrote his elegy of the *Lac*, in which he first displayed the ability of a great poet. His earliest published collection appeared in 1820 under the title of *Méditations poétiques*, and won a remarkable success, 45,000 copies being sold within four years. Soon afterward he was appointed secretary to the embassy at Naples. On his way thither he married at Geneva Miss Birch, a wealthy young English lady, who had received a brilliant literary and artistic education. In 1823 he published his *Nouvelles méditations*, which, though it contained many of his finest poems, was less popular than the preceding volume. In 1824 he became secretary of legation at Florence, and in 1825 appeared his *Dernier chant de Childe Harold*, an imitation of Byron, containing a severe tirade on Italy, which resulted in a duel with Col. Pepe, an Italian revolutionist, in which Lamartine was wounded. After a residence of five years in Florence, he returned to Paris, was received into the academy, and published *Harmonies poétiques et religieuses* (1830). In 1832 he set sail from Marseilles, with his wife and daughter, in a vessel chartered and furnished by himself, on a journey to the East, which had been the religious and romantic dream of his life. The French emir, as the Arabs called him, travelled like a sovereign, making princely presents, buying houses for his convenience, and having whole caravans of horses in his service. Leaving his family at Beyrout, he went alone to Jerusalem, where he heard of the death of his daughter. He returned to Paris after 16 months' absence, by way of Constantinople and the Danube, and published *Voyage en Orient, souvenirs, impressions, pensées et paysages* (4 vols., 1835), a work splendid in design, but in parts carelessly composed, and inexact in facts. During his absence the electors of Bergues, Le Nord, had chosen him to represent them in the chamber of deputies, in which he took his seat two months after his arrival in France. Though he acted with no political party, his eloquence gave him distinction, and many who doubted his aptitude for practical questions admired in his discourses the language of poetry applied to political affairs. In 1836 appeared *Jocelyn*, a poem of love and duty, announced as a journal found in a village curacy. It is one of his finest productions, combining dramatic movement with lyric fervor. Two years later followed *La chute d'un ange*, a poem whose negligences and extravagances justified the coldness of its

reception. Similar defects characterized his *Recueils poétiques* (1839). As an orator he made remarkable progress in the chamber. At once conservative and progressive, he stood between the ministry and the opposition, assailing the inflexibility of the one and the violence of the other. In 1842 he foreshadowed his ultimate adherence to the liberal side, by contending that the regency should be conferred on the duchess of Orleans by a vote of the chamber, thus asserting the principle of the national sovereignty; and in 1843 he broke definitely with the conservatives. He anticipated the subversion of the throne, and contributed powerfully to it in his brilliant *Histoire des Girondins* (8 vols., Paris, 1847). After the escape of the royal family, when the duchess of Orleans appeared in the last assembly of the chamber (Feb. 24, 1848) with her eldest son, the count of Paris, and an attempt was made to declare the latter king by acclamation, the eloquence of Lamartine decided the establishment of a provisional government, which he was among the first to propose. This included Dupont de l'Èure, who presided, Arago, Lamartine, Ledru-Rollin, Crémieux, Garnier-Pagès, Marie, Marrast, Flocon, Louis Blanc, and Albert. On the morning of the 25th, when the insurgent and famishing crowds appeared before the hôtel de ville, demanding bread and work, and the raising of the red flag, Lamartine advanced alone among them and gained his greatest triumph of eloquence. To his intrepid stand on this occasion it is mainly due that the republic did not pass immediately into a new reign of terror. He took the department of foreign affairs in the new government, and one of his first acts was to address a pacific circular to the ministers of foreign states, in which the design of forcible revolutionary propagandism was disavowed. His popularity was proved by his election to the national assembly (April 23) from 10 departments; but he fatally compromised himself by a coalition with Ledru-Rollin, and instead of receiving the first place in the executive commission which was to succeed the provisional government till the formation of a constitution, he was the fourth on the list, the others being Arago, who became president, Ledru-Rollin, Garnier-Pagès, and Marie. Crémieux, Carnot, Goudchaux, and others were attached as ministers. The "red" movement of May 15, under Blanqui, Barbès, Raspail, and others, having been subdued, Lamartine strove to prevent the insurrection of June, which the unsettled condition of labor and the socialist propaganda matured; but perceiving that the time demanded not reason but the sword, he favored the dictatorship of Gen. Cavaignac, and resigned his own executive office. He was supported for the presidency by Pelletan and La Guéronnière in the *Pays* newspaper, but received only 17,910 votes, and he was returned to the assembly in 1849 by but one obscure department. After the *coup d'état* of Dec. 2,

1851, he retired from public life. For several years his private affairs had demanded much of his attention. From the time of his oriental tour, the income of his writings and diminished fortune, and the illusive wealth of large territorial grants by the sultan, had been unequal to the expenditures incident to his elegant mode of life. He condemned himself therefore to indefatigable literary labors in the production of numerous works, often of ephemeral importance. His friends opened a subscription for him in 1858, but with unsatisfactory results. The municipality of Paris presented him in 1860 with a country seat near the Bois de Boulogne, and in 1867 the government of Napoleon III. gave him for life the income from a capital of 500,000 francs. His principal later publications are: *Trois mois au pouvoir* (1848); *Histoire de la révolution de 1848* (2 vols., 1849); *Confidences and Raphael* (1849), memoirs of his youth; *Toussaint l'Ouverture*, a drama (1850); *Geneviève* (1851); *Le tailleur de pierre de Saint-Point* (1851); *Histoire de la restauration* (6 vols., 1851-'3); *Visions* (1852), a poetic fragment; *Nouveau voyage en Orient* (1853); *Histoire des constituants* (4 vols., 1854); *Histoire de la Turquie* (6 vols., 1854); *Histoire de la Russie* (2 vols., 1855); *Regina* (1862); *Esprit de Mme. de Girardin* (1862); a series of literary portraits, *Bossuet, Antar, Cicéron, Christophe Colomb, Homère et Socrate, Nelson* (1863), *Héloïse et Abailard, Mme. de Sévigné, Shakespeare et son œuvre* (1864); *Civilisateurs et conquérants* (2 vols., 1865); *Les grands hommes de l'Orient, Vie de César, Les hommes de la révolution* (1865); *J. J. Rousseau, son faux contrat social et le vrai contrat social* (1866); *Vie du Tasse* (1866); and *Antoniella* (1867). He conducted at various times the periodicals *Le conseiller du peuple* (1849-'52), *Le civilisateur* (1852-'6), and the *Cours familier de littérature* (1856 et seq.). His *Correspondance* (4 vols., Paris, 1873 et seq.) was edited by his niece.—See Lacretelle's *Lamartine et ses amis* (Paris, 1872), Mazade's *Lamartine, sa vie littéraire et politique* (Paris, 1872), and *Vingt-cinq ans de ma vie*, translated into English by Lady Herbert (1872).

**LAMB, Lady Caroline.** See MELBOURNE.

**LAMB, I. Charles,** an English author, born in London, Feb. 18, 1775, died in Edmonton, Dec. 27, 1834. His father was servant and friend to one of the benchers of the Inner Temple, and published a volume of occasional verses which evince his humor and taste. His character is happily drawn under the name of Lovel in the essay of Elia on "The Old Benchers of the Inner Temple." In the Inner Temple Charles passed the first seven years of his life, and was then sent to the school of Christ's hospital, where he remained till his 15th year. Coleridge was his schoolfellow, and one of his earliest and most esteemed friends. But for a slight impediment in his speech he would have acquired a university education and taken orders. He was employed in the South sea house from 1789 to 1792, when he obtained an ap-



pointment in the accountant's office of the East India company, which he held until his retirement with a pension in 1825. To meetings with Coleridge on his visits to London, when they used to sup together at an inn, and sit in conversation nearly through the night, he attributed the first quickening of his intellect to literary activity; saying in a letter to him: "You first kindled in me, if not the power, yet the love of poetry, and beauty, and kindliness." There was a tendency to insanity in his family. He himself at the age of 20 was confined six weeks in a madhouse. He was not again affected, but the tendency was more strongly marked in his sister Mary. On Sept. 22, 1796, she killed her mother in a paroxysm of madness, and from this time she was subject to attacks of insanity. She always had premonition of them, and would indicate the moment when her brother should take her to the asylum. He devoted himself only to her, and admitted no connection which could interfere with his single care to sustain and comfort her. His first compositions were in verse, written slowly and at long intervals. His earliest printed poems are contained in a volume published conjointly with Coleridge and Charles Lloyd in 1797, and republished only in conjunction with Lloyd in 1798. In that year he produced also his prose tale of "Rosamund Gray," was associated with Coleridge and Southey in preparing a volume of fugitive poetry under the title of the "Annual Anthology," and was engaged in writing the tragedy of "John Woodvil," which was rejected by the managers, but was published in 1801. He made one other dramatic attempt, "Mr. H.," a pleasant farce, which was produced at Drury Lane theatre in 1806, with Mr. Elliston in the principal character. It was damned on the first night, and Lamb, who sat with his sister in the front of the pit, gave way to the common feeling, hissed and hooted as loudly as any one, and henceforth made a jest of the wreck of his dramatic hopes. He had already begun his studies of the old English authors, whom he always preferred to later writers with one or two exceptions, and published in 1808 his "Specimens of English Dramatic Poets who lived about the Time of Shakespeare," with appreciative and suggestive notes, which was more favorably received than his preceding works. To the "Reflector," a short-lived quarterly magazine edited by Leigh Hunt in 1810, he contributed some of his finest pieces, as the essay "On Garrick and Acting," which contains his character of Lear, the "Essays on Hogarth," and the "Farewell to Tobacco." His celebrity as an author and the circle of his literary friends had greatly increased when the establishment of the "London Magazine" in 1820 occasioned the compositions by which he acquired his most brilliant reputation, the "Essays of Elia," first collected in 1823, to which the "Last Essays of Elia" were added in 1833. In 1825 occurred one of

the principal events of his uneventful life, his retirement from his clerkship, which is described in his essay "The Superannuated Man." His salary had then become £700 a year, and he was allowed a life annuity of £450. Great consideration had uniformly been shown him by his superiors. So highly did he value the independence thus obtained by drudgery, that he advised one of his friends rather to seek five consolatory minutes between the desk and the bed, or even to throw himself "from the steep Tarpeian rock, slapdash, headlong upon iron spikes," than to rely solely upon literary labor for support. His exultation on his release appears in his letters: "I came home for ever on Tuesday in last week. The incomprehensibility of my condition overwhelmed me. It was like passing from life into eternity." Coleridge, Lloyd, Southey, Godwin, Manning, Wordsworth, George Dyer, Hazlitt, Talfourd, Bernard Barton, Leigh Hunt, Cary, Procter, De Quincey, and Hood were among those who shared his intimacy. Many of these were wont to meet at the Wednesday evening parties of Charles and Mary Lamb in his chambers in Inner Temple lane, which would occupy a large space in a literary history of his epoch, and which his biographer elaborately compares with the evenings of Holland house. Lamb presided over the motley group, stammering out puns, witticisms, and fine remarks, while his countenance is described as presenting a sort of quivering sweetness, "deep thought striving with humor, the lines of suffering wreathed into cordial mirth;" and his whole appearance resembled his own characterization of another person, "a compound of the Jew, the gentleman, and the angel." Though many of his curious sayings have been recorded, it is affirmed that they give no idea of the singular traits, the verbal felicities, and happy thoughts of his conversation. His single frailty was the eagerness with which from an early period of life he would quaff exciting liquors, snatching a fearful pleasure "between the acts of his distressful drama." He made a final abandonment of tobacco, though he had learned to smoke the strongest preparations of the weed, saying to Dr. Parr that he had toiled after this power as some men toil after virtue. His large intellectual tolerance, cherishing among his intimate associates men of every variety of philosophical, religious, and political opinions, has rarely been equalled. He delighted especially in individual peculiarities and oddities, and in all striking displays of human nature. During the last six years of his life he resided with his sister successively at Islington, Enfield, and Edmonton, often visiting his old associates in London, heavily afflicted by the deaths of Coleridge and Hazlitt, and with little disposition to write anything but verses and essays that were given to his friends. While taking his daily morning walk he accidentally fell, slightly wounding his face, and erysipelas ensued, which terminated fatally.

In his last moments, when nearly insensible to things around him, his mind seemed intent on hospitable purposes, and he proposed in broken sentences some meeting of his friends. Beneath all his inconsistencies, his fantastic ideas, subtle perceptions, absurd fancies, and mingling of jest with seriousness, the most constant and prominent feature of his character was amiability. The "Essays of Elia" hold a peculiar place in English literature. The style is a model of quaint and graceful elaboration, showing both his original genius and his familiarity with the fine sayings of the Elizabethan age; and they abound as well in profound thoughts as in the rarest fancies and felicities of expression. His works were edited, with a biography consisting largely of his letters, which are among the most delightful in the language, by Thomas Noon Talfourd (1 vol. 8vo, London, 1840; 4 vols., 1850; with addition of the "Final Memorials," 1 vol., 1852; 4 vols., 1855). The "Specimens of English Dramatic Poets," and other writings of his, are not included. The "Essays of Elia" have been published separately (Boston, 1860), and a volume of the uncollected writings of Charles Lamb, edited by J. E. Babson (Boston, 1864), since incorporated with several complete editions. **II. Mary Anne**, an English authoress, sister of the preceding, born in London in 1765, died in St. John's Wood, May 20, 1847. She resided constantly with her brother until his death, except when fits of insanity obliged her removal to the asylum. She wrote a few slight poems, and in conjunction with him the "Tales from Shakespeare" (1807) and a collection of juvenile tales entitled "Mrs. Leicester's School" (1808). The stories by her are, as Charles delighted to insist, the best of the collection. When well, she was remarkable for the sweetness and placidity of her disposition. On Charles Lamb's death the East India company granted to her the pension to which a widow was entitled, and her brother had besides made her comfort secure by his own savings. A volume of poems, letters, and remains of Mary and Charles Lamb, with reminiscences and notes, edited by W. Carew Hazlitt, was published in 1874.

**LAMBALLE, Marie Thérèse Louise de Savoie-Carignan**, princess of, born in Turin, Sept. 8, 1749, murdered at the prison of La Force in Paris, Sept. 3, 1792. She was early remarked for her intelligence, sweetness of temper, and personal beauty. In 1767 she was married to the prince of Lamballe, son of the duke of Bourbon-Penthièvre. This union was not happy, and the princess was about to seek a separation when her husband died, May 7, 1768. On the death of Marie Leszczyńska, a marriage was proposed between her and Louis XV.; but the project was defeated by Choiseul and his adherents. Marie Antoinette conceived a strong attachment for the princess, and on her accession to the throne appointed her superintendent of the royal household. The

princess proved a devoted friend. She saw without jealousy the growing favor of the duchess of Polignac, and silently kept aloof; but when the latter, on the breaking out of the revolution, deserted her mistress, she returned to her post. She was at the queen's side on the dreadful days of June 20 and Aug. 10, 1792, and accompanied her to the legislative assembly and afterward to the Temple. On Aug. 19 she was separated from her mistress and confined in the prison of La Force, where, despite the most energetic measures to save her, she fell a victim to the September massacre. When she appeared before the tribunal which passed sentence upon the prisoners, she answered with firmness and dignity. She refused to take the oath against the king, the queen, and monarchy; and scarcely had the verdict, "Out with her," been uttered, when she was struck down with a billet by a drummer boy and despatched with a sword; her body was mutilated and exposed, and her head placed on a pike, and carried first to the Palais Royal, where the duke of Orleans, her brother-in-law, was forced to salute it, and then to the Temple, where it was paraded under the windows of the queen. The *Mémoires relatifs à la famille royale de France* (2 vols. 8vo, Paris, 1826), gathered from her conversations and memoranda, and published by Mrs. C. Hyde, the marchioness Solari, are not considered authentic. Her biography has been written by M. de Lescure (Paris, 1864).

**LAMBERT, Daniel**, an English giant, born in Leicester, March 13, 1769, died in Stamford, June 21, 1809. Neither his parents, brother, nor sisters were of unusual size, but an uncle and an aunt were remarkable for corpulence. In his youth he excelled in strength, and was fond of field sports and other athletic exercises, but gave no indications that he was to attain excessive bulk till his 19th year. He soon after succeeded his father as keeper of the prison in Leicester, and his rapid increase in size from that time he attributed to his confinement and sedentary life. In 1793, when he weighed 448 lbs., he walked from Woolwich to London with less fatigue than several other men in his party. He was noted as a swimmer, and could float with two men of ordinary size on his back. Being incommoded by the curiosity of numerous visitors from the adjacent country, he decided in 1806 to exhibit himself in London. His apartments in Piccadilly became almost a place of fashionable resort, and his visitors were received with politeness, and treated him in the most respectful manner. He remained five months in the metropolis, and afterward exhibited himself in the principal towns of England. He was 5 ft. 11 in. high, and at his death he weighed 739 lbs. He measured 9 ft. 4 in. round the body, and 3 ft. 1 in. round the leg. He never drank any beverage but water, slept regularly less than eight hours a day, was healthy, active, and vivacious through life, and took part in all the sports of the field till within a few years of his death.

**LAMBERT, Johann Heinrich**, a German philosopher, born in Mülhausen, Alsace, Aug. 29, 1728, died in Berlin, Sept. 25, 1777. He was the son of a poor tailor, and was chiefly self-educated. He was at first a copying clerk, afterward secretary to the editor of a newspaper at Basel. In 1748 he went to Coire in Switzerland, and became private tutor in the family of Count Peter de Salis, then president of the confederation. In 1756-'8 he visited Holland, France, and Italy with his pupils. In 1759 he removed to Augsburg, but, having been appointed to determine the boundaries between the country of the Grisons and the Milanese, he returned to Coire in 1761, and sojourned there till 1763. In 1764 he went to Berlin, and was made a member of the royal academy of sciences; in 1770 he was appointed superior councillor of the board of works; and in 1774 was intrusted with the superintendence of the "Astronomical Almanac." He was regarded as the most analytical writer on scientific subjects of his day. The measurement of the intensity of light was first reduced to a science in his *Photometria* (Augsburg, 1760), and the theory of refraction was developed in *Les propriétés remarquables de la route de la lumière par les airs* (the Hague, 1759; Ger. translation, Berlin, 1773). Among his other works are: *Die freie Perspective* (Zürich, 1759); *Kosmologische Briefe über die Einrichtung des Weltbaues* (Augsburg, 1761); *Insigniores Orbitæ Cometarum Proprietates* (1761); *Neues Organon* (Leipzig, 1764); *Beiträge zum Gebrauch der Mathematik* (Berlin, 1765-'72); and *Anlage zur Architektonik* (Riga, 1771). His correspondence with Kant appears in the minor miscellaneous works of the latter.

**LAMBERT, John**, an English general, born in Kirkby-Malhamdale, in the West riding of Yorkshire, Sept. 7, 1619, died in the island of Guernsey in 1692. He was educated for the bar, but at the outbreak of the civil war entered the parliamentary army as a captain under Fairfax, and at the battle of Worcester, Sept. 3, 1651, was a major general. He was instrumental in procuring the recognition of Cromwell as protector, and was a member of the first parliament called by him. But upon the assumption by Cromwell in 1657 of sovereign power, and his inauguration with the solemnities applicable to monarchs, he refused to take the required oath of allegiance and retired from public life. After the death of Cromwell he associated himself with the general council of officers of the army, and aided in deposing Richard Cromwell, even venturing, on the credit of his military reputation, to aspire to the position of protector. As a leader of the fifth monarchy men and extreme republicans, he was prominent in procuring the return in May, 1659, of the remnant of the long parliament called the "rump;" and upon the rising of the royalists in Chester in August of the same year he promptly marched thither and defeated them. This success excited the

jealousy of parliament, and on a flimsy pretext Lambert with other officers was cashiered; whereupon with a body of soldiers he dispersed the members, Oct. 13, and a committee of safety appointed by the army, of which Lambert was the controlling spirit, began to exercise the functions of government. His position at this time was so important that it was considered not unlikely, in the event of his own schemes of sovereignty proving impracticable, that he might make terms with Charles II.; and some of the adherents of the latter went so far as to recommend him to secure the services of Lambert by marrying his daughter. Meanwhile Monk commenced his march from Scotland for the purpose of restoring parliament. Lambert at the head of 7,000 men started to oppose him; but his troops deserted in great numbers, and in January, 1660, he was seized by order of parliament, which had reassembled during his absence, and committed to the tower. Monk's design to restore the monarchy being now manifest, the hopes of the republicans began again to centre in Lambert, who, escaping from the tower in April, put himself at the head of a body of troops in Warwickshire. His men again deserted him, and he was recaptured by Col. Ingoldsby and conveyed to the tower. Having been excepted from the bill of indemnity after the restoration, he was tried in 1662 in the court of king's bench with Sir Harry Vane, and convicted, but was relieved at the bar and banished to Guernsey, where he devoted the rest of his life to botany and flower painting. He is said to have died a Roman Catholic.

**LAMBESSA**, or **Lambèse**, a French penal colony of Algeria, in the province and 55 m. S. by W. of the city of Constantine, founded in 1848-'50; pop. of the town about 400, of whom half are Europeans. A French commander resides in the place, and is supported by a body of officers and soldiers. Lambessa contains a church, a hospital, a post office, and various other public buildings, the principal of which is the prison, built at a cost of \$350,000. The prisoners are permitted to work at their former trades; half of the proceeds of their labor is given to them at once, and the remainder when they are set free. The neighboring country is well adapted for agriculture and fruit growing, but is not yet much cultivated.—Lambessa occupies the site of the ancient Lambese or Lambæsa, which was one of the most important cities in the interior of Numidia, belonging to the Massylii. Under the Romans an entire legion was stationed here, and among its interesting ruins are the remains of an amphitheatre, a temple of Æsculapius, a triumphal arch, and other buildings, enclosed by a wall in which 40 gates have been traced, 15 of them still in a good state of preservation. Statues of Jupiter, Æsculapius, and Hygiea, and busts of Roman emperors and empresses have been found, besides a number of tombs and inscriptions. The

population could not have been much less than 50,000. A synod was held there in A. D. 240, attended by 100 prelates. The city was destroyed by the Vandals in the 5th century, and its site was lost; it was discovered in 1844 by the French commandant Delamarre.

**LAMBETH**, a parish and suburb of London,  $1\frac{1}{2}$  m. S. W. of St. Paul's cathedral, on the S. side of the Thames, here crossed by the Waterloo, Charing Cross railway, Westminster, and Vauxhall bridges; pop. in 1871, 379,112. Lambeth palace, the town residence of the archbishop of Canterbury, is situated between Vauxhall and Westminster bridges, opposite the new houses of parliament. This property was acquired by the see in 1197, and has been improved by successive incumbents. The palace stands on a low site close to the river, surrounded by gardens 12 acres in extent. Its objects of interest are the Lollards' tower, founded about 1440; the banqueting hall;

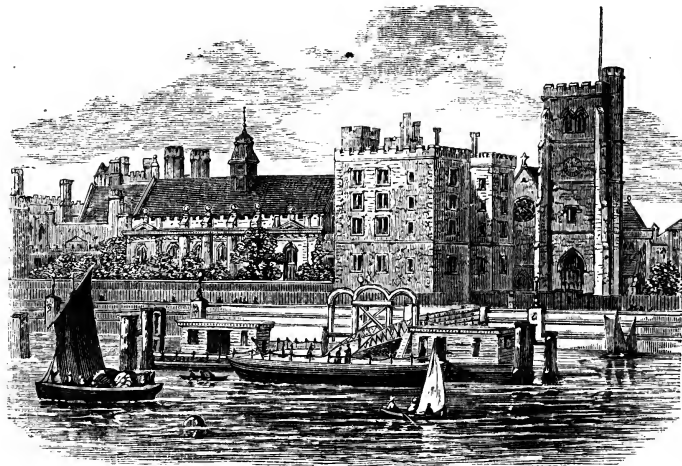
**LAMBRUSCHINI, Luigi**, an Italian prelate, born in Genoa, May 16, 1776, died in Rome, May 12, 1854. He entered in youth the order of Barnabites, and became successively bishop of Sabina, archbishop of Genoa, papal nuncio to France, and in 1831 cardinal. Gregory XVI. appointed him secretary of state for foreign affairs, librarian of the Vatican, grand prior of the order of Malta, and minister of public instruction. On the death of Gregory in 1846, he received on the first ballot for the successor the largest number of votes. Under Pius IX. he became member of the state council, bishop of Porto, and chancellor of the pontifical orders. On the outbreak of the political commotions he fled to Civit  Vecchia, subsequently returned to Rome, fled again in November, 1848, to Naples, and soon after joined the pope at Ga ta. He returned with him to Rome in 1850, and counselled, it is said, milder measures than those adopted by Cardinal Antonelli. He wrote some devotional works and a polemical dissertation on the immaculate conception, all translated and published in France.

**LAMTON**, a S. W. county of Ontario, Canada, bounded N. by Lake Huron and W. by the St. Clair river, and drained by the Sydenham river and other streams; area, 1,083 sq. m.; pop. in 1871, 38,897, of whom 12,673 were of Irish, 11,538 of English, 9,800 of Scotch, and 1,624 of German origin or descent. It contains extensive petroleum wells, and is

traversed by the Grand Trunk and Great Western railways. Capital, Sarnia.

**LAMEGO**, a town of Portugal, in the province of Beira, 71 m. E. N. E. of Coimbra, at the foot of the Sierra Penude, and 3 m. S. of the Douro; pop. about 9,000. It is surrounded by walls, defended by an old castle, and has a fine cathedral, but is otherwise uninteresting and excessively dirty. It contains an episcopal palace, a college, a diocesan seminary, three monasteries, two hospitals, and a nunnery. It has been the seat of a bishop since the 4th century. Its chief celebrity is due to the story that a cortes was held here in 1143, at which the constitution of the newly created kingdom of Portugal was drawn up; but this is now said to be fictitious. Lamego was the residence of the Moorish kings till it was taken from them by Ferdinand the Great in 1038.

**LAMELLIBRANCHIATES**, a name properly given to the acephalous mollusks, having the gills



Lambeth Palace.

the chapel, with a fine roof of carved oak; and the library. Among its many literary treasures and curiosities is a superb Arabic Koran, presented by the governor general of India through Claudius Buchanan in 1805, who calls it "the most valuable Koran of Asia." The library also contains the archiepiscopal registers of the see of Canterbury in regular succession from the year 1278, and the parliamentary surveys of ecclesiastical benefices in the time of the commonwealth, now used as legal evidence. The parish contains many churches, charitable institutions, and other public buildings, some of them elegant and ornamental. Near Vauxhall bridge is the terminus of the Southampton railway. There are many manufactories, and several places of amusement, among them Astley's amphitheatre. In September, 1867, a pan-Anglican synod was held in Lambeth palace, in which several American Protestant Episcopal bishops participated.

in lamellæ on the sides, protected by a right and left shell. Excluding the mollusoids (brachiopods, tunicates, and bryozoans), now believed by many to be articulates, coming near the worms, the term would be synonymous with the bivalve mollusks.

**LAMENNAIS, Hugues Félicité Robert de**, a French author, born in St. Malo, June 19, 1782, died in Paris, Feb. 27, 1854. His father, a wealthy ship owner engaged in commerce, had been ennobled by Louis XVI. He was early abandoned to himself in consequence of the death of his mother and the pecuniary difficulties of his father. He lived almost in solitude, sometimes obtaining assistance in his studies from his elder brother Jean, till about his 12th year, when he was intrusted to the care of his uncle, who confined him day after day in his library. He read Plutarch and Livy, admired Rousseau, and disputed with the parish priest about religion. In his 16th year he retired with his brother to La Chênaie, a residence two leagues from Dinan, where he reduced his studies and various reading to order, mastered Latin, Greek, Hebrew, and several modern languages, and acquainted himself with the church fathers, doctors, historians, and controversialists. He was 22 years old before he made his first communion, and he adopted the ecclesiastical profession only after long hesitation. He made a translation of an ascetic work by Louis de Blois (published in 1809), and published in 1808 *Réflexions sur l'état de l'Église*, his first protest against the reigning philosophical materialism, which was immediately seized and destroyed by the imperial police. He engaged with his brother on the *Tradition de l'Église sur l'institution des évêques* (3 vols., Paris, 1814), in which he confuted the Gallican tenet that the election of bishops is valid without the sanction of the holy see. After being teacher of mathematics in the seminary of St. Malo, founded by his brother, he went in 1814 to Paris, where he lived modestly and unknown. On the return of the Bourbons he published a violent attack upon Napoleon. Judging it prudent to leave France during the hundred days, he took refuge in the island of Guernsey, where he passed several months under the name of Patrick Robertson. He engaged in teaching in London, and for several years after 1815 in Paris. In 1816, at the age of 34, he received sacerdotal ordination, having received the tonsure in 1811; and in 1817 he published the first volume of his *Essai sur l'indifférence en matière de religion*. This was the fruit of constant labor during many years of trial and obscurity, and had an immediate effect throughout Europe. It aimed to oppose to Protestantism and philosophy the principle of ecclesiastical authority and the absolutism of faith. It was received by Catholics with admiration and enthusiasm, and the author became a principal collaborator in the *Conservateur*, a journal founded by Chateaubriand, Villèle, De Bonald, Frayssinous, and others, which was chief-

ly directed against the ministry of Decazes. Though thus ranged among the defenders of the monarchy, he was more earnestly a Catholic than a royalist, and sought in the maintenance of the throne to secure guarantees for the stability of the church. The political hopes cherished concerning him were thus disappointed, and in 1820 he separated from his party with a portion of his colleagues called the "incorruptibles," and vehemently assailed the ministry of Villèle in the *Drapeau Blanc*, and afterward in the monthly *Mémorial Catholique*. The first volume of his *Essai* was suspected of innovating tendencies before the appearance of the second (1820), in which he rejected the Cartesian system, which gives authority to the individual reason, and developed a new theory of intellectual authority founded on the universal agreement of mankind. He maintained that there is a preëstablished harmony between the doctrines of the church and the ideas of the race, that truth is attainable not only from revelation but from universal tradition, and thus sought to make the general consent of men the basis of an alliance between reason and faith. In the last two volumes (1824) he traced the transmission of truth through the ages, collected the scattered traditions of various peoples, and sought to demonstrate that Christianity alone possesses the double character of universality and perpetuity. This work was unanimously and strongly opposed by the Sorbonne and the prelates, and was applauded only by a small body of disciples. He wrote a short defence, and in 1824 went to Rome to present it to the pope. He was coldly received by the cardinals, and Leo XII., who had at one time thought of creating him a cardinal, after conversing with him, declared to his assistants that Lamennais would cause much trouble in the church. On his return, after publishing a translation of the "Imitation of Christ," he produced *De la religion considérée dans ses rapports avec l'ordre civil et catholique* (2 vols., Paris, 1825-'6), in which he strove to establish the absolute spiritual supremacy of the holy see as the solution of the social problem. For this publication he was arraigned before the civil tribunal, and condemned. From this time war was waged between Lamennais and the bishops of France. In his treatise *Des progrès de la révolution et de la guerre contre l'Église* (1829) he first indicated his tendency toward political liberty while laying stress on theocratic absolutism. To combine democracy with the papal supremacy, liberal with Catholic ideas, became his avowed aim immediately after the revolution of 1830. He founded the journal *L'Avenir*, having the motto *Dieu et liberté—le pape et le peuple*, and was assisted by a corps of young and ardent disciples, among whom were Gerbet, De Salinis, Lacordaire, Rohrbacher, De Coux, and Montalembert. It demanded administrative decentralization, extension of the electoral right, freedom of worship, uni-



versal and equal freedom of conscience, freedom of instruction, and the liberty of the press. Encouraged by a portion of the people and of the lower clergy, it was violently opposed by most of the prelates and Jesuits, who denounced it at Rome. While the contest was going on, the editors decided (Nov. 15, 1831) to suspend it for a time, and three of them, Lamennais, Lacordaire, and Montalembert, repaired to Rome to seek the papal approbation. No notice was taken of them on their arrival; Lamennais in vain sought a conference with the pope on the subject of his mission, and after waiting several months decided to return to France. He had gone as far as Munich when he received the encyclical letter, dated Aug. 15, 1832, in which Gregory XVI. formally condemned the doctrines of *L'Avenir*. His principal collaborators yielded at once to the decision; he himself announced that the journal would not again appear. A dogmatic submission was demanded from him, which he finally signed, reserving to himself full liberty in regard to whatever he should believe for the interest of his country and of humanity. He then retired to his patrimonial villa of La Chênaie, and composed, it is said within a week, his *Paroles d'un croyant*, which was not published till 1834, after a year of meditation. From its appearance dates his final and definite rupture with the Roman Catholic church. It was immediately translated into the different European languages, passed through more than 100 editions in a few years, and received the papal condemnation as a book "small in size, but immense in its perversity." In 1836 he published his *Affaires de Rome*, in which he seems to cast a last melancholy look upon the belief which he had abandoned. In the following year he began a journal, *Le Monde*, in the interest of extreme democracy, which survived but a few months. He subsequently produced various political pamphlets, one of which, *Le pays et le gouvernement* (1840), caused his imprisonment for a year in Ste. Pélagie, where he was daily visited by numerous friends. As one of the chiefs and the ablest writer of the republican party, he took part in the revolution of 1848, and after editing the *Peuple Constituant*, a daily newspaper, for four months, was elected by an unusually large vote one of the representatives of Paris in the constituent assembly. He projected a constitution in accordance with his own theories, which was rejected by the committee as too radical. For three years he protested by his silent vote against the course of events. After the *coup d'état* of Dec. 2, 1851, he retired from public life, and was occupied in his last years with translating Dante. At the news of his dangerous illness, priests, and even ladies of the highest rank, sought admission to his chamber to induce him to be reconciled to the church; but by his express prohibition no one was received except those connected with his family. His obsequies were performed amid

an immense concourse of people, and in accordance with a direction in his will his body was borne directly to the cemetery without being taken to any church; and no cross, nor even a stone, marks his grave. He was both one of the ablest defenders and one of the ablest opponents of the papacy in the present century. The constant element in his speculations was an ideal of democracy, which he sought to realize in the first part of his career by allying the people and the pope against the civil monarchy, and in the second part by exalting the people to supremacy in defiance alike of the pope and the civil monarchy. He initiated and gave life to the ultramontane movement, which, after being the object of his most ardent devotion, prevailed in the church of France in spite of his efforts and with his maledictions. Besides the works already mentioned, he published *Esquisse d'une philosophie* (4 vols., 1840-'46). Its system is akin to Neoplatonism, and it traces the rise of all the arts to the plan of the Christian temple. His complete works have been twice collected (12 vols., 1836-'7, and 11 vols., 1844 *et seq.*). Several volumes of posthumous works, including *Correspondance*, were published under the care of Émile Forgues (1856 *et seq.*).

**LA METTRIE, Julien Offray de**, a French physician and philosopher, born in St. Malo, Dec. 25, 1709, died in Berlin, Nov. 11, 1751. He was the son of a rich merchant, received a liberal education, and was destined for the church, but preferred to devote himself to medicine. In 1733 he went to Leyden, where he placed himself under the direction of Boerhaave, several of whose works he translated into French. In 1742 he went to Paris, and was appointed physician to the *gardes françaises*, followed that regiment into Germany, and witnessed the battles of Dettingen and Fontenoy. In 1745 he published his *Histoire naturelle de l'âme*, in which he denied the immateriality of the human soul. In consequence of this he lost his office, and the following year, having issued his *Politique du médecin de Machiavel, ou le Chemin de la fortune ouvert aux médecins*, a libellous attack upon his medical colleagues, he was obliged to fly to Holland. There he wrote and printed his noted atheistical work, *L'Homme-machine* (12mo, Leyden, 1748), which was publicly burned by order of the authorities. Expelled from Holland, he was invited to Berlin by Frederick the Great, who made him his reader and a member of his academy. He lived on terms of familiarity with the king, and published several works of a similar tendency to his previous writings; among them were *L'Homme-plante* (Potsdam, 1748), *Réflexions sur l'origine des animaux* (Berlin, 1750), and *Vénus métaphysique, ou Essai sur l'origine de l'âme humaine* (Berlin, 1752). He died of indigestion, caused by high living. Frederick wrote his eulogy. Several editions of his philosophical works have been published; the most complete in Berlin, 1796.

**LAMMAS DAY**, in the calendar, the first day of August, so called perhaps from the custom which formerly prevailed among the tenants who held lands of the cathedral church in York, England, of bringing a live lamb into the church at high mass on that day. Some antiquaries derive the term from a Saxon word signifying loaf mass or bread mass, which was a feast of thanksgiving to God for the first fruits of the harvest. It is said to have been even recently a custom for tenants to bring in new wheat to their lord on or before that day. In the Salisbury manuals of the 15th century it is called *benedictio novorum fructuum*, and on this day before the reformation Peter's pence were paid in England. Dr. Johnson thinks it is a corruption of "latter math," meaning a second mowing of the grass. Valancey, in his *Collectanea de Rebus Hibernicis*, mentions that the 1st of August, Laithmas (pronounced La-ee-mas), was celebrated by the druids as the day of the oblation of grain. The proverb "at latter Lammas" is a euphemism for "never."

**LAMMERGEYER** (Germ. *Lämmer*, lambs, and *Geier*, vulture), or **BEARDED VULTURE** (*Gypæ-*

of the head, the neck, and the under parts are whitish tinged with orange, deepest on the breast; the wings and tail are grayish black, the wing coverts dashed with orange white; the back deep brown; the beard and space including the eye and cere black; bill horn-colored. There is only one well characterized species, which inhabits the mountains of Europe, Asia, and northern Africa, especially the Alps and Pyrenees. Lammergeyers are seen usually in pairs; they feed on lambs, goats, chamois, &c., which they attack in such a manner as to cause them to leap over precipices, when they descend and devour the mangled carcasses; they also eat carrion. The nest is made upon inaccessible rocks, rarely upon lofty trees, several feet in diameter and of coarse materials, and the number of eggs is two or three. This bird plays the same part in the old world as the condor does in the new, and is very destructive to the flocks of the Alpine valleys; stories are numerous, though not well authenticated, of its having carried off children. It is not abundant anywhere, and is rarely seen in Europe north of Germany. The African bird (*G. meridionalis*, Brehm) and the Asiatic (*G. Himalayanus*, Hutt.) are probably only varieties of the bearded vulture.

**LAMOILLE**, a N. county of Vermont, drained by Lamoille river; area, 420 sq. m.; pop. in 1870, 12,448. The surface is hilly, the Green mountains traversing the county in a N. E. and S. W. direction. There is some excellent soil in the valleys, but the land is chiefly adapted to grazing. The chief productions in 1870 were 18,257 bushels of wheat, 61,836 of Indian corn, 168,103 of oats, 333,185 of potatoes, 50,022 lbs. of wool, 68,233 of hops, 657,892 of maple sugar, 984,378 of butter, 39,199 of cheese, and 41,570 tons of hay. There were 2,703 horses, 8,886 milch cows, 1,375 working oxen, 4,701 other cattle, 9,377 sheep, and 2,480 swine; 8 manufactories of carriages, 1 of hones and whetstones, 1 of paper boxes, 10 of starch, 3 of tin, copper, and sheet-iron ware, 1 of woollen goods, 2 tanneries, and 9 saw mills. Capital, Hyde Park.

**LAMORICIÈRE**, Christophe Louis Léon Juchault de, a French general, born in Nantes, Feb. 6, 1806, died near Amiens, Sept. 10, 1865. He was educated at the polytechnic school of Paris, and at the academy for military engineers of Metz, on leaving which he joined the Algerian army and entered the corps of Zouaves at the time of its formation (November, 1830). He was placed in 1833 at the head of the office (*bureau arabe*) organized by Gen. Avizard for facilitating the relations with the native population. He took an active part in the capture of Constantine. In 1839 he was recalled to Paris, but returned in 1840, and gained distinction at Mouzaïa, in the Mascara expedition, and at Isly. The celebrity of the Zouaves was chiefly due to him. In November, 1845, on the departure of Gen. Bugeaud, he became provisional governor general of Al-



Lammergeyer (*Gypætus barbatus*).

*tus barbatus*, Cuv.), the largest of European birds of prey. It is about 4 ft. long and 9 or 10 ft. in extent of wings; the head and neck are completely clothed with feathers, and the cere is entirely hidden by projecting bristles; the bill is long and strong, straight, laterally compressed, with the tip curved and sharp; a tuft of stiff bristles projects forward like a beard from the base of the lower mandible; the wings are long, the second and third quills nearly equal and longest; tail lengthened and wedge-shaped; tarsi short and covered with feathers; toes moderate, the anterior ones united at the base by a membrane; claws curved, especially those of the inner and hind toes, and not well adapted for seizing and destroying prey. In the adult, the upper part

geria, but went to France in 1846, in the hope of exerting a favorable influence upon the destiny of the African colony by taking part in the parliamentary discussions on the subject. He was elected to the chamber in October, 1846. Returning to Algeria soon after, he organized the expedition against Abd-el-Kader which finished the war. He made altogether 18 African campaigns, and rose to the rank of lieutenant general. He was reelected to the chamber of deputies in 1847, and when the revolution of February, 1848, broke out, he exerted himself in favor of the formation of a new administration under Louis Philippe, and as colonel of the national guard went among the people assembled on the boulevards to allay the public excitement. But he was not listened to, and after the abdication of Louis Philippe he was slightly wounded while on his way to the Palais Royal to proclaim the regency of the duchess of Orleans. On the same evening he tendered his allegiance to the provisional government. He took his seat in the constituent assembly as a member for Sarthe, and became prominent in the committee on military affairs. During the bloody days of June, 1848, three horses were killed under him. He officiated as Gen. Cavaignac's minister of war until December, 1848, and was instrumental in introducing various measures for the benefit of Algeria. He strenuously opposed the election of Louis Napoleon to the presidency, and even questioned his right to citizenship. Being elected to the legislative assembly, he became president of the constitutional committee, and opposed the projects of the ultra-radical party. In the course of the Hungarian struggle with Austria, he was intrusted with a diplomatic mission to Russia; but on his arrival there the Hungarians had already been crushed by the armed interference of the czar. On hearing of the overthrow of Odilon Barrot's administration (Oct. 31, 1849), he returned to France and resumed his seat in the legislative assembly. After the *coup d'état* of Dec. 2, 1851, he was arrested and detained in the fortress of Ham until Jan. 9, 1852, when he was permitted to go to Prussia. A letter of his, refusing to recognize the government of Louis Napoleon, was published in May, 1852. He afterward resided in Germany, Belgium, and England. In 1857, on the sudden death of one of his children, he was allowed to return to France; and with the consent of the French government in April, 1860, he was appointed by Pope Pius IX. commander-in-chief of the papal troops, mainly foreigners. The Sardinian government, completing the work begun by Garibaldi in the Neapolitan provinces, sent Gens. Cialdini and Fanti into Roman territory; they took Perugia, annihilated Lamoricière's army at Castel Fidardo, Sept. 18, besieged him in Ancona, and compelled a capitulation, Sept. 29. He published an extended report of his last campaign.

**LA MOTTE-FOUQUÉ.** See **FOUQUÉ.**

**LAMOTTE-VALOIS, Jeanne de Luz de St. Remy,** countess de, a French adventuress, born in Champagne about 1756, died in London, Aug. 23, 1791. After marrying a count de Lamotte, who was a spendthrift, she went to Paris, and succeeded in being introduced to Marie Antoinette, who took some interest in her, and to Cardinal de Rohan, grand almoner to the king. She persuaded the latter that she could conciliate for him the affection of the queen, who she told him was desirous of getting a magnificent diamond necklace, then in the hands of the court jewellers, which was worth about 1,600,000 francs. She induced a Mlle. d'Oliva who resembled Marie Antoinette, to personate her at a midnight interview with Rohan in the gardens of Versailles. With the real signature of Rohan and a forged one of the queen, the countess got possession of the necklace (Feb. 2, 1786), which she sold in London, but pretended that she had delivered it to the queen, and for several months concealed the robbery by producing forged notes apparently written by the latter. Finally a direct application of the jewellers to her majesty awoke suspicion, which resulted in a public trial before the parliament. All France was excited over the affair. The cardinal was discharged from all accusation, while the countess was sentenced to be whipped, branded on the shoulder, and imprisoned for life. After being incarcerated about two years at the Salpêtrière, she escaped, June 5, 1787, and fled to London, where she published libels against the queen. Her husband survived her, and twice wrote a complete history of the affair; the first manuscript was taken from him by the French police; the second was mutilated in its most important parts. This mutilated manuscript was printed in 1858, under the supervision of L. Lacour, with the title *Affaire du collier: Mémoires inédits du comte de Lamotte-Valois*. The best account of the affair is to be found in Louis Blanc's *Histoire de la révolution française*.

**LAMOURE,** an E. central county of Dakota territory, recently formed and not included in the census of 1870; area, about 1,800 sq. m. It is intersected by the Dakota or James river.

**LAMP,** a vessel employed for producing light, and sometimes also heat, by the combustion of inflammable fluids, grease, or wax. The simple form of these contrivances adopted by the ancient Hebrews has continued in use down to the present day; and until near the close of the last century this had hardly been improved upon among the most civilized nations. Even on the American continent may still be seen among the Canadian French the same low oval metallic vessel that was used by the ancient orientals and Europeans, furnished with a handle at one end and a beak at the other, through a hole on the upper surface of which projects the wick from the reservoir of oil or grease below. Some are made to be carried in the hand and placed upon tables, and others are kept suspended by chains in the middle of

rooms. They give a dim smoky light, in consequence of the carbonaceous matter not being sufficiently spread by an open wick to be reached by the oxygen of the air before it is dissipated in sooty vapor. (See COMBUSTION, and FLAME.) The external form of the lamp was more of a study to the ancients than the principles of combustion. They gave to it the most graceful outlines, and ornamented it with grotesque figures and fanciful designs which were often of great beauty. They suspended their lamps from the ceiling or from the hands of ornamental figures of boys or men, or they were placed upon stands. As at the present day in Aleppo and Egypt, they were kept by the Hebrews burning all night; and to this much importance was attached, the putting out of the light being significant of the extinction of the family and desertion of the house.—The first improvement in the construction of lamps was removing the beak by a long neck to a distance from the reservoir of oil, thus reducing the width of the shadow cast by the lamp. Besides this object, it was soon found by those who investigated the matter, that the following were subjects for improvement: 1, the wick, which as used presented a bundle of fibres, the inner portion of which, though saturated with oil, was removed from the reach of the air required for its combustion; 2, the level of the surface of the oil, that from first to last it should bear the same relation to the level of the burning part of the wick, thus securing uniformity in the supply of oil for combustion; and 3, the concentration of the light by reflectors at points where it is wanted. The wick was first improved and much used in the countries bordering on the Rhine by plating its fibres together to make it flat and ribbonlike; a flat socket was provided for it, and it was made to move up and down by a horizontal spindle and toothed wheel; this is known as the Worms lamp. A greater improvement was that of the Argand burner, in which the wick was made in the form of a hollow cylinder, and so arranged that a current of air could pass up within it, as well as come to its external surface. The addition of a chimney of sheet iron, as originally made by Argand, increased the supply of air by producing an upward draught. The effect of the chimney was afterward much increased by contracting its upper portion and forming a shoulder, against which the ascending current impinges, and is turned inward upon the flame. The so-called astral lamps were provided with these wicks, and the reservoir for the oil was arranged in the form of a hollow ring encircling the hollow central stand that supported the burner, and with which it was connected by one of the tubular braces that held it up. Thus the level of the oil in the shallow ring could not undergo much change, and it continued very nearly the same as that of the burning part of the wick until it was almost exhausted. In consequence of the thin and peculiar shape

given to the ring, the lamp cast no shadow at a little distance off, and a vase of ground glass surrounding the flame served to render the light still more diffusive or scattered. In the year 1800 Carcel devised an ingenious piece of clockwork machinery for pumping the oil from a reservoir at the foot of the lamp up to the burner, and thus supplying this always from the same point, while the excess of oil flowed back into the reservoir. This being at the base of the stand and the flame at the top, there was consequently no shadow. The lamp, afterward slightly improved by other manufacturers, was in many respects the most perfect of these contrivances; but its great cost restricted its use to the wealthy. It was moreover so inconveniently large and heavy, that it could be moved only with difficulty; and the complicated nature of its mechanism required access to skilful workmen, such as can be found only in large cities, to keep it in repair. The attention directed in the early part of the present century to the subject of producing artificial light by convenient and efficient methods caused many more forms of lamps to be introduced than can here be named. Some were designed to burn the crude whale oil, which on account of its viscosity requires to be heated before it can pass along the fibres of the wick. Parker's hot oil or economic lamp was especially adapted for its use. The reservoir was a double cylinder of metal surrounding the upper portion of the chimney, which was also of metal, the lower part being of glass. It was supported by a side arm, which was made hollow to convey the oil to the burner below. A paper shade served to conceal the apparatus above the flame, and also to reflect the light downward. This lamp is very highly commended by Dr. Ure for its illuminating power and economy. The lamps of Benkler, constructed in Wiesbaden in 1840, introduced a peculiar contrivance in the form of the burner, which caused the draught of air to impinge at an angle upon the flame, making the combustion more vivid and the light more brilliant. It rendered practicable the use of poor qualities of oil, such as in other lamps were very imperfectly consumed, and only with the production of much smoke and disagreeable smell. The so-called solar lamps, first made by Mr. Smith in Birmingham, depended on this principle; and it was essential to the excellent solar lamps made by Cornelius of Philadelphia, which, by means of a metallic cylinder passing from the burner down into the reservoir, permitted the use of lard instead of oil, sufficient heat being conveyed from the flame to keep it in a melted state. The solar lamps, on account of the cheap materials they consume, have been very extensively used; but they require particular care to keep them clean. The wick must be frequently changed, and always freshly trimmed with every using; and the reservoir also must be freshly filled at the same time. A re-

port of comparative experiments made in 1844 for the United States treasury department with the solar lard lamp, an Argand burner for rosin gas, and an Argand oil lamp such as was used in the lighthouses, by Prof. Walter R. Johnson and others, is contained in "Senate Document No. 166," 28th congress, second session. The results are also given in the American edition of Knapp's "Chemical Technology" (1848), vol. i., p. 212. The results of the comparative trials referred to were, that from the same weights of the materials employed the quantity of light afforded by lard was represented by the figures 1068; by rosin gas, of specific gravity 0.8093, "or 43 per cent. superior in density to coal gas," by 956; and by sperm oil (two thirds summer and one third winter strained) by 711.—The forms of lamps so far noticed are not adapted for being carried about in the hand, and their advantageous qualities depend on their being employed for several persons together. Little progress has been made in the production of economical, safe, and convenient small lamps. The vapor lamps, made for burning the vapors arising from a mixture of oil of turpentine and alcohol, which is kept sufficiently heated by a metallic tube passing down into the mixture from the flame, promised to meet this want; but they proved expensive in use, and not altogether free from danger and the offensive smoke and smell of burning turpentine. Similar lamps were made for burning the volatile hydrocarbons obtained from the products of the distillation of bituminous coals. To these succeeded a variety of lamps for the burning of camphene, and of a mixture of camphene and alcohol called burning fluid, but which, together with the material, have passed out of use, as being unsafe. The oils obtained by distillation of bituminous coals and petroleum have introduced new forms of lamps called kerosene lamps, and it is believed that these present all the advantages of cheapness, portability, and brilliancy of light that distinguished the camphene lamps, while their entire safety gives to them a preference which has caused the use of the latter to be wholly abandoned. A multitude of burners have been contrived for these lamps, all made with reference to effecting the most thorough combustion of the oil. One of these in very general use has a flat wick half an inch to two inches broad, which is moved up and down by a horizontal spindle. The wick tube is held by a cap which screws upon the top of the lamp, and over the cap is fitted tightly a brass ring or cylindrical piece perforated all around with holes to let in air to the wick; and this ring carries a dome-shaped cover of thin brass in the top of which is a slit or elongated opening a little larger than the wick and directly over it, through which the flame passes up. The dome being of smaller diameter than the ring, there is room outside of it for the base of a glass chimney to stand, and this is more over

supported outside by the extension upward of the brass cylinder. Another row of holes perforated at the base of this extension lets in air, which passes under the foot of the glass, and circulates up the outside of the dome, meeting the flame at the top. The dome with its opening is somewhat like the peculiar arrangement in the solar lamp. The chimney is enlarged immediately above the flame, and is then contracted to the same diameter as below. The student lamp, used for burning kerosene, has a construction similar to the Argand lamp, and is supplied with a reservoir which keeps the wick full at nearly a constant level.—Lamps in chemical operations answer the purpose of small furnaces. They are made in a great variety of forms, adapted to special uses and the kinds of fuel employed. Some are oil lamps designed for the use of the blowpipe, and are furnished with a broad flat wick convenient for this purpose. Others are designed to consume alcohol; and these are either plain vessels, commonly of glass, furnished with a metallic tube for holding the wick and a closely fitting bell-shaped cover of glass for protecting the alcohol from evaporation when the lamp is not in use; or they are more elaborately constructed of metal, provided with an Argand burner, and made to slide upon an upright rod. This rod also supports movable rings adapted for holding crucibles and other vessels over the flame of the lamp. The heat is concentrated by the use of a metallic chimney; and in some lamps it can be intensified by propelling a current of air of annular form and concentric with the Argand burner, so directed as to impinge across the flame.—*Safety Lamps.* The explosive mixture of light carburetted hydrogen and atmospheric air which is often present in coal mines long made it desirable to procure some kind of device by which the ignition of the compound might be avoided. Contrivances called steel mills were first used to give light in dangerous parts of the mines, a succession of sparks being constantly elicited by the rapid revolution of little wheels of steel against pieces of flint. In an explosive mixture of gas and air these however were not safe, as the sparks were liable to produce explosion. Their greatly increased brilliancy in this served to indicate danger; and where the gas predominated above the explosive proportion the sparks were of blood-red color or ceased entirely to be emitted. The necessity of more efficient protection led to the invention in 1813, by Dr. W. R. Clanny of Sunderland, England, of the first true safety lamp. In this the communication with the external air was intercepted by water, through which the air was made to pass. This apparatus proved too cumbersome for general use. In 1815 George Stephenson and Sir Humphry Davy both invented safety lamps on other principles. The former, noticing the effect of the gaseous products of combustion to extinguish the burning jets of inflammable gas called blowers, which issue from the crevices of coal



mines, contrived a lamp which was protected by a glass cylinder, and covered at top with a perforated metallic cap to allow the products of combustion to pass out. The air to support combustion was admitted through small openings in the bottom, and it was supposed that the velocity of the current entering the lamp would prevent the explosion passing backward; but the protection the lamp afforded was really owing to the smallness of the apertures, continued through capillary tubes till they discharged all around and close against the circular burner. Davy's lamp is represented in fig. 1. The wire-gauze cylinder, through which the air was admitted, served also for the passage of the light, and when composed of wire  $\frac{1}{60}$  to  $\frac{1}{40}$  of an inch in diameter, and with 28 wires or 784 apertures to the inch, proved a perfect obstruction to the flame in the most explosive mixtures, unless these were blown in currents through the gauze, or the lamp was carried rapidly through the gas. The wires might even be heated red hot, as sometimes happens in very foul air, by the flame leaving the wick and burning in the upper part of the cylinder, and no explosion take place; but if a glass cover became hot it might be broken by drops of water falling upon it; and so fragile a material under any circumstances could not be regarded as a sure protection. Among the various modifications of the Davy lamp, that

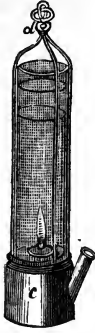


FIG. 1.—Davy's Safety Lamp.

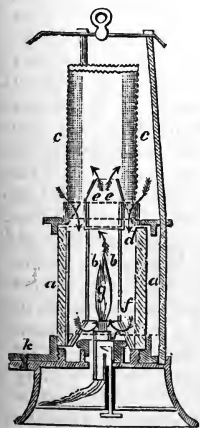


FIG. 2.—Mackworth's Safety Lamp.

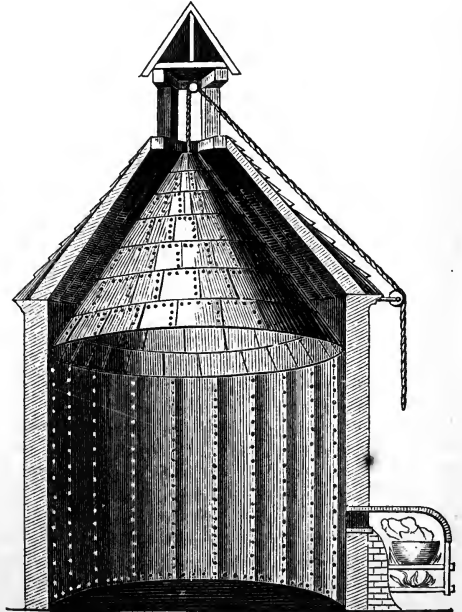
known as Mackworth's safety lamp, which was contrived by one of the government inspectors of coal mines to meet the objections raised in resisting the general introduction of the Davy lamp into the fire-damp mines, is represented in fig. 2. The objections were the small light given by the Davy, which is an inconvenience in working high seams of coal; that its locks could be easily picked and opened by the workmen to obtain more light, or to light their pipes; and also the danger of breaking the glass

already mentioned. The lamp has a thick outer glass, *a a*, and a thin inner chimney, *f b*. The air supplies the flame in the direction of the arrows through three wire gauzes: first the cylindrical gauze *c*; then through the gauze *d*, which supports the brass cover *e* of the glass chimney *b*; and thirdly

through the conical wire gauze *f*, which with its frame acts as a support to the glass chimney *b*. This conical frame throws the air on to the flame *g* so as to produce a more perfect combustion and a white light. This lamp burns with a steady flame in currents of air which extinguish other lamps. It is  $1\frac{1}{2}$  lb. heavier than the Davy, and  $1\frac{1}{2}$  lb. lighter than the Clanny lamp. The outside glass does not get so hot as in the latter, and if it breaks, there is still a perfect safety lamp inside.

**LAMPASAS**, a central county of Texas, bounded W. by the Colorado river and drained by the Lampasas, a tributary of the Leon; area, 835 sq. m.; pop. in 1870, 1,344, of whom 86 were colored. The surface is much broken, and the soil is fertile; much of the land is well adapted to grazing. There are white sulphur springs at the county seat. The chief productions in 1870 were 45,487 bushels of Indian corn and 26 bales of cotton. There were 713 horses, 20,787 cattle, 1,241 sheep, and 4,320 swine. Capital, Lampasas.

**LAMPBLACK**, finely divided carbon, obtained by collecting the smoke produced in burning oils, fats, and resins, with a supply of air sufficiently reduced to prevent perfect combustion; the aim being to consume all the constituents



Lampblack Apparatus

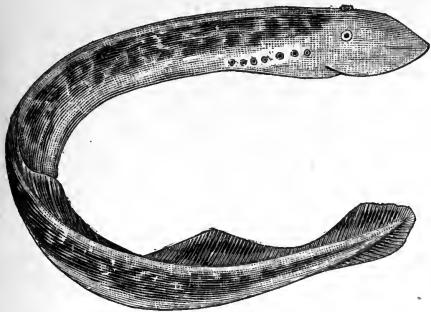
of the burning body except the carbon, and preserve as much of that as possible. Lampblack is prepared in large quantities by the manufacturers of turpentine, from the impure resin and other refuse matters that remain after the distillation of the turpentine. These

are burned in iron pots or furnaces with very limited access of air. The dense smoke produced by the combustion is conveyed into chambers hung with sacking, upon the surface of which the lampblack is deposited. It is scraped or shaken off from time to time, and sent to market without further preparation. The illustration shows the arrangement of the apparatus generally used. A cylindrical brick chamber 10 or 15 ft. in diameter, with a conical roof, has a small opening at the top to maintain a sufficient draught to cause the clouds of smoke to ascend toward the upper part of the chamber. A cone of sheet iron hangs within the cylinder, having a small hole in its apex, through which the gases pass upward. At the side and base of the chamber is a kind of furnace, above the fire in which is placed a pan containing resinous or fatty matters, which are heated to a point sufficient to convert them into vapor, and then the vapor undergoes sufficient combustion to be deprived of its hydrogen, while most of the carbon is unconsumed. The smoke ascends into the chamber, and is mostly deposited upon the hanging canvas or sacking, and upon the inner surface of the iron cone, from which it falls after a certain thickness is collected. The cone is so held by a chain and pulley that it may be lowered, which operation scrapes the lampblack off the sacking. The lampblack thus prepared is not pure charcoal, as it is mingled with resinous and bituminous substances, with ammoniacal and other matters. By heating it to redness in a vessel permitting no access of air, the impurities are driven off, and an almost pure impalpable charcoal powder remains. Other kinds of black are used in the arts, such as Spanish black, which is made from cork; vine black, made from vine tendrils; and peach black, made from peach kernels, which has a bluish color. German or Frankfort black, used in making copperplate ink, is said to be made by carbonizing a mixture of grape and wine lees, peach kernels, and bone shavings.

**LAMPREY**, a cyclostome or marsipobranch fish of the family *petromyzonidae* (*hyperoartia*, Müller), and genus *petromyzon* (Linn.). This order, with the myxinoidea, constitutes the class of myzonts of Agassiz. The blood is red, the heart distinct, the branchial artery without a bulb and furnished at the base with two valves; the body smooth, cylindrical, and vermiform; mouth anterior, gills fixed, and eyes distinct; the single olfactory cavity opens above by an external foramen, leading to a blind canal not communicating with the mouth through a perforated palate as in the myxinoidea; thorax cartilaginous, sustaining the branchial apparatus composed of rib-like strips descending on each side beneath the skin, with seven external spiracles, opening from the fauces into a sub-oesophageal tube, having a posterior caecal extremity. These are the first fishes in which there is a distinct brain enclosed in a cartilaginous cranium; there are two dorsal fins, the

posterior joined with the caudal, and mere folds of skin with scarcely perceptible rudimentary rays; pectorals and ventrals absent; the cephalic cartilage is undivided; there is a spout hole on the head, and a spiral valve in the intestine; there is no oviduct nor seminal duct. The jaws are absent, but the circular mouth, tongue, and pharynx are armed with conical or crescentic sharp teeth of indurated albumen. The gills are seven little fixed bags, each having its proper artery, its opening into the sub-oesophageal tube, and its external foramen by which the water passes out.—The old genus *petromyzon* has been subdivided into six, according to the shape and arrangement of the teeth. The common European lamprey, or lamprey eel as it is often called (*P. marinus*, Linn.), attains a length of more than 3 ft.; the color is yellowish marbled with brown. Having no air bladder and being destitute of lateral fins, they are usually found near the bottom, and to avoid being carried away by the currents they attach themselves to stones by means of the tongue, which acts like a sucking piston in the circular mouth, whence the names of *petromyzon* and cyclostomes; in the same manner they attach themselves to larger fishes, which they devour; by means of the apparatus above described, respiration may be carried on independently of the mouth, the branchial currents passing from one series of openings to the other across the sub-oesophageal tube. The intestine is small and nearly straight; the eggs are laid late in the spring, the milt and roe escaping by a membranous sheath communicating with the abdominal cavity. They ascend rivers from the sea to spawn. They are very generally distributed in Europe from the Mediterranean to the arctic waters, ascending the rivers in spring; at this season great numbers are caught, their flesh being considered a delicacy. The food of the lamprey consists of any soft animal matter, especially the flesh of fishes to which they attach themselves. The river lamprey or lampern (*P. fluviatilis*, Linn.) is a smaller fish, and confined to fresh or brackish water; the length is from 12 to 18 in., and the color bluish olive above and silvery below. Great numbers were formerly caught in the Thames, Severn, &c., and sold to the Dutch for bait in the turbot fishery. This and the preceding species are very tenacious of life, living several days out of water.—The most common of the American species is the *P. Americanus* (Lesueur), growing about 2½ ft. long; the color is olive brown above, with blackish brown confluent patches, and beneath uniform dull brown. This is not uncommon in the rivers of New England and New York, especially near their mouths; it likes best shallow rapid streams with pebbly bottoms, in which it builds circular nests 3 or 4 ft. in diameter and a foot or two high, bringing stones in the mouth varying from the size of a hen's egg to that of the fist. They ascend high falls by clinging to the rocks, after suddenly dart-

ing forward; though uncommon in rivers obstructed by dams, they are abundant at their outlets, especially in the Merrimack near Lowell. Several other species are described in Dr.



Lamprey (*Petromyzon Americanus*).

Storer's "Synopsis of the Fishes of North America."—The genus *ammocetes* (Duméril) has the same cylindrical body, branchial apertures, and fins as the lampreys; the mouth is semicircular, without teeth, the posterior lip transverse and serrated within; the branchial apertures open internally into the oesophagus itself; the incomplete circle of the mouth prevents its adhering to rocks and other bodies; the external branchial openings are placed in a longitudinal furrow. It is often called mud lamprey, from its being found in the mud and sand. The best known species in Europe is *A. branchialis* (Cuv.), 6 or 7 in. long, about as thick as a goose quill, generally of a yellowish brown color above, darker on the head and back, lighter beneath; the eyes are very small; it spawns at the end of April, and feeds upon worms, insects, and dead matter, living in fresh water in many countries of Europe. Dr. Storer describes three species as occurring in North America, the *A. bicolor* (Lesueur), *A. concolor* (Kirtland), and *A. unicolor* (De Kay). From its resemblance to the lamprey, *ammocetes* was called *petromyzon* by the early writers. Aug. Müller (in his *Archiv*, 1856) maintains that *ammocetes* is the larval form of *petromyzon*, and does not attain the perfect state until the fourth year from the egg; subsequent observations confirm this view, which, if true, is a remarkable instance of partial metamorphosis in fish, and shows upon what transitory characters genera may be founded. According to Van der Hoeven, the cleavage of the yolk is entire, and in the first stage of development there is much analogy with that of the frog.

**LAMP SACUS**, an ancient Greek city of Mysia in Asia Minor, situated on the Hellespont near where it expands into the Propontis. Its original name was Pityusa, but it was colonized at an early period by Ionians from Phocæa and Miletus, who called the place Lampsacus. It had an excellent harbor, and acquired extensive commerce. Miltiades, son of Cypselus, who had established himself in the Thracian Cher-

sonese, made war on the Lampsacenes, but was surprised and taken prisoner by them. Croesus espousing his cause, they restored him to freedom. After the rise of the Persian power, Lampsacus became subject to it. On the overthrow of the Persians at Mycale (479 B. C.), Lampsacus joined the Athenian confederacy, but it revolted when intelligence arrived of the destruction of the Athenian armament and army in Sicily (413). It was reduced by Strobichides, and remained dependent on Athens till the time of Alexander, when it was absorbed in the Macedonian, and subsequently in the Roman dominions. In the age of Strabo it was still a place of importance. Charon the historian, Anaximenes the rhetorician, and Metrodorus the philosopher, were natives of Lampsacus, which was also a chief seat of the worship of Priapus. Its territory was famous for wine. The name of Lampsacus is still preserved in that of Lapsaki, a small village 5 m. S. of Gallipoli, near the probable site of the ancient city, of which no trace now remains.

**LAMP SHELL.** See BRACHIOPODA.

**LANARK**, the county town of Lanarkshire, Scotland, on the river Clyde, 656 ft. above the sea, 23 m. S. E. of Glasgow, and 31 S. W. of Edinburgh; pop. in 1871, 5,099. It consists of one main and several smaller streets, is paved and supplied with gas and water, and has six churches and various public institutions. Its inhabitants are employed chiefly in hand-loom weaving for the Glasgow and Paisley manufacturers. Shoes are also made. There are several breweries and flour mills.—About 1 m. S. is the manufacturing village of NEW LANARK, on the Clyde; pop. about 1,700. This village owes its origin to David Dale, who erected a cotton factory there in 1784. He was succeeded in the management by his son-in-law, Robert Owen, who in 1815 attempted an economical experiment among the workpeople. They numbered about 2,500, and were under his control till 1827, when he retired from the management of the works. The establishment was not successful, and no trace of its peculiar features now remains.

**LANARK**, a N. E. county of Ontario, Canada; area, 1,197 sq. m.; pop. in 1871, 33,020, of whom 16,507 were of Irish, 11,873 of Scotch, and 3,220 of English origin or descent. It is watered by the Mississippi river, an affluent of the Ottawa, by the Rideau, and by several small lakes, and is traversed by the Brockville and Ottawa railway. Capital, Perth.

**LANARKSHIRE**, or **Clydesdale**, an inland county of Scotland, bordering on the counties of Dumbarton, Stirling, Linlithgow, Edinburgh, Peebles, Dumfries, Ayr, and Renfrew; area, 888 sq. m.; pop. in 1871, 769,339. The river Clyde traverses the county from S. S. E. to N. N. W., and with its tributaries is noted for beautiful river scenery. The falls of Bonnington, Corra Linn, and Stonebyres are much visited by lovers of the picturesque. The county is nominally divided into three wards,

the upper or south ward, the middle, and the lower or north ward, the last containing the city of Glasgow; the upper is mountainous, the middle hilly, and the lower level. The Lowther hills, along the south, are from 2,000 to 3,000 ft. high, but afford extensive ranges of pasturage. In these hills are valuable lead mines, consisting of four principal veins 4 to 10 ft. thick, one of which has been wrought to a depth of 140 fathoms, the pure ore in one place having been found 14 ft. wide. Coal is however the most important of the mineral treasures of the county, the fields comprising 55,000 acres. There are also important iron mines and immense fields of fire clay. Dairy husbandry is carried on with great success. Oats are the principal grain crop, but wheat and barley are extensively grown. Clydesdale is noted for its orchards, as well as for its breed of draught horses. It is the seat of vast manufacturing industry in collieries, iron works, and cotton, flax, silk, and woollen. In the time of James III. of Scotland gold was found in Lanarkshire, from which coins were struck called unicorns. Capital, Lanark.

**LANCASHIRE**, or **Lancaster**, a N. W. county of England, bordering on Cumberland, Westmoreland, Yorkshire, Cheshire, and the Irish sea; area, 1,905 sq. m.; pop. in 1871, 2,819,495. The surface is nearly level, except in the north and east. The long ridge known as the "backbone of England" separates the county from Yorkshire on the east, and the N. district is broken by Conistone Fells (2,577 ft. high) and other considerable eminences. The Duddon, Lune, Wyre, Ribble, Mersey, and Irwell are the principal rivers. The coast is deeply indented by bays and arms of the sea, of which Morecambe bay and the estuary of the Ribble are the most important. Morecambe bay and a part of Westmoreland detach the most northern part from the rest of the county. The prevailing geological formations are limestone and carboniferous and new red sandstone. The Lancashire coal field covers 400 sq. m. of the south and southwest of the county, thus underlying the whole of the manufacturing districts, and extending into Cheshire and North Wales on the one side, while on the other it is separated by but a brief interval from the coal fields of Yorkshire. Copper, iron, and lead are also found. Peat mosses form a remarkable feature of the surface. The principal of these swamps was formerly Chatmoss, about 5 m. long, once considered irclaimable, but now mostly under cultivation. The climate is humid, but temperate, and the soil moderately fertile. Dairy and hay farms are numerous, and potatoes are more extensively grown than in any other English county. Lancashire owes its importance chiefly to its manufactures and commerce. The most important manufactures are cotton, woollens, worsted, flax, and silk goods, hats, paper, and soap. The manufacturing districts are traversed by a large number of canals and rail-

ways, and include the towns of Manchester, Bolton, Preston, Blackburn, Oldham, Ashton, Stockport, Bury, Chorley, Wigan, and Rochdale. Capital, Lancaster; chief commercial city, Liverpool.—Lancashire was made a county palatine by Edward III. Riots took place in many parts of the county in 1826 for the destruction of power looms. It suffered greatly from the cotton famine during the American civil war; in January, 1863, there were 228,992 operatives unemployed, and £1,864,121 was contributed for their relief. The duchy of Lancaster is annexed to the crown, and its net revenue is paid into the sovereign's privy purse. The receipts in 1870 were £53,868, and the expenditures £15,136.

**LANCASTER**. I. A S. E. county of Pennsylvania, bounded S. W. by the Susquehanna river and S. E. by Octorara creek; area, 928 sq. m.; pop. in 1870, 121,340. The surface is uneven, South mountain extending along the N. W. frontier, and Mine ridge passing through the S. E. part. The surface between these mountains is undulating and traversed by many small streams. Blue limestone, roofing slate, marble, chrome, and magnesia are found in the county. The soil is a rich calcareous loam. The Reading and Columbia and the Pennsylvania Central railroads pass through it. The chief productions in 1870 were 2,077,413 bushels of wheat, 88,245 of rye, 2,820,825 of Indian corn, 1,943,577 of oats, 419,755 of Irish and 33,821 of sweet potatoes, 2,692,584 lbs. of tobacco, 20,092 of wool, 2,462,376 of butter, 82,614 of cheese, and 124,185 tons of hay. There were 21,409 horses, 2,504 mules and asses, 31,368 milch cows, 1,142 working oxen, 32,249 other cattle, 11,821 sheep, and 50,070 swine; 1,616 manufacturing establishments, having an aggregate capital of \$9,504,162, and an annual product of \$14,034,180. The most important were 24 manufactories of agricultural implements, 31 of brick, 90 of carriages, 9 of cotton goods, 13 of woollens, 32 of iron in various forms, 45 of lime, 13 of machinery, 2 of printing paper, 6 of patent medicines, 47 of saddlery and harness, 44 of tin, copper, and sheet-iron ware, 143 flour mills, 26 tanneries, 18 currying establishments, 12 breweries, 5 planing mills, and 11 saw mills. Capital, Lancaster. II. An E. county of Virginia, on Chesapeake bay and on the N. side of Rappahannock river; area, 161 sq. m.; pop. in 1870, 5,355, of whom 3,157 were colored. The surface is nearly level, and the soil is fertile. The chief productions in 1870 were 12,978 bushels of wheat, 108,940 of Indian corn, and 22,544 of oats. There were 560 horses, 716 milch cows, 1,473 other cattle, 700 sheep, and 2,913 swine. Capital, Lancaster Court House. III. A N. county of South Carolina, bordering on North Carolina, and bounded E. by Lynche's creek and W. by Catawba river; area, 690 sq. m.; pop. in 1870, 12,087, of whom 5,924 were colored. The surface is diversified. The chief productions in 1870 were 15,872 bushels of

wheat, 100,113 of Indian corn, 16,135 of oats, 7,933 of sweet potatoes, 30,292 lbs. of butter, and 3,414 bales of cotton. There were 642 horses, 725 mules and asses, 1,539 milch cows, 2,848 other cattle, 2,366 sheep, and 4,247 swine. Capital, Lancasterville. **IV.** A S. E. county of Nebraska, watered by Salt creek and the Little Nemaha river; area, 864 sq. m.; pop. in 1870, 7,074. The surface is diversified and the soil fertile. Salt springs are found. It is traversed by the Atchison and Nebraska, the Burlington and Missouri River, and the Midland Pacific railroads. The chief productions in 1870 were 133,187 bushels of wheat, 134,400 of Indian corn, 73,239 of oats, 32,118 of potatoes, 94,018 lbs. of wool, and 7,974 tons of hay. There were 1,614 horses, 3,022 cattle, 905 sheep, and 2,205 swine. Capital, Lincoln, which is also the state capital.

**LANCASTER**, a city and the capital of Lancaster co., Pennsylvania, on the Conestoga river and the Pennsylvania Central railroad, in the midst of a rich agricultural region, 68 m. by rail and 60 m. in a straight line W. of Philadelphia, and 34 m. S. E. of Harrisburg; pop. in 1850, 12,369; in 1860, 17,603; in 1870, 20,233, of whom 3,375 were foreigners. The river from this point to where it enters the Susquehanna, at Safe Harbor, a distance of 19 m., was in 1826 made navigable for small craft by means of dams and locks. By this route, as well as by the railroad to Columbia, 12 m. distant, great quantities of coal and lumber are brought to Lancaster, the trade in these articles forming a considerable portion of the business of the place. The principal part of the town is elevated nearly 100 ft. above the Conestoga, from which the city is supplied with water, which is raised by machinery to two large reservoirs. The streets are generally straight, well paved, and lighted with gas, and cross one another at right angles; the two principal ones, King and Queen, intersect in a wide central plaza, which is generally crowded on market days. In a bend of the river in the S. part of the city is Woodward Hill cemetery, a large and picturesque ground. Most of the city is substantially built of brick, many of the houses, particularly those erected recently, being elegant and commodious. Among the public buildings, one of the most imposing is the court house, which is 160 ft. long, 70 ft. wide, two stories high, and surmounted by a dome. The county prison, a large castellated building of old red sandstone, contains 80 cells, and is kept on the solitary labor system. Its tower, 102 ft. high, is the first object which strikes the eye of a traveller approaching Lancaster. The old jail, famous as the scene of the murder of the Conestoga Indians in 1763 by the Paxton boys, was taken down in 1851, and Fulton hall, a large and elegant building, used for concerts and as a theatre, now occupies its site. A handsome monument of New Hampshire granite has recently been erected in the central square in memory of

the soldiers of Lancaster co. who fell in the civil war. There are several iron foundries and blast furnaces, extensive manufactories of locomotives, rifles, carriages, axes, &c., and three national banks, with an aggregate capital of \$890,000. Lancaster is divided into nine wards, and is governed by a mayor with a select council of one and a common council of three from each ward. The valuation of property for the year ending June 1, 1873, was \$4,744,000; expenditures, \$91,878; debt, \$369,353 96. The public schools are graded, including a boys' and a girls' high school, and are in a flourishing condition. Franklin and Marshall college was established here in 1853 by the consolidation of Franklin college, which had existed for many years as a high school, with Marshall college, which was transferred from Mercersburg. It is under the control of the German Reformed church, and has a collegiate and a preparatory course. In 1873-'4 it had 11 professors (4 in the preparatory department), 84 collegiate and 64 preparatory students, and libraries containing 12,000 volumes. The buildings, which stand on a commanding eminence in the N. W. corner of the city, are neat and substantial. In connection with the college, but under a separate board of trustees, is a theological seminary, organized in 1825, which in 1873-'4 had 3 professors, 34 students, a library of 8,000 volumes, and an endowment of \$80,000. Besides those of the college and theological seminary, there are five libraries, viz.: the Lancaster, with 2,000 volumes; Mechanics', 4,200; Athenæum, 2,000; law library association, 3,700; young men's Christian association, 2,500. Three daily and seven weekly (two German) newspapers and seven monthly (one German, and one English and German) periodicals are published, and there are 21 churches.—Lancaster was founded about 1718, and for some years was called Hickory Town. On the organization of the county in 1729, and the removal of the seat of justice from Conestoga in 1730, it took its present name. In 1742 it was chartered as a borough, and in 1818 made a city. In 1777 congress sat here for a few days. From 1799 to 1812 it was the capital of the state, and from 1750 to 1825 was the largest inland town in the country.

**LANCASTER**, a city and the capital of Fairfield co., Ohio, on Hocking river, the Hocking canal, and the Columbus and Hocking Valley and Cincinnati and Muskingum Valley railroads, 25 m. S. E. of Columbus; pop. in 1870, 4,725. The surrounding country is fertile, and contains many vineyards; the scenery is beautiful. The city is well built, the streets being wide and handsome, and many of the public and other buildings attractive. The court house, of stone, erected at a cost of \$150,000, is one of the finest in the country. The state reform school for boys, with 400 inmates and a farm of 1,400 acres mostly devoted to fruit raising, is 6 m. from Lancaster. The principal



manufactories are three of agricultural implements and machinery, one of shovels and miners' tools, a woollen mill, two flouring mills, two planing mills, two breweries, a large wine cellar, and railroad machine shops. There are two national banks, six hotels, graded public schools, including a high school, two weekly newspapers, and 11 churches.

**LANCASTER**, a municipal borough and river port of England, capital of Lancashire, on the left bank of the Lune, on the canal from Preston to Kendal, and on the Preston, Lancaster, and Carlisle railway and a branch of the Great Northwestern, 44 m. N. by E. of Liverpool; pop. in 1871, 17,248. It is built chiefly on the side of a hill, the summit of which is crowned by a church and castle. The older streets are narrow, but many of the houses are handsome, and there are several striking public buildings. The river is here crossed by a bridge of five arches and a magnificent aqueduct for the ca-

from Torbay in 1601, with five vessels, and returned to England in 1603, having established commercial relations with the princes of Bantam in Java and Acheen in Sumatra. He entered warmly into the projects for discovering a N. W. passage to India, and strongly urged the government to attempt it. Baffin named after him a sound opening into Baffin bay. Lancaster was knighted by Queen Elizabeth.

**LANCASTER, Joseph**, an English educator, born in London in 1771 or 1778, died in New York, Oct. 24, 1838. In 1798 he opened a school for poor children in Southwark on the principle of mutual instruction, first introduced in India by Dr. Andrew Bell. He taught almost gratuitously, and the number of his pupils gradually increased to 300. His success attracted public attention, subscriptions poured in to him from all quarters, and numerous schools on the same plan were opened by him in different parts of the country. From 1807 to 1811

he travelled through the country, lecturing on education. In 1812 he attempted to found a school for children of opulent parents, but failed, and became insolvent. He emigrated in 1818 to the United States, where he was well received, but injured his prospects by imprudence. In 1829 he went to Canada, where the legislature made some pecuniary grants to enable him to give his system a fair trial. Again becoming embarrassed, some of his friends purchased for him a small annuity, and he removed to New York. He wrote



Lancaster Castle.

nal. The town hall, county lunatic asylum, baths, assembly rooms, custom house, churches, and castle are the most interesting edifices. A commodious building, formerly the theatre, contains a music hall and the museum of the natural history society. The castle is remarkable for its size and elegance, and embraces the courts, jail, penitentiary, &c. The principal manufactures are furniture, cotton, sail cloth, and cordage. The foreign trade is mostly removed to Liverpool, but it has still considerable commerce.

**LANCASTER, House of.** See ENGLAND, vol. vi., pp. 609-11.

**LANCASTER, Sir James**, an English navigator, born about 1550, died in 1620. He sailed from Plymouth April 10, 1591, with three vessels, visited Ceylon and Sumatra, and dispossessed the Spanish and Portuguese trade. He was appointed to command the first expedition sent out by the English East India company, sailing

a work on "Improvement in Education" (London, 1805), several elementary school books, and pamphlets in defence of his system, which has been known by his name and successfully practised in many parts of Great Britain and other countries.

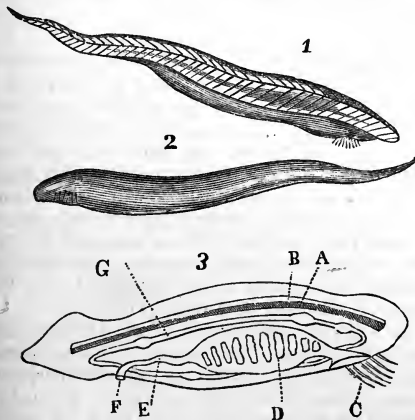
**LANCASTER SOUND**, a channel leading from Baffin bay W. to Barrow strait, in the American arctic regions. Its E. entrance lies between Capes Horsburgh on the north and Liverpool on the south, in lat. 73° 45' to 74° 55' N., lon. 79° W. On the west it opens into Prince Regent inlet, Barrow strait, and Wellington channel. It is the entrance to the N. W. passage, and was probably in the course of Sir John Franklin's last voyage. Its length is about 250 m., its central breadth about 65 m. The great island of North Devon forms its northern coast, and several islands formerly thought to be part of Cockburn island its southern. On the former side Croker bay

opens into it; on the latter it receives Navy Board and Admiralty inlets. It was discovered by Baffin in 1616.

**LANCE**, a weapon. See ARMS.

**LANCE**, **George**, an English painter, born at Little Easton, near Colchester, March 24, 1802, died June 18, 1864. He studied with Haydon, and first exhibited at the academy in 1828. His favorite subjects were fruit, flowers, game, &c., arranged in picturesque and effective confusion, and executed with an elaborateness and a richness of color almost equalling the efforts of the old Dutch masters of still life. Sometimes figures are introduced, as in his "Red Cap," in which a monkey is represented presiding over a table covered with fruits and festal appointments. He also painted historical and imaginative pieces. He restored a large portion of the celebrated "Boar Hunt" of Velasquez in the British national gallery.

**LANCELET** (*branchiostoma* or *amphioxus*), the lowest known of the vertebrate animals, constituting the order *pharyngobranchii* of Huxley, the *leptocardia* of Haeckel, who regards it as a primary division of the branch of vertebrates. This anomalous fish has been found on the coasts of Great Britain and Sweden, in the Mediterranean, on our southern Atlantic coast, and in the Indian ocean. It is from 1½ to 2 in. long, tapering at each end, ribbon-like, translucent, and silvery white; it generally burrows in the sand in deep water, feeding on minute animalcules. Along the back runs a median fin, expanding at the tail into a lancet-shaped caudal; there are no apparent pectorals and ventrals; at the lower surface, extending



Lancelet (*Amphioxus lanceolatus*).

1. Upper side. 2. Lower side. 3. Anatomical diagram: A, notochord; B, spinal chord; C, mouth surrounded by cilia; D, greatly dilated pharynx perforated by ciliated clefts; E, intestine terminating in anus; F; G, haemal system.

forward from the anal and branchial apertures, are two lateral folds, which led Pallas to regard it as a gasteropod mollusk. The mouth is a longitudinal fissure, in the front of the head, without jaws, but surrounded by several car-

tilaginous filaments. The mouth opens into a greatly developed pharynx or throat, the walls of which, strengthened by cartilaginous filaments, are perforated by transverse slits, the whole covered with a thickly ciliated or fringed membrane; this is the respiratory sac, the water entering by the mouth, passing between the branchial slits and over the ciliary fringes filled with blood into the abdominal cavity, and escaping by an opening on the lower surface in front of the vent (*porus abdominalis* of Müller). From the branchial sac the intestine, having a liver-like organ attached, extends to an oval aperture under the tail. There is no single contractile cavity or heart, the only exception in vertebrates, the circulation being effected by several contractile dilatations of the great blood vessels, as in the annelids; the blood is colorless. There is no proper skeleton; the vertebral column, moto-chord or *chorda dorsalis*, is a semi-gelatinous rod, enclosed in a sheath and supporting the spinal cord, and is composed of 60 to 70 fibrous laminae loosely attached to each other; there is also a cartilaginous apparatus supporting the mouth, and 70 to 80 hair-like ribs surrounding the branchial cavity. There is no skull, and no expansion of the spinal cord into a brain, though from its anterior extremity are given off nerves to the rudimentary eyes, and perhaps other nerves of special sense. The arrangement of the muscles is fish-like; the skin is thin, but tough and scaleless. The location of the respiratory system in the anterior portion of the intestinal canal is met with also in the cyclostome fishes. This most aberrant form is clearly a vertebrate, though it has no brain, and the respiration and circulation of an annelid. It has been believed by some to favor the idea of Kowalewsky and Kupffer, that the ascidians show a kinship to the vertebrates, and it certainly has some remarkable invertebrate features found in no other vertebrate animal. The common species is the *B. lanceolatum*.

**LANCELOT**, **Dom Claude**, a French grammarian, born in Paris about 1615, died at Quimperlé, April 15, 1695. In early life he attracted the attention of Duvergier de Hauranne, the celebrated abbot of St. Cyran, and through his influence he joined the recluses of Port Royal, whom he greatly assisted in the organization and management of their schools. He wrote grammars of the Latin, Greek, Italian, and Spanish languages, and a *Grammaire générale et raisonnée*, better known as *Grammaire de Port Royal*, which has been frequently reprinted. On the dispersion of the society of Port Royal in 1660, Lancelot became preceptor of the duke of Chevreuse's son, and from 1669 to 1672 was attached in the same capacity to the two young princes of Conti. In 1673 he retired to the abbey of St. Cyran, where he led a life of austerity; and in 1680 was ordered to Quimperlé, where his last years were spent in devotion. Besides his philological works, he left a manuscript memoir of the abbot of St.

Cyran, which was published in Cologne in 1738, and an account of a tour in 1667 to La Grande Chartreuse and Alet (London, 1813).

**LANCELOT OF THE LAKE**, a hero of British mythology, one of the knights of King Arthur's round table. He was brought up at the court of Vivien, the Lady of the Lake, whence his surname. He became Arthur's favorite knight; and when the king was about to marry, he was sent to conduct the royal bride, Guinevere, to the court. Afterward he is represented as carrying on an intrigue with the queen, which is the origin of most of his adventures. He is the subject of a celebrated romance by an unknown author, which was originally written in Latin, and was translated into Anglo-Norman by Walter Mapes in the latter part of the 12th century. Tennyson has used the character of Lancelot more than any other modern poet, making him the hero of two of the "Idyls of the King," viz., "Elaine" and "Guinevere." Elaine, "the lily maid of Astolat," preserves his shield in her chamber, which he had exchanged for her brother's when he went to tilt for the great diamond, dreaming over it, and finally dies broken-hearted because her love for Lancelot is not returned.

**LANCEWOOD**, a wood imported from the West India islands and South America in poles from 15 to 20 ft. long and 3 to 6 in. in diameter. The tree is the *Duguetia Quitarensis*, of the *anonaceæ*, the family to which our papaw belongs. It resembles boxwood, but is of somewhat paler yellow. It is remarkably stiff and elastic, and is consequently well adapted for the shafts of carriages, bows, and springs. It is largely employed for these, as well as for surveyors' rods, billiard cues, and rules, which ordinarily pass for boxwood, and for anglers' rods. Species of *ozandra* and *cananga*, of the same family, are called lancewood in Jamaica.

**LANCISI, Giovanni Maria**, an Italian physician, born in Rome, Oct. 26, 1654, died there, Jan. 21, 1720. He abandoned the study of theology for the natural sciences, and at 18 graduated doctor in medicine and philosophy at the Sapienza college in Rome. In 1676 he was appointed assistant physician to one of the hospitals, and some time later was nominated to the chair of anatomy at the Sapienza, which he filled with great reputation for 13 years. Innocent XI. in 1684 presented him with a canonry. He filled various professional offices, and wrote a number of valuable works, chiefly relating to his favorite studies of anatomy, natural philosophy, and mathematics. A collection of them appeared in his lifetime (2 vols. 4to, Geneva, 1718), and a complete edition in folio was published at Venice in 1739.

**LANDAU**, a fortified town of Rhenish Bavaria, on the Queich, 18 m. N. W. of Carlsruhe, on the railway from Paris to Mentz; pop. in 1871, 6,921, exclusive of the garrison. The ground plan of the ramparts is an octagon, surrounded by moats. The barracks and casemates are bomb-proof. The town is regularly built, has

two gates, a large parade, a church used by Protestants and Catholics in common, various public offices, and some manufactories. During the thirty years' war it was taken seven times by the troops of Count Mansfeld, by the Spaniards, Swedes, imperialists, and French. In 1680 it was ceded to France and fortified by Vauban. It was taken in 1702 by Margrave Louis of Baden, but was recovered by the French in 1703, taken by the Austrians in 1704, and held till 1713, when it was again ceded to France. It sustained a siege of nine months in 1793, when 30,000 shells were thrown into it. The treaty of Paris in 1814 confirmed it to France, but the treaties of 1815 gave it to Bavaria, as a fortress of the Germanic confederation.

**LANDEN, John**, an English mathematician, born at Peakirk, near Peterborough, in January, 1719, died Jan. 15, 1790. From 1762 to 1788 he was agent for Earl Fitzwilliam. His earliest mathematical writings appeared in the "Ladies' Diary" for 1744, and most of his subsequent papers were contributed to the "Transactions" of the royal society of London, of which he was admitted a member in 1766. He is best known by his "Residual Analysis" (London, 1764), in which he proposed a new form of fluxionary calculus, and invented a set of symbols. His plan has been thought an improvement on the method of ultimate ratios, but it lacks simplicity, and was never in general use. The principal other works of Landen are: "Mathematical Lucubrations" (4to, London, 1755); "Animadversions on Dr. Stewart's Computation of the Sun's Distance" (4to, 1771); "Observations on Converging Series" (4to, 1781); "Mathematical Memoirs" (2 vols. 4to, 1780-'89).

**LANDER**, a N. county of Nevada, intersected by Humboldt river and watered by the Reese; area, 10,000 sq. m.; pop. in 1870, 2,815, of whom 218 were Chinese. The surface is diversified with mountains, hills, and valleys, comprising mineral, agricultural, and grazing lands. S. of the Humboldt are high mountain ranges, enclosing extensive valleys, some of which are fertile. These mountains form the most important metal-bearing portion of the county. The Reese river region in the S. W. is one of the principal mining districts of the state. The Central Pacific railroad crosses the county from E. to W. In 1873 the E. half, comprising the Eureka district and other rich mining sections, was set off to form Eureka co., reducing the area given above. The principal metal is silver, but considerable lead and some gold are found. The shipments of bullion in 1871 amounted to \$3,800,000. The chief agricultural productions in 1870 were 1,363 bushels of wheat, 2,062 of oats, 29,307 of barley, 17,599 of potatoes, 4,600 lbs. of wool, 20,950 of butter, and 2,245 tons of hay. There were 597 horses, 570 milch cows, 7,695 other cattle, 1,501 sheep, and 205 swine; 3 manufactories of pig lead and 1 quartz mill. Capital, Austin.

**LANDER, Richard**, an English traveller, the discoverer of the course of the river Niger in Africa, born in Truro, Cornwall, in 1804, died on the island of Fernando Po in February, 1834. He was brought up as a printer, but in 1825 accompanied Capt. Clapperton upon his second African expedition. After the death of Clapperton he returned to England, and published "Records of Capt. Clapperton's Last Expedition to Africa" (2 vols. 8vo, London, 1829-'30), prepared from Clapperton's papers and his own journal. In January, 1830, accompanied by his brother John, he sailed for Africa under government auspices to continue the explorations. Departing from Badagry near Cape Coast Castle, March 22, he reached Boossa on the Quorra, or Niger, June 17. Thence the brothers ascended the river 100 m. to Yaorie, and returning to Boossa early in August, commenced the descent of the stream in canoes, Sept. 20. They reached the mouth of the river through its principal arm, the Nun, in the latter part of November, and in June, 1831, arrived in England. In the succeeding year a narrative of the expedition, prepared by Lieut. Becher from the account of the Landers, was published in 2 vols. with a map. They were the first to ascertain the confluence of the Niger with the Benoowe or Tchadda. In 1832 an expedition, consisting of a brig and two small steamers, organized by a company of Liverpool merchants for the purpose of opening a trade with the tribes along the Niger, and placed under the command of Richard Lander, ascended that river to Boossa. The natives showed little disposition to trade with the Europeans, and Lander returned ill to the seacoast in the succeeding spring, with the loss of several of his men by sickness. In July he reascended the river; but the expedition, as a commercial venture, was a failure. On this voyage he ascended the Benoowe as far as the country of Domah, 104 m. On Nov. 27 the expedition was again in motion up the river under the command of Dr. Oldfield. Richard Lander, following with supplies, was wounded, Jan. 20, 1834, in a conflict with the natives of the Eboe country. He escaped in a canoe, and reached Fernando Po, where he died soon after. In 1835 an account of his last voyage was published under the title of "Narrative of the Expedition into the Interior of Africa by the River Niger, in the Steam Vessels Quorra and Alburkah, in 1832, 1833, and 1834, by McGregor Laird and R. A. K. Oldfield, surviving officers of the expedition."

**LANDERNEAU**, a seaport of Brittany, France, in the department of Finistère, 14 m. E. N. E. of Brest; pop. in 1866, 7,853. The town is built on both sides of the Éloron or Landerneau, near its entrance into the roadstead of Brest, and has a good harbor. It contains a fine Gothic church, a communal college, a large convent, and extensive marine barracks. Linen, leather, glazed hats, and refined wax are manufactured. The streets are narrow, but

the quays are lined with fine buildings. About 700 vessels enter and clear annually.

**LANDES, Les**, a S. W. department of France, in Gascony, bordering on the bay of Biscay and on the departments of Gironde, Lot-et-Garonne, Gers, and Basses-Pyrénées; area, 3,597 sq. m.; pop. in 1872, 300,528. The name is derived from the sandy and marshy plains which compose the greater part of its surface, and which prevail generally in the interior, and in many places are covered with thorny shrubs over which the shepherds stalk on stilts. The only crops which the *landes* yield are maize and barley. The coast district is studded with numerous lagoons; but toward the south, where the spurs of the Pyrenees break the continuity of the plain, and the tributaries of the Adour irrigate the soil, the country is fertile, and abounds in corn, wine, and various kinds of fruit. The other productions of this department are timber, coal, iron, and marble. The climate is mild, but unhealthy. Among the principal manufactures are glass, porcelain, earthenware, paper, and leather, employing about 6,000 persons. The chief rivers are the Adour, Leyre, and Gave-de-Pau. The department is divided into the arrondissements of Dax, Mont-de-Marsan, and St. Sever. Capital, Mont-de-Marsan.

**LONDON, Letitia Elizabeth (MACLEAN)**, an English authoress, born in Old Brompton, a suburb of London, in 1802, died at Cape Coast Castle, Africa, Oct. 15, 1838. At the age of 13 she began to write poetry, and in 1820 she published in the "Literary Gazette" some short poems, signed "L. E. L.," which attracted considerable attention. She soon became a general contributor to the "Gazette" of reviews and miscellaneous articles, as well as original poems. Her father died in destitute circumstances when she was a child, and she became the chief support of her family, and for 15 years was a ready and prolific writer in prose and verse for the annuals and for a variety of periodicals. In 1821 she published a small collection entitled "The Fate of Adelaide, and other Poems," which was succeeded by "The Improvisatrice" (1824), "The Troubadour" (1825), "The Golden Violet" (1827), "The Venetian Bracelet" (1829), and "The Vow of the Peacock" (1835). Her poetry is mainly of the kind which is warmly admired by youthful readers, but is soon outgrown, full of sentiment and delicate fancies melodiously versified. She also published four novels. In June, 1838, she was married to George Maclean, governor of Cape Coast Castle in West Africa, and soon afterward sailed with him for her new home. She died in a few months after her arrival there, from an overdose of prussic acid, which she had been accustomed to take in small quantities for hysterical affections, and was discovered lying dead upon the floor of her chamber. "The Zenana, and Minor Poems," with a memoir, was published posthumously (1839).—See "Life and Literary Re-

mains of L. E. L.," by Laman Blanchard (2 vols., London, 1841).

**LANDOR, Walter Savage**, an English author, born at Ipsley Court, Warwickshire, Jan. 30, 1775, died in Florence, Italy, Sept. 17, 1864. His parents were very wealthy, and he was educated under private tutors and at Rugby and Oxford. Being rusticated for firing a gun in the quadrangle, he never returned to the university to take his degree. He was designed at first for the army and then for the bar, but ultimately devoted himself entirely to literary pursuits. On the death of his father he succeeded to the family domains, and purchased other estates in Monmouthshire; he expended £7,000 in improving them, and built a mansion which cost £8,000; but in 1806, in disgust with some of his tenantry, one of whom had absconded several thousand pounds in his debt, he sold off his entire property, a part of which had been in his family for 700 years, ordered the mansion to be demolished, and determined to live abroad. In 1808, at the outbreak of the insurrection in Spain against Napoleon, Landor raised a body of troops at his own expense, conducted them to Gen. Blake in Galicia, presented 20,000 reals to the cause, received the thanks of the supreme junta, and was appointed a colonel in the Spanish army. He resigned his commission on the restoration of King Ferdinand and the subversion of the constitution. In 1811 he married Julia Thuillier de Malaperte, of Bath, a daughter of the baron de Nieuveville. From 1815 to 1835 he resided in Italy, then returned to England and resided at Bath till 1858, when he removed again to Italy. For several years he occupied the palace of the Medici at Florence, and then purchased the villa and garden of Count Gherardesca at Fiesole. He published a small volume of poems in 1795, and "Gebir," a long poem, in 1798; but he first really became known as an author by the publication of "Count Julian," a tragedy (1812). In 1820 he published at Pisa his Latin *Idyllia Heroica*, with an appendix in Latin prose on the reasons why modern Latin poets are so little read. His literary reputation was greatly increased by his prose work entitled "Imaginary Conversations" (5 vols. 8vo, London, 1824-'9). These supposed dialogues between remarkable personages of past or present times illustrate the peculiarities of the different interlocutors and of the periods in which they lived, and also abound in paradoxical and original opinions. They were followed by "Pericles and Aspasia" (1836), "A Satire on Satirists and Admonition to Detractors" (1836), the "Pentameron and Pentalogia" (1837), and the dramas "Andrea of Hungary and Giovanna of Naples" (1839). All these works were written in Italy. During his residence at Bath he published the "Hellenics" (1847); "Popery, British and Foreign" (1851); "Last Fruit off an Old Tree" (1853); "Letters of an American" (1854), under the pseudonyme of Pottinger; "Antony and Octavius"

(1856); "Dry Sticks Fagoted" (1858); and frequent contributions to the "Examiner" newspaper. The last named book contained some most objectionable poems, libelling a lady of Bath to whom Landor had conceived an intense personal dislike, for which a judgment of £1,000 was obtained against him. An edition of his collected works was published in London in 1846 (2 vols. 8vo; reprinted in 1853). The first complete edition of his works was commenced in 1874 (7 vols. 8vo, London). His life has been written by John Forster (London, 1869; new ed., 1874). All of Landor's writings contain highly intellectual passages, but his poems especially display an effort to reproduce the genius and style of Hellenic poetry, and seem foreign to modern habits of thought.—His brother, the Rev. ROBERT EYRES LANDOR, is the author of several works, including two remarkable novels, "The Fawn of Sertorius" (2 vols., 1846) and "The Fountain of Arethusa" (2 vols., 1848).

**LANDSBERG**, a town of Prussia, in the province of Brandenburg, on the Warthe, 40 m. N. E. of Frankfort-on-the-Oder; pop. in 1871, 18,531. It is walled and well built, contains a gymnasium, a *Realschule*, three churches, an almshouse, and lunatic and orphan asylums. It has iron founderies and manufactories of woollen and linen cloth, hosiery, leather, paper, and machinery, and an important trade in wool, lumber, and corn.

**LANDSCAPE ARCHITECTURE.** See PARK.

**LANDSCAPE GARDENING.** See PARK.

**LANDSEER. I. John**, an English engraver, born in Lincoln in 1769, died Feb. 29, 1852. His reputation was founded on the engravings furnished for Bowyer's edition of Hume's "History of England" and Moore's "Views in Scotland" toward the close of the last century, and on a series from the works of Rubens, Snyders, and other artists. In 1806 he delivered a course of lectures on engraving at the royal institution, which were published in 1807. At the same time he was elected an associate engraver in the royal academy, an honor which he accepted for the purpose of removing the restrictions against the admission of engravers to full membership. Failing in this object, he devoted himself chiefly to literary pursuits, and started at different periods two art journals, both of which speedily failed. He also published a quarto volume on engraved gems and hieroglyphics. His "Descriptive, Explanatory, and Critical Catalogue of five of the Earliest Pictures in the National Academy" (London, 1834) is full of amusing gossip. His best engraving is the "Dogs of Mount St. Bernard," from one of the earliest pictures of his son, Sir Edwin Landseer. **II. Thomas**, eldest son of the preceding, born about the close of the last century. He adopted his father's profession, and executed many engravings in mezzotint from his brother Edwin's pictures. One of his best known works is an engraving of Rosa Bonheur's celebrated



picture of the "Horse Fair" (1861). His best engravings are after his brother's pictures, of which he has caught the spirit and style. He has published the "Life and Letters of William Bewick" (2 vols., 1871). **III. Charles**, brother of the preceding, a genre painter, born in 1799. He received his first instructions in painting from Haydon, and entered the schools of the academy in 1816. He exhibited in the royal academy in 1828, and several times received the highest prize of the art union. Among his most popular pictures are "Pamela," "Clarissa Harlowe," "The Monks of Melrose," "The Departure in Disguise of Charles II.," and "The Return of the Dove to the Ark." He was elected a royal academician in 1845, and was appointed a keeper in 1851. **IV. Sir Edwin**, brother of the preceding, a painter of animals, born in London in 1803, died there, Oct. 1, 1873. While a child he was remarkable for skill in drawing. His father took him to the fields, and made him copy the ordinary domestic animals, at rest or in motion, from the life, and in the same way caused him to acquire his first notions of color; and at the age of 14 he attracted attention by his spirited sketches. Two years later he exhibited his "Dogs Fighting," which was purchased by Sir George Beaumont, and shortly afterward a striking picture of two St. Bernard dogs rescuing a traveller from the snow, which was engraved by his father. About this time he received to a limited extent instruction and advice from Haydon, but never became a regular pupil. He also drew in the schools of the royal academy, and from the Elgin marbles. In 1827 he was elected an associate member of the royal academy, having just reached the requisite age, and about the same time made a visit to the highlands of Scotland, the impressions derived from which have been reproduced in a series of characteristic works. In 1847 he was elected a member of the royal academy of Belgium; in 1850 he was knighted; and in 1855 he received a gold medal at the universal exposition in Paris, being the only English artist so distinguished. Upon the death of Sir Charles Eastlake, in 1865, he was elected president of the royal academy, but declined the office. Among his best known pictures are: "The Return from Deer-Stalking," exhibited in 1827; "The Illicit Whiskey Still," 1829; "Highland Music," 1830; "Poachers: Deer-Stalking," 1831; "Sir Walter Scott and his Dogs," 1833; "The Drover's Departure," 1835; "A distinguished Member of the Humane Society," 1838; "High Life and Low Life," 1840; "The Shepherd's Prayer," 1845; "The Stag at Bay," 1846; "The Random Shot," 1848; and "Night and Morning" and "The Children of the Mist," 1853. Among his more recent works are "The Connoisseurs," containing a portrait of himself; "The Defeat of Comus;" "Pen, Brush, and Chisel," a sketch of Chantrey's studio; "The Sanctuary;" "Taming the Shrew;" and "Windsor Forest."

From 1858 many of his works were drawings in chalk, which are much admired. For many years his pictures were regularly engraved, and for the copyright of some of them he received as much as £3,000 in addition to the price of the picture. A series has been published entitled "The Forest," from drawings by Landseer. Many of his finest sketches were presented to the duchess of Bedford, between whom and himself a warm friendship existed for years, and are now in the possession of her daughter the duchess of Abercorn. He was incomparably the best animal painter of his time, and he also produced a number of admirable etchings; but it is generally conceded that in designing the lions for the base of Nelson's monument, London, unveiled in 1867, he failed as a sculptor. A sale of his works in London in 1874 realized £73,400. Landseer was noted for his wit and his genial social qualities. He never married. He was buried in St. Paul's cathedral, beside Reynolds and Turner.—See "Early Works of Sir Edwin Landseer," by F. G. Stephens (London, 1868), and "Memoirs of Sir Edwin Landseer," by the same (1874).

**LAND'S END** (anc. *Bolerium Promontorium*), a remarkable headland, the most western point



Land's End.

of Great Britain, projecting into the Atlantic at the W. extremity of Cornwall. It is formed of granite cliffs, whose summits are 60 ft. above the level of the sea. About a mile from it are the dangerous rocks called the Longships, on which is a lighthouse with a fixed light 88 ft. above high water. On a peninsula near by is one of those natural curiosities called "logging" or "logan stones," so poised on a fulcrum that they can be made to rock.

**LANDSHUT**, a town of Bavaria, capital of the district of Lower Bavaria, on the Isar, 39 m. N. E. of Munich; pop. in 1871, 14,141. It has a Protestant and three Catholic churches, two convents, and a Franciscan monastery, a

gymnasium with a Latin school, and an industrial, an agricultural, and a commercial school. In 1800 the university of Ingolstadt was transferred to Landshut, where it remained till 1826, when it was removed to Munich. The castle of Trausnitz, which overlooks the town, was at one time the residence of the dukes of Lower Bavaria; in it Conradin, the last of the Hohenstaufen, was born in 1252. In the latter half of the 14th century, and throughout the 15th, Landshut was the capital of the duchy of Bavaria-Landshut.

**LANDSHUT**, or *Landeshut*, a town of Prussia, in the province of Silesia, on the Bober, 49 m. S. W. of Breslau; pop. in 1871, 5,673. It has several bleaching grounds and a considerable linen trade. The Lutheran church of the Holy Trinity, on a neighboring hill, was one of the six churches which the emperor Joseph I. allowed the Silesian Protestants to build. The Landshuter Kamm, a point of the Riesengebirge near Landshut, is 3,000 ft. high. In June, 1760, the Austrian general Laudon obtained here a great victory over the Prussians.

**LANDSKRONA**, a fortified town and seaport of Sweden, in the län of Malmö, 16 m. N. N. E. of Copenhagen; pop. in 1869, 7,323. It is handsomely built on a tongue of land projecting into the sound, and has a good harbor and a strong citadel. It contains a fine church, an assembly house, a large sugar refinery, an iron foundry, a woollen mill, machine shops, tanneries, and ship yards. Corn, fish, pitch, timber, and alum are exported. Coal fields have recently been discovered in the vicinity. A mile from the shore is the island of Hven, formerly the residence of Tycho Brahe; but nothing of the observatory now remains.

**LANE**, a W. county of Oregon, bounded E. by the Cascade mountains, S. partly by the Sinlaw river, and W. by the Pacific ocean; area, 3,500 sq. m.; pop. in 1870, 6,426. It embraces the head of the Willamette valley, that river being navigable eight months in the year to the county seat. The W. portion is mountainous; the S. portion, forming the valley, is fertile. The Calapooya mountains separate it from the valley of the Umpqua. The Oregon and California railroad passes through it. The chief productions in 1870 were 294,771 bushels of wheat, 235,722 of oats, 24,687 of barley, 32,455 of potatoes, 167,893 lbs. of wool, 155,214 of butter, and 5,381 tons of hay. There were 4,874 horses, 5,158 milch cows, 5,680 other cattle, 52,745 sheep, and 19,557 swine; 1 flour mill and 3 saw mills. Capital, Eugene City.

**LANE**, *Edward William*, an English orientalist, born in Hereford in 1801. The greater part of his life has been devoted to the study of the oriental languages, particularly Arabic, in which he is deeply learned; and for many years he has been employed in preparing an Arabic lexicon and thesaurus, the first part of which appeared in 1863, and the second in 1865, but which is not yet completed. As an author he is widely known by his translation of the

"Arabian Nights," published in three magnificent volumes, with illustrations by W. Harvey (1840), and by his "Manners and Customs of the Modern Egyptians," published by the society for the diffusion of useful knowledge (3d ed., with additions, 2 vols. 8vo, London, 1842), one of the most valuable works of the kind ever published, and the materials for which were procured during a lengthened residence in Cairo. He has also published "Arabian Tales and Anecdotes," and "Eastern Tales and Anecdotes."

**LANFRANC**, archbishop of Canterbury, born in Pavia about 1005, died in Canterbury, England, May 24, 1089. He studied civil law in the university of Bologna, and after practising in Pavia established himself at Avranches in Normandy, where he taught jurisprudence. While on a journey to Rouen he was attacked by robbers, who left him for dead, but was rescued by the monks of the Benedictine abbey of Bec; he entered that order, and in 1046 was chosen prior of Bec. He opened a school to which pupils resorted from England, France, Germany, Flanders, and even Italy. Among the learned men whom his reputation attracted thither was Berengarius, archdeacon of Angers, with whom he carried on a famous controversy on the subject of the eucharist. He denounced the illegal marriage of Duke William of Normandy with his cousin, daughter of the count of Flanders, and was ordered to leave Normandy; but he had an interview with the duke in 1053, became his friend, and procured for him a dispensation from the pope legalizing the marriage. William appointed him a councillor of state, and in 1066 abbot of the newly erected monastery in Caen, where he established a school. In 1067 he declined the archbishopric of Rouen, to which he was chosen by the people; but William caused him to be elected to the see of Canterbury, vacant by the deposition of Stigand, and he was consecrated in 1070. He successfully established the claims of his see to the primacy of England, and gave proof of his attachment to William by placing in vacant bishoprics and over the chief religious houses ecclesiastics of known fidelity to the Norman interest. The chief direction of affairs both in church and state was committed to his hands whenever the king was absent in Normandy. He crowned William Rufus, on whose accession he was intrusted with the government. He improved the discipline of the monastic bodies, enforced the celibacy of the priesthood, established schools, convents, and hospitals, and built churches and cathedrals. His works, consisting of commentaries on St. Paul's epistles, letters, sermons, and his treatise on the eucharist against Berengarius, were published in Paris in 1648 (new ed. by Giles, 2 vols., Oxford, 1844-'5).

**LANFRANCO**, *Giovanni*, an Italian painter, born in Parma in 1581, died in Rome in 1647. While a boy in the service of Count Orazio Scotti in Piacenza, he attracted the attention

of his master by some designs executed upon a wall with charcoal. He was placed under Agostino Carracci, and subsequently studied at Rome with Annibale Carracci, whom he assisted in decorating the Farnese palace. His chief work is the cupola of S. Andrea della Valle in Rome, which is one of the most beautiful in the city, and was the result of four years' study and labor. The paintings at the angles are by Domenichino in his best style. Lanfranco also painted the beautiful cupola of the church of Gesù Nuovo in Naples, which was destroyed by an earthquake in 1688. He executed many minor works, but his cupolas were most famous. He adopted in them a bold, coarse style (even using a sponge, it was said, instead of a brush), which was well adapted to great heights, and made his figures stand out in fine relief.

**LANFREY, Pierre**, a French historian, born in Chambéry in 1828. He completed his studies in Paris, and became known in 1857 by his *L'Église et les philosophes du 18<sup>m</sup>e siècle*, and in 1858 published *Essai sur la révolution française*. In 1860 appeared his *Histoire politique des papes*, and in 1863 *Le rétablissement de la Pologne*. His principal work is the *Histoire de Napoléon 1<sup>er</sup>* (6 vols., Paris, 1867-'74; English translation, London, 1867 et seq.), which, like all his writings, is distinguished by a scrupulous statement of facts. It severely arraigns the moral and political character of the emperor. During the Franco-German war Lanfrey served with the mobiles of Savoy. In February, 1871, he was elected to the national assembly, and in October was appointed by Thiers minister at Bern, a position which he still holds (1874).

**LANG, Heinrich**, a German theologian, born at Frommern, Württemberg, Nov. 14, 1826. He studied under Baur and Zeller in Tübingen, and in 1863 became pastor at Meilen, near Zürich, and in 1871 of St. Peter's church in that city. He established a periodical in the interest of liberal Christianity, and has published many works, the principal of which are: *Versuch einer christlichen Dogmatik* (1857; 2d revised ed., 1868); *Eingang durch die christliche Welt* (1859; 2d ed., 1870); *Stunden der Andacht* (2 vols., 1862-'5); *Religiöse Charaktere* (1862); *Martin Luther* (1870); and *Das Leben Jesu und die Kirche der Zukunft* (1872).

**LANG, Louis**, an American artist, born at Waldsee, Württemberg, March 29, 1814. At 16 years of age he executed likenesses in pastel, and during a residence of four years on the lake of Constance he painted nearly 1,000 portraits in pastel and oil. He went in 1834 to Paris, and about 1838 came to America. In 1841 he went to Italy, and studied in Venice, Bologna, Florence, and Rome. In 1845 he returned to America, taking up his residence in New York, and for two years employed himself in the decoration of interiors and in modelling plaster figures for ornamental purposes. In 1847 he again visited Rome, and remained there two years, returning to New York in 1849.

**LANGBAINE. I. Gerard**, an English scholar, born in Westmoreland about 1608, died in 1658. The greater part of his life was passed at Oxford, where he was provost of Queen's college, and keeper of the university archives. He was an industrious writer, and succeeded in avoiding the political troubles of the time. His chief work was an edition of Longinus, in addition to which he published a number of minor treatises on church questions and miscellaneous topics. **II. Gerard**, son of the preceding, born in Oxford in 1656, died in 1692. He was educated at University college, Oxford, and after a career of idleness and extravagance devoted himself to literary pursuits. He gave particular attention to the history of dramatic literature, and collected, it is said, about 1,000 old plays. He republished a catalogue of plays made by Kirkman, a bookseller, under the title of "Momus Triumphans" (1687). This work was speedily sold off, and was improved into "A New Catalogue of English Plays" (1688). Still further amendments and additions produced his "Account of the English Dramatic Poets" (1691, 1699, and 1719). These catalogues manifest little taste or judgment, but are valuable to the student of dramatic history from the accuracy with which facts are related and editions described. Commentators and others have borrowed copiously from Langbaine, many of them without acknowledgment.

**LANGBEIN, August Friedrich Ernst**, a German author, born near Dresden, Sept. 6, 1757, died in Berlin, Jan. 2, 1835. He studied law, filled various public offices, and from 1820 till his death was censor of belles-lettres publications for the Prussian government. His complete works were published in 31 vols. (Stuttgart, 1835-'7), and comprise humorous poems, tales, and novels, some of which have been very popular. An edition in 8 vols. was published with a memoir by Gedicke in 1839, and a new edition appeared in 1854.

**LANGDON, John**, an American statesman, born in Portsmouth, N. H., in 1739, died there, Sept. 18, 1819. He received a common school education, and entered a counting house. In 1774 he participated in the removal of the armament and military stores from Fort William and Mary in Portsmouth harbor. In 1775 he was a delegate to the continental congress, but resigned in June, 1776, on becoming navy agent. In 1777, while speaker of the New Hampshire assembly, he pledged a large portion of his property for the purpose of equipping the brigade with which Stark defeated the Hessians at Bennington. He served in command of a volunteer company at Bennington and Saratoga, and in Rhode Island. Subsequently he was a member and speaker of the state legislature, a member of the continental congress, a delegate to the convention which framed the constitution of the United States, and president of New Hampshire. In 1788 he was chosen governor of New Hampshire, and in 1789 was elected United States

senator, which office he held till 1801. In politics he was a republican, and acted with Jefferson, who upon assuming office in 1801 offered him the post of secretary of the navy, which he declined. From 1805 to 1812, with the exception of two years, he was governor of New Hampshire; and in 1812 the republican congressional caucus offered him the nomination for the office of vice president of the United States, which, on the score of age and infirmities, he declined. The remainder of his life was passed in retirement.

**LANGE, Johann Peter**, a German theologian, born at Sonnborn, near Elberfeld, April 10, 1802. Of humble origin, he seized occasional advantages for study, spent a year and a half at the gymnasium of Düsseldorf, and in 1822 entered the university of Bonn. He studied theology under Lücke and Nitzsch, and after preaching at Langenberg and Duisburg, became in 1841 professor of church history and dogmatics at Zürich. In the beginning of 1854 he was appointed professor of systematic theology at Bonn, and in 1860 counsellor of the consistory. He has published theological and exegetical works of great thoroughness and ability. The most celebrated are his *Leben Jesu* (3 vols., Heidelberg, 1844-'7; English translation, "The Life of the Lord Jesus Christ," by Sophia Taylor and J. E. Ryland, Philadelphia, 1872), which appeared during the Strauss controversy, and is in some respects one of the ablest works on the subject; *Die christliche Dogmatik* (3 vols., 1849-'52); *Die Geschichte der Kirche* (part i., *Das apostolische Zeitalter*, 2 vols., Brunswick, 1853-'4); and his great *Theologisch-homiletisches Bibelwerk*, forming the basis of what has been published in America as "Lange's Commentary," of which the plan and the treatment of the leading books of the Old and New Testaments are Lange's, and appeared in Germany from 1853 to 1864, while portions are by other scholars. The American translation is edited by Prof. Philip Schaff (New York, 1865 *et seq.*).

**LANGE, Ludwig**, a German archaeologist, born in Hanover, May 4, 1825. He graduated at Göttingen in 1849, and became professor there in 1853, at Prague in 1855, at Giessen in 1859, and at Leipsic in 1871. His principal work is *Handbuch der römischen Alterthümer* (3 vols., Berlin, 1856-'74). In 1874 he published at Leipsic *Die Epheten und der Areopag vor Solon*.

**LANGELAND**, an island of Denmark, between the islands of Laaland and Fünen, separated from the former by the Langeland Belt, and from the latter by a narrow channel of great depth, having the Great Belt on the north and the Baltic on the south; length from N. to S. 33 m., average breadth about 3 m.; area, 106 sq. m.; pop. in 1864, 18,399. The E. coast is washed by a strong current, and has no harbors; the W. coast is free from currents, is deeply indented, contains many excellent harbors, and furnishes throughout one great roadstead with safe anchorage for the largest ves-

sels. The island is fertile, yielding much grain and dairy produce. It is included in the bailiwick of Svendborg. Capital, Rudkiöbing, which is a port with considerable shipping.

**LANGENSALZA**, a town of Prussia, in the province of Saxony, on the Salza, near its entrance into the Unstrut, 17 m. N. W. of Erfurt; pop. in 1871, 9,484. It has four churches, a *Realschule*, a female school of a higher grade, and manufactories of linen and of machines. On June 27, 1866, a battle was fought here between the Prussians and Hanoverians, in which the latter repulsed the Prussians, but on the following day surrendered to them.

**LANGER, Robert von**, a German painter, born in Düsseldorf in 1783, died at Haidhausen, Oct. 6, 1846. He was a son of the historical painter Johann Peter von Langer (1756-1824), and became professor at the academy of Munich and chief director of the national galleries, and organized the Pinakothek. He illustrated Dante's *Inferno*, and his other works consist chiefly of frescoes from Biblical and ancient history. It was mainly through his efforts that Rubens's "Battle of the Amazons" and other works were restored.

**LANGHORNE, John**, an English poet, born at Kirkby-Stephen, Westmoreland, in March, 1735, died in Wells, Somersetshire, April 1, 1779. He took orders, and went to Cambridge, where he supported himself by teaching in a gentleman's family. On account of an unfortunate attachment to the daughter of his employer he left his situation and went to London, where he wrote for periodicals, obtained the curacy of St. John's, Clerkenwell, and was appointed assistant preacher of Lincoln's Inn. In 1765 he published a short poem entitled "Genius and Valor," to defend the Scotch against the aspersions of Churchill; for this he received the degree of D. D. from the university of Edinburgh in 1766, and in 1767 he married the lady to whom he had previously paid unsuccessful suit. She belonged to a wealthy family, and the living of Blagden in Somersetshire was purchased for her husband; but within a year she died in childbed. Langhorne then removed to Folkestone, where, in conjunction with his brother William, who held a curacy in that town, he wrote his translation of Plutarch's "Lives" (1771), the work by which he is best known. He married again, and lost his second wife also in childbed in 1776. In 1777 he obtained a prebend in the cathedral of Wells. He was a voluminous writer of tales, short poems, and sermons, which are little valued. A collection of his poems with a memoir of the author was published by his son in 1802, in 3 vols. 8vo.

**LANGLANDE, Langelande**, or **Longland, Robert**, the supposed author of the "Vision of Piers Ploughman," born at Cleobury Mortimer, Shropshire, in the first half of the 14th century. Nothing is known of him except from traditions current at least as early as the 16th century, according to which he was educated

at Oxford, and became a monk at Malvern. The familiarity of the author with the Scriptures and the church fathers indicates that he was an ecclesiastic; several local allusions in the poem, and the fact that its scene is the "Malverne hilles," prove that it was composed on the borders of Wales; and internal evidence fixes its date at about 1362. It narrates the dreams of Piers Ploughman, who, weary of the world, falls asleep beside a stream in a vale among the Malvern hills; and while satirizing in vigorous allegorical descriptions the corruptions in church and state, and the vices incident to the various professions of life, and painting the obstacles which resist the amelioration of mankind, it presents the simple ploughman as the embodiment of virtue and truth, and the representative of the Saviour. Its ancient popularity appears from the large number of MS. copies still extant, most of them belonging to the latter part of the 14th century. It was a favorite of religious and political reformers, and several imitations of it appeared, the most important of which was "Piers Ploughman's Crede," written about 1393 by some Wycliffite, assailing the clergy, and especially the monks. In 1550 the "Vision of Piers Ploughman" was printed by the reformers, and so favorably received that three editions were sold within a year; and the name of the ploughman is often introduced in the political tracts of the 16th and 17th centuries. This poem is a remarkable example of a system of verse derived from the Anglo-Saxons, and marked by a regular alliteration instead of rhyme. There are two classes of manuscripts, which give the text with considerable variations. The best edition both of the "Vision" and the "Creed" is that of Thomas Wright (2d ed., 2 vols., London, 1856), with notes, a glossary, and variations.

**LANGLES, Louis Mathieu**, a French orientalist, born near St. Didier, Aug. 23, 1763, died Jan. 28, 1824. He studied Arabic and Persian under Sylvestre de Sacy, and in 1787 published a French translation from the Persian of Tamerlane's "Political and Military Institutes," supposed to have been written by Tamerlane in the Mongol language. He was intrusted with the publication of the Mantchoo-French lexicon by Father Amiot, which he accomplished with accuracy and success. He induced the French republican government to establish the special school of oriental languages, which is still in existence. He was its first administrator, and professor of the Persian, Malay, and Mantchoo, but taught only the first of these languages. The geographical society of Paris was founded principally through his exertions. He published a great number of works relating to oriental literature, history, and geography, and by his enthusiasm and liberality contributed perhaps more than any other man of his time to the extension of oriental studies. But his learning was confused and inexact, and his works are of little authority.

**LANGLOIS, Jean Charles**, a French painter, born at Beaumont-en-Auge, July 22, 1789, died in Paris in 1870. He was in the army more than 40 years, till 1849, and exhibited panoramas of the principal battles he had witnessed, his "Capture of the Malakoff" especially attracting great attention. He published several military and other narratives.

**LANGLOIS, Victor**, a French orientalist, born in Dieppe, March 20, 1829, died May 14, 1869. He explored Cilicia and Little Armenia in 1852-'3, and the terra cotta figures which he had found in his excavations in the necropolis of Tarsus were exhibited in the Louvre. He discovered more than 80 new Greek inscriptions, and published the results of his researches in four works (1854-'61). In 1857 and in 1861 he went to Italy in search of historical data as to the relations between France and Armenia during the crusades. His other works relate to Egyptian and Georgian numismatics (1852), and to the convent of St. Lazarus and the Mekhitarist congregation, with an outline of Armenian history and literature (1862). In 1867 appeared his *Le mont Athos et ses monastères*, with a photolithographic reproduction of the geography of Ptolemy, of which the Greek manuscript of the 17th century is preserved in that monastery. The first volume of his *Collection des historiens anciens et modernes de l'Arménie*, a translation from the Armenian, was published in 1868, under the auspices of the Egyptian prime minister Nubar Pasha, but he did not live to complete the work.

**LANGRES**, a fortified town of Champagne, France, in the department of Haute-Marne, on the left bank of the Marne, 145 m. S. E. of Paris; pop. in 1866, 8,320. It has a communal college, a commercial court, and a theological seminary. The town is on a steep hill, belonging to the so-called plateau of Langres, and is the most elevated in northern France. The most important manufacture is cutlery. Langres has been the see of a bishop since the 3d century. It is the birthplace of Diderot, to whom a monument has been erected.

**LANGTOFT, Peter**, an English chronicler, so called from the parish of Langtoft in Yorkshire, flourished in the latter half of the 13th century and the commencement of the 14th. Little is known of his life beyond the fact that he was a canon regular of the order of St. Austin, and produced a translation from the Latin into French verse of Bosenham's "Life of Thomas à Becket," and a French metrical "Chronicle of England," from Trojan times to the end of the reign of Edward I. The manuscripts of the latter are preserved in the Cottonian collection in the British museum, and among the Arundel manuscripts in the same repository. The "Chronicle" was rendered into English verse by Robert de Brunne, whose version was edited by Hearne and published in 1725.

**LANGTON, Stephen**, an English prelate, born in Devonshire according to some authors, in



Sussex according to others, about 1160, died in Slindon, Sussex, July 9, 1228. He was educated at the university of Paris, where he had for a fellow student Innocent III., and eventually became canon of Notre Dame and chancellor of the university. Visiting Rome in 1206, he was made a cardinal by Innocent III., and in the succeeding year was consecrated by him archbishop of Canterbury, to which see he had been elected at the recommendation of the pope, and in opposition to the claims of John de Gray, whom King John had compelled the monks of Canterbury to elect. This circumstance gave rise to the quarrel between John and Innocent, one of the consequences of which was that Langton was kept out of his see until the submission of the king to the pope in 1213. In the same year he joined the confederacy of barons opposed to the misgovernment of John, and at a meeting of the heads of the revolt in London urged the restoration of the charter of Henry I. His name also stands first among the subscribing witnesses to Magna Charta. He adhered faithfully to his party throughout the struggle, and for his refusal to excommunicate the barons, at the command of Innocent, was suspended from the exercise of his archiepiscopal functions; but he was restored in February, 1216, and after the accession of Henry III., was allowed to resume the administration of his diocese. From that period he devoted his whole care to church discipline, and published a code of 42 canons in a synod at Oxford in 1222. He still continued to watch over the two charters with the attachment of a parent, and in 1223, at the call of the barons, again placed himself at their head to demand from Henry III. the confirmation of their liberties. His writings have perished; but to him is due the division of the Bible into chapters, since universally adopted.

**LANGUAGE** (Lat. *lingua*, tongue), in a general sense, any means of communicating thought. Man commonly accomplishes it through the organs of sight and hearing, and when these are impaired through the sense of touch. Visible speech is mainly that of gestures and of writing. Gestures are chiefly used by primitive races with whom language is but little developed, and by cultured people to converse with those who cannot hear. The scientific forms of unspoken language have been described in the articles **BLIND**, and **DEAF AND DUMB**. For the unsystematic and pictorial representations of thought, see **HIEROGLYPHICS**; and for the various graphic systems, see **WRITING**. This article treats of language only in the narrower and ordinary sense of oral or articulate speech, and specially of the results of the theoretical study of it. The character and functions of the organs of speech are discussed under **VOICE**.—Language is most commonly studied for practical purposes only, to gain greater assurance and accuracy in the use of one's vernacular, or to acquire the use of other tongues

which afford commercial, social, or literary advantages. The science of language, however, is not simply the study of a language or of languages. Though in a measure grounded on, and to a high degree aided by, a practical knowledge of languages, the science does not include the art of acquiring and imparting languages, to which the name of linguistics is properly confined. Hence it often happens that a great scholar in the science of language is not also a good linguist, or polyglot. There is another method of studying language which, in a narrower sense, does not come within the province of the science of language, namely, philology. In the narrower limitation of the term, as accepted by many recent writers, philology comprehends only scientific researches into the relations of anything expressed by language. The study of language is not its object, but simply a means. It uses language only as a key to the social, moral, intellectual, and religious history of mankind, as preserved in the literary monuments of given nations and ages. Thus classical philology inquires into the culture of Greece and Rome only; oriental philology investigates that of eastern peoples; Germanic philology studies the Germanic or Teutonic races; and so on. Philology, therefore, is thus not confined by the limits of purely linguistic investigation, and is in fact a historical discipline. Many scholars accordingly counsel the disuse of the term "comparative philology" as a designation for the science of language. The term "comparative grammar" is also considered inaccurate, as it indicates rather a division of the science of language. Thus linguistics, philology, and the science of language are conceived as three totally distinct sciences, though of necessity interdependent. Linguistics, as the practical study of languages, dead or living, cannot be treated here, but reference must be made to the numerous articles on the separate languages. Philology, conceived as the science of the culture of a given racial or historical division of mankind, is also too vast and varied for detailed treatment here; and its multifarious subjects of study must be consulted in the articles devoted to each.—The science of language inquires into the origin of language; into the laws of the development of one, or several, or all languages; into the reasons of the diversities or similarities of languages; into the causes of the grammatical and syntactical constructions peculiar to each; and into the relations which various languages hold to each other. The results attained in these classes of inquiries form therefore the subject and order of this article. The origin of language is still, as Prof. Whitney has expressed it, an uncontrollable subject, and other scholars regard it even as an insoluble problem. Many adhere to the belief that language was specially given by God, and hence that there was originally a single perfect language. Some hold that the statements of the Bible do not require such inference, and

maintain, like T. Hewitt Key in his "Language, its Origin and Development" (London, 1874), that "the Mosaic account expressly assigns the immediate invention to Adam." Steintal's objection to the theory of the divine origin of language, namely, that if language had been created in the first human beings, their children could not have gained possession of it, for the reason that what God gives to one as a special endowment no other is able to learn from him, is an argument beyond human reason either to accept or to refute. Benfey says (*Geschichte der Sprachwissenschaft*, &c., Munich, 1869) that the question of the origin of language lies beyond the province of the science of language, and belongs to the natural sciences. He argues that if these establish that mankind is not the offspring of a single human couple, it will be impossible to uphold the doctrine of the original unity of all human speech; and that if they prove that man could not have appeared upon earth otherwise than as a single couple, it will be impossible to establish the original diversity of speech, unless it be assumed that the first human beings were speechless. Many authorities now hold that man was originally speechless, and Jäger, Bleek, Schleicher, Fr. Müller, and others, have recently attempted to explain the origin of language after the Darwinian theory of development. The fact that at least nineteen twentieths of speech is demonstrably man's own work, has led Prof. Whitney to ask ("Language and the Study of Language," New York, 1867), "Why should the remaining twentieth be thought otherwise?" Those who consider language an art handed down and developed from generation to generation, and who hold that in retracing its history we must arrive at a generation which could not speak, nevertheless experience great difficulties in theorizing on the natural causes and the nature of the beginnings of language. The ancients held the theory that words were originally formed by imitations of natural sounds. They called this principle of coining words *onomatopœia*, word-making. (See Lersch, *Sprachphilosophie der Alten*, Bonn, 1838-'41.) It cannot be denied that every language has a stock of words which are imitations of sounds given out by certain things or animate beings. The cuckoo, the peewit, the whip-poor-will of North America, and the tuco-tuco of South America, are irresistible examples of this law. But, says Hewitt Key, here one is at once met by the objection that though such an origin is readily conceived in the case of giving names to living creatures, or to those acts which have their special noise, as scratching, thumping, hissing, yet how can provision be made for terms which belong to the other senses, as for example that of the eye, and still more for the conceptions of the mind? Such objections are not considered unanswerable. The noise *whirr* is believed to serve as a natural symbol of the idea of revolution, and thus the German has *wirren*, to twist, the French

*virer*, the English *veer*, and *to wear* (of a ship). The same sound forms an important part of *whirl*, *whorl*, *world* (the round globe), *warp*, *worm* in the double sense of the wriggling creature so called and the helix of a screw, and *wort* in the sense of root, as spiderwort. It is also heard in the initial letters of *writhe*, *wreath*, *wrench*, *wrest*, *wring*, *wrist*, *wriggle*, *wrap*, *wry*. Similar examples of the recurrence of natural sounds in numerous words expressive of abstract or concrete ideas, seemingly remote from the original ideas connected with such sounds, may be found in all known languages. Of course it is not maintained, as Blackie expressly says in his *Horæ Hellenicæ* (London, 1874), that all current words are to be explained on this principle alone. It is maintained only that the original stock of which language was made up consisted of such roots, and that a large proportion of them, after the changes of thousands of years, bear their origin distinctly on their face. Max Müller ridiculed this view of language, generally known as the mimetic theory, as "the bow-wow theory," without being able to disprove the justice of its application. In his "Lectures on the Science of Language" (London, 1863), he advocates another theory, namely, that man was endowed with a creative faculty which gave to various conceptions phonetic expressions, and hence that there were at first only a few roots of words expressive of general ideas, under which man classified his particular or special ideas, so that such class of words retains in all languages some phonetic type. This mystic doctrine of "phonetic types," first propounded by Heyse, to which for a time, after Max Müller's elaboration, great favor was shown, has now been generally discarded, and even by Max Müller himself. It is evident to every sober thinker, says Wilkins in the "Essays and Addresses by Professors and Lecturers of the Owens College, Manchester" (London, 1874), that the solution of the problem of the origin of language must reside "in some operation of the imitative principle, quickened in all probability by circumstances which we are able to a certain extent to reconstruct, and aided, at first very largely, but always in lessening measure, by the language of sign and gesture." The onomatopoeic or mimetic theory is greatly assisted by, or rather includes, the interjectional or exclamatory theory, elaborated by Wedgwood in his "Origin of Language" (London, 1866). For example, the interjection *fie!* *pfui!* is in all probability the physical effect of disgust at an offensive smell, which makes us close the passage of the nose and breathe strongly through the compressed lips—*faugh!* and hence the Icelandic *fui*, putridity, with the adjective *full*, foul, and our secondary adjective *fulsome*. It has been justly observed that a considerable number of the so-called interjections are but imperatives of verbs, often greatly abbreviated; nevertheless, it must be acknowledged that the mimetic and exclamatory theories

are as yet the only means attained of giving a rational account of the development of language. There remains, however, the difficulty of explaining how, prior to any knowledge of language, man was led to signify his conceptions by spoken words, and to devise such modifications for the purpose as to give rise to the same conceptions in the minds of others equally ignorant of language; but, as Farrar attempts to prove in his work "On the Origin of Language" (London, 1860), it would seem that man is led instinctively to the articulate reproduction of natural sounds, and that the conception that it was possible to express in sound the inward emotions arose from the felt significance of the instinctive and involuntary cries which are the germs of interjections. Similarly, says Bleek in his *Ueber den Ursprung der Sprache* (Weimar, 1868), the sounds of sensations and imitations are natural and involuntary utterances of emotions which are excited by the play of the organs. The lately deceased Lazarus Geiger, in his *Ursprung und Entwicklung der menschlichen Sprache und Vernunft* (Stuttgart, 1868 and 1872), a work of admirable learning and ingenuity, attempts to demonstrate that all words were developed from a single primitive form, analogous to the evolution of the organisms of animals and plants, and to the development of races and peoples. As German and Sanskrit, French and Italian, once formed a single language, and their diversities are due only to the prolonged separation of the peoples, he is led to believe that all the languages of the earth grew out of a single germ, and that the still greater diversities are owing only to more extended periods of separation. Without rejecting the proposition of the mimetic and exclamatory theories that man began to speak by imitating the sounds which he heard animate beings or inanimate objects produce, Geiger is of opinion that man was guided in the selection of utterances by that which he saw, or that he grouped every new sound under some other sound with which he was familiar. He further holds that the use of language in a measure preceded and produced reasoning, or at least that thought without language must have been different from the present mode of thinking by means of and with language. He arrives consequently at the conclusion that man could speak before he was in possession of tools and implements. The interdependence of thought and language, and the independence of the one from the other, have ever been subjects of philosophical discussion, but unproductive of positive results. Hence, linguistic scholars have many theories in regard to the measure and degree of such relationships. Prof. Whitney, for example, holds fast to his conclusion that thought is anterior to language, and independent of it, and that thought need not be internally or externally expressed in order to be thought. This, however, lies beyond the sphere of the science of language proper. Only the development of

language within more or less historical times, based on researches into the condition of real languages either of the present or the past, can admit of truly scientific study. — Etymology is the science of tracing the history of words, and of determining the laws according to which words change form and meaning in the history of a single language, or in a group of related languages, and if possible through all languages, back to the germinal words of the beginnings of speech. Languages change very rapidly. The language spoken in Rome about A. D. 1000 was widely different from the language of the ancient Romans or the modern Italians. The speech of the aborigines of Africa changes so rapidly that, according to the experience of missionaries, that of any particular tribe becomes entirely incomprehensible within a single generation. About 900 languages and 5,000 dialects are now known. The difficulty of deducing for all certain laws of growth and change is therefore apparent. In all languages words have been constructed by putting together previously existing forms of words. Thus, previous to the form *irrevocability*, there was *irrevocable*, which was preceded by *revocable*, which again was formed from *revoke* (Fr. *révoquer*, Latin *revocare*), which, with *evoke*, *invoke*, and *provoke*, was composed from the Latin verb *vocare*, to call, whose element is *voc*. All the suffixes and prefixes employed in the composition of these words have their own distinct meaning and office, and some of them formed at one time independent words. When the final element of a word, like *voc*, in Sanskrit *vak*, has been found, which is the case when a combination of letters has been reached which cannot be further stripped of formative parts, then the so-called root of a word has been obtained. Thus Chinese, though actually possessing about 40,000 words, has only about 450 roots; Hebrew and Sanskrit have about 500 roots; and probably no language has many more. Primary roots consist of only a vowel, as *i*, to go; or of a vowel and consonant, as *ed*, to eat; or of a consonant and vowel, as *du*, to give. Secondary roots have a vowel enclosed by two consonants, as *tud*, to push. Tertiary roots have two consonants followed by a vowel, or one vowel followed by two consonants, or first two consonants, then a vowel followed by another consonant, or two consonants, a vowel, and again two consonants; as *plu*, to flow; *ard*, to hurt; *spás*, to spy; *spand*, to tremble. Out of such simple and few roots not only the words of one but of numerous languages have been formed. Thus from the Sanskrit root *ar* comes the Latin *arare*, Greek *ἀροῦν*, Irish *ar*, Lithuanian *arti*, Russian *orati*, Gothic *arjan*, Anglo-Saxon *erjan*, English *ear* (the verb), and many other words in the same and other languages. Similar examples of the connection existing among the languages related to English and ancient Sanskrit, as well as the laws which seem to regulate the changes of sounds

within this group, have been given in the article GERMANIC RACES AND LANGUAGES. The roots of the Semitic languages (Hebrew, Chaldee, Aramaic, Arabic, and others) generally consist of three or more consonants. Chinese roots have generally but a single consonant followed by one or two vowels. Outside of the Indo-European languages little can be definitely established, as it is requisite, in order to attain positive etymological results, that not a single link in the historical connection between a language discussed and the ancient mother language should be wanting. Reimisch, in his work, *Der einheitliche Ursprung der Sprachen der alten Welt* (Vienna, 1873), has attempted to establish the intrinsic concatenation of the languages of central Africa, Ethiopia, Egypt, Arabia, Syria, and the Aryan family of speech; but there are still many gaps to be filled up to render the subject entirely clear. F. Lenormant's endeavors, in *Études accadiennes* (Paris, 1873 *et seq.*), and in *La magie chez les Chaldéens et les origines accadiennes* (1874), to develop Jules Oppert's opinion that at the basis of some of the oldest Semitic languages, as Elamitic and Assyrian, lie Finnic and Ugrian (or Turanian) strata of languages, are also far from conclusive. Hewitt Key, in his recent work mentioned above, has expressed the opinion that the Indo-European languages are closely connected with the speech of the Finns and Lapps; but this opinion also can hardly be considered substantiated. Nevertheless these works and similar ones, as Delitzsch's *Studien über die indogermanisch-semitische Wurzelverwandtschaft* (Leipzig, 1873), and Donner's *Vergleichendes Wörterbuch der Finnisch-Ugrischen Sprachen* (Helsingfors, 1874), indicate that many scholars perceive that the Indo-European, Semitic, and Turanian groups of languages may possibly have been derived from some one primitive form of speech. The opinions of Lazarus Geiger and other theorists on the origin of language may therefore be finally established by genuine etymological researches. But even if there is hope of an ultimate demonstration of the intrinsic oneness of all human speech, the difficulties still to be overcome are enormous. The phonetic changes which transform words of one language into almost unrecognizable sounds in another, somewhat distantly related, call for most searching examination of the conditions of speech in the various races. The laws of sound are circumscribed by physical conditions. Many languages are entirely devoid of certain sounds; thus the Chinese cannot produce many European utterances, saying Yamelika for America; and the aborigines of the Society islands say Tut instead of Cook. Friedrich von Schlegel asserts that the Aztec language has not the sounds of *b, d, f, g, r, s, j, v*; the Otomi lacks *f, i, k, l, r, s*; the Totonaka lacks *b, d, f, r*; the negroes have no *r*, the Australians no *s*; most Polynesian languages have no sibilants whatever, and others

have only seven consonants, which is the lowest number known. These imperfections and differentiations of the organs of speech render etymological researches exceedingly difficult. The usual alphabets of from 20 to 26 letters admit of the construction of many billions of words, and these letters are far from sufficient to represent the sounds of all languages. The hopelessness of ever building up the complete laws of the phonetic changes occurring in the almost 6,000 languages and dialects known, is further increased by the fact that our knowledge of human speech is confined to historic periods, and that the beginnings of language in prehistoric times, of which no monuments have come down to us, are highly essential to the construction of a satisfactory etymological system. On examining the savage languages now spoken, which many regard as counterparts of the forms of speech used in the childhood of mankind, it is found that the simplest sounds often signify the very opposite in other languages of the same degree of development. The sounds most easily produced, *ba, pa, ma*, and *da*, are generally expressions for father and mother; but what signifies father in one language, signifies mother in another; thus in Georgian *mama* is father, and *dada* mother; and in Tuluva, *amme* father, and *appe* mother. It has long been evident that the mere comparison of words would not be productive of satisfactory results. In fact, the day that Bopp first conceived the idea of bringing the test of the method of inflection to bear upon the question of the affinity and development of tongues, was the real birthday of the science of language.—Grammar is the scientific understanding and explanation of the sounds, forms, and functions of words and their parts, and of the construction of sentences. Comparative grammar seeks, by comparing the grammars of several languages, to reach the laws of inflection and construction common to them, and possibly to all languages. General or historic grammars attempt to explain the growth of language within a specified group of languages. When languages are analyzed in any state already reached, and not in a state of transition, they become the subject of special grammars, belonging to the province of linguistics. Comparative and historical grammars have almost exclusively been written on the Aryan or Indo-European family of speech, enumerated below. It is generally held that the genealogical relation and order of these languages has been demonstrated; and, though conjecturally only, yet with a tolerable degree of certainty, the extinct and primitive languages spoken by the races before separating into new branches have been reconstructed. Johannes Schmidt, in *Die Verwandtschaftsverhältnisse der indogermanischen Sprachen* (Weimar, 1872), objects to the idea of a genealogical tree of the Aryan or Indo-European languages, and proposes in its stead a kind of geographical basis of classification; saying: "You no sooner consign to the

realms of myths the so-called original languages constructed in modern times, such as the European, North-European, Slavo-Germanic, South-European, Græco-Italic or Italo-Celtic, than the mathematical certainty disappears, which was believed to have been already attained for the work of reconstructing the Indo-Germanic mother speech." It is true that there is still much need of argument and illustration to prove the genealogical relationship of the Aryan family of speech; and even August Fick, in *Die ehemalige Spracheinheit der Indogermanen Europas: eine sprachgeschichtliche Untersuchung* (Göttingen, 1873), seems, without sustaining all of Schmidt's premises, to be in favor of revising the order of the branches of the Indo-European tree of languages. Yet without adopting the theory of the concatenation of the Aryan languages, it is impossible to present a just idea of the nature, methods, and results of comparative philology or grammar, or the theoretical study of language. The whole group of those languages is supposed to come from a primitive language of monosyllabic structure; the reason being that all Aryan words can be reduced to roots of single syllables. Grammatically considered, there are two classes of roots: demonstrative or pronominal roots, ultimately indicative of position merely; and predicative or verbal roots, indicative of quality or action. Pronominal roots give rise primarily to demonstrative, personal, and interrogatory pronouns; secondarily to possessives and relatives, adverbs of position and direction, and several minor classes of words. Their number is about 15, all consisting either of a vowel only, or of a vowel preceded by a consonant. The predicative or verbal roots number several hundred, of various compositions of letters, but always forming a single syllable, and indicative of the properties, motions, sounds, &c., of natural objects. The combining of verbal with pronominal roots, for the sake of definiteness of expression, gradually developed various parts of speech. Singular, dual, and plural numbers were invented; prefixes of adverbial elements and repetitions of roots served to render verbal forms, which at first were neither past, present, nor future, but according to connection expressive of either, capable of indicating the various tenses. Interposition of vowels formed the moods, and modifications of roots, compositions with others, or extensions of pronominal endings, produced intensives, desideratives, causatives, and reflexives. Certain derivatives of verbal roots were used as nouns, which again received distinctive suffixes, capable of designating various relations, so-called case endings. On what principle the distinctions of gender were made (for in the oldest forms of language there are masculines, feminines, and neuters which do not depend on sex) is very obscure. In early language all words were either verbs or nouns. Adverbs and prepositions were generated by separating from verbs and nouns various in-

flexional suffixes which served to indicate the relations of time, place, &c. Conjunctions also came very late into existence; the definite articles came from demonstrative pronouns; the indefinite article from the numeral one; and interjections, which should be merely ejaculations without verbal significance, were increased in number by using abbreviated or corrupted words or phrases. The great cause of the varied appearances or pronunciations of words originally the same in the speech of several races, is love of ease in utterance. To economize efforts of voice, long words are abbreviated, and combinations of harsh or difficult sounds are rendered more agreeable and easy by omitting, inserting, or assimilating the letters, or by putting the accent back or forward, or by modifying the tone and length of vowels. The reasons for preferring one form to another are not always exactly definable, but as a rule the linguistic laws of phonetic alteration conform to the physical laws of articulation. The sense or ideas of proportion, rhythm, harmony, euphony, varying in nations of different degrees of culture, are also important factors in the mutations of language. One race abandons elements of speech highly valued by another, makes compounds which another abhors, and retains and adopts what others reject. Thus, while some languages of the Indo-European family continue to conjugate by changes of vowels and consonants, and by affixes, infixes, and suffixes, other languages indicate tenses, moods, and voices in a great measure by separate words. The same is observable in the declension of nouns. Then again words change meaning in the same language in the course of its development, and in passing from one language to another; new words are coined; other words are taken from foreign languages, and some of them are used in a sense they did not possess; others again obtain more than one meaning; some words of originally different significations become synonymous; and synonyms again become anonyms. The causes which produce in different ages and races these numerous significations of the same words, or of derivatives from the same root, have also been analyzed. Comparative grammar goes still further. Various languages have various modes of constructing sentences; words are placed in various relations to each other; they govern various cases; their order or sequence is changed; they combine into so-called idiomatic expressions, which if verbally translated into another language would often appear entirely void of meaning; and these often purely psychological causes have also been investigated. Yet even the grouping of languages into families of speech is far from being conclusive. A. W. von Schlegel proposes three divisions: languages without any grammatical structure, languages that make use of affixes, and inflectional languages. The last he considers superior to the others, and he calls them organic languages,



for the reason that, according to him, they contain a living principle of development and growth, and alone possess, so to speak, an abundant vegetation; in other words, they have the wonderful faculty of forming an endless variety of words, and of marking the connection of ideas which these words denote by means of an inconsiderable number of syllables, which separately considered have no significance, but which precisely define the meaning of the word to which they are attached. Friedrich von Schlegel, in the second place, contends for two main genera of languages, dividing them into those which express secondary ideas by an internal change of the root or inflection, and those which effect the same object by an added word which already in itself expresses the additional idea, whether of plurality, of past or future, or other relation. Bopp again demands three classes: first, monosyllabic languages, which are incapable of composition, and consequently without grammar and organism, as the Chinese; secondly, languages with monosyllabic roots admitting of composition, which are almost exclusively indebted to this power for their organic development or grammar; thirdly, languages with dissyllabic verbal roots, containing three essential consonants on which the fundamental meaning rests, as the Hebrew and Arabic. By many writers, Prichard for example, in his "Eastern Origin of the Keltic Nations" (London, 1831), and Duponceau to whom he refers, the idioms of the American tribes are called polysynthetic or polysyllabic, implying a marked difference from the so-called monosyllabic languages of S. E. Asia. Other writers define some languages as synthetic, as opposed to those which are analytic. Steinthal, in his *Charakteristik der hauptsächlichsten Typen des Sprachbaues* (Berlin, 1860), divides languages into two great classes, culture languages and uncultivated languages, each with the subdivisions, the isolating and the inflecting. Hewitt Key, after stating these distinctions, rightly remarks that all of them seem to be groundless. The assertion that Chinese has a peculiar monosyllabic character, and is devoid of grammatical formation, is founded on a gross error, as is shown in our article CHINA, LANGUAGE AND LITERATURE OF. The alleged distinction between word-building by addition of affixes, and word-building by means of inflection, does not exist. *Domini, domino, dominum* are thus said to be formed from *dominus* by an inflection of *us* into *i, o, um* respectively; but all four forms have proceeded from agglutination of what was a significant syllable in the first place, followed by a compression. Polysynthetic or polysyllabic, applied to the native American languages and the Basque, is an error similar to that committed in the case of Chinese. (See AMERICAN INDIANS, LANGUAGES OF THE.) To all appearance, groups of languages, though clearly and closely related, indicate more than a single type, and are not

surely to be derived from a single primitive tongue, excepting perhaps the languages spoken by the Caffres and Malays, and, but less probably, those of the Papuans and Australians. All other groups seem to be polyglottic, or derived from several root forms of speech in no manner related. It has therefore been attempted to attain a less objectionable classification by combining the results of linguistic and ethnological researches. We have given under ETHNOLOGY (vol. vi., p. 756) the latest classification of racial distinctions, which is equally supported by the relations apparently existing among the various forms of speech. We shall therefore elaborate the same table, with special reference to the labors of the distinguished linguist and ethnologist Friedrich Müller, as given in part in the account of the travels of the Austrian frigate Novara around the world (Vienna, 1868), and in part in the independent work entitled *Allgemeine Ethnographie* (Vienna, 1873). Not in all cases, as will be seen on comparison with the ethnological table, are the linguistic groups entirely the same, and the various subdivisions may be considered as breaks in the line of connection.

- I. Papuan languages. The languages spoken in Papua, by the aborigines of the Sunda islands, and in the Philippines.
- II. Hottentot languages. 1. Nama, Kora, Cape dialect. 2. Bushman tongues.
- III. Caffre or Bantu languages. 1. Eastern group. *a.* Kafir languages: Kafir, Zulu. *b.* Zambesi languages, spoken by the Barotse, Bayeye, and Mashona. *c.* Zanzibar languages: Kisuaheli, Kikamba, Kiuka, Kihia. 2. Central group. *a.* Setchuana (Sesuto, Serolong, Schlapi). *b.* Tsekeza, spoken by the Mankolosi, Matonga, and Mahloenga. 3. Western group. *a.* Banda, Herero, Londa. *b.* Congo, Mpongwe, Dikele, Isubu, and Fernando Po.
- IV. Negro languages. 1. Mandé languages: Mandingo, Bambara, Susu, Vei, Kono, Tere, Gbandi, Londero, Mende, Gbese, Toma, and Mano. 2. Volof language. 3. Felup languages: Felup, Fiham, Bola, Sarrar, Pape, Biáfada, Pajide, Bagé, Kallum, Temme, Bullom, Sherbro, and Kisi. 4. Bijogo. 5. Banyum. 6. Nalu. 7. Bulanda. 8. Limba. 9. Landoma. 10. Somhri. 11. Houssa. 12. Bornoo languages: Kanori, Teda, Munio, Nguuru, and Kanem. 13. Kru languages: Kru and Grebo. 14. Eva languages: Eva, Yoruba, Oji, and Akra. 15. Ibo languages: Ibo and Nupe. 16. Mbafo. 17. Mitchi. 18. Musgu languages: Batta, Musgu, and Logone. 19. Baghirimi. 20. Maba. 21. Nile languages: Bari, Dinka, Nuer, and Shilluk.
- V. Australian languages. 1. Northern division. 2. Southern division. *a.* Western group: languages spoken on the Swan river and King George's sound. *b.* Central group: the Parakalla languages on the Murray river and Encounter bay. *c.* Eastern group: languages near Lake Macquarie, Moreton bay, Kamilaroi, Viraturoi, Vailvun, Kokai, Pikumpul, Paiampa, Kingki, Turrupul, and Tippil. 3. Tasmanian languages.
- VI. Malayo-Polynesian languages. 1. Melanesian languages: language of the Feejee islands, Annatun, Eromangan, Tana, Mallikolo, Lifu, Baladea, Banro, Guadalcana, &c. 2. Polynesian languages. *a.* Samoa, Tonga, Maori, Tahitian, and Karotonga. *b.* Language of the Marquesas islands, and Hawaiian. 3. Malayan languages. *a.* Tagala group: 1, languages spoken on the Philippines—Tagala, Bisaya, Pampanga, Ilocana, and Bicol; 2, languages spoken on the Lardones; 3, Malagasi. 4. Language of Formosa. *b.* Malayo-Javanese group: Malayan, with several dialects, Javanese, Sunda, Madurese, Bughis, Mankasar, Alfuric, Batak, and Dayak.
- VII. Turanian or Mongolian languages. 1. Uralo-Altai languages. *a.* Samoyedic: Yurak, Tavgy, Ostiak-Samoyed, Yenisean, and Kamassin. *b.* Finnic: 1, Suomi and Laplandish; 2, Ostiak, Vogul, and Magyar; 3, Sirian and Votjak; 4, Teheremiss and Morvyn. *c.* Tartaric: 1, Yakut; 2, Turkish and Tchur

- vash; 3, Nogai and Kumuk; 4, Tehagata, Ulgur, and Turkmene; 5, Kirghiz. *d.* Mongolic: 1, eastern language; 2, western language (Kalmuck); 3, northern language (Buriat). *e.* Tungusic: 1, Mantchu; 2, Lamut; 3, Tchapogir. 2. Japanese. 3. Korean. 4. Monosyllabic languages (so named for convenience). *a.* Thibetic and Himalayan languages. *b.* Burmese, Rakhing, and the Lohita languages. *c.* Siamese, Khanti, Khassia, and the language of the Miao-tse. *d.* Anamese. *e.* Chinese: 1, Kwanhoo (dialect of Peking and Nanking); 2, Fukian; 3, Kwangtung (Punti and Hakka dialects). *f.* Isolated languages: Indo-Chinese languages, Talaing, and the languages of the Khamen, Tsiampa, and Kwanto.
- VIII. Language of the Arctic. 1. Yukagir. 2. Koriak, Tehuktehi. 3. Languages of Kamtchatka and of the Kurile islands (Aino). 4. Languages of the Yenisei-Ostiaks and Kotts. 5. Language of the Esquimaux. 6. Language of the Aleutians.
- IX. American languages. 1. Kenai languages. 2. Athabascan languages. *a.* Qualihouqua, Tlatkanai, Umpqua, and Hoopa. *b.* Language of the Apaches, Navajo, Lipans, &c. 3. Algonquin languages: Cree, Ottawa, Ojibway, Micmac, and Mohegan. 4. Iroquois languages: Onondaga, Seneca, Oneida, Cayuga, and Tuscarora. 5. Dakota language. 6. Pani. 7. Appalachee languages: Natchez, Muscogee, Choctaw, and Cherokee. 8. Languages on the N. W. coast: Koloshes and Nootka. 9. Oregon languages: Atna, Selish, Chinook, Calapooya, Wallawalla, and Sahaptin. 10. Californian languages: Cochimi and Pericu. 11. Yuma languages. 12. Isolated languages of Sonora and Texas: language of the Pueblos. 13. Isolated languages of Mexican aborigines. 14. Aztec languages: Mexican (Nahuatl) and Sonoga languages. 15. Maya languages: Maya and Huasteca. 16. Isolated languages of Central America and the Antilles. 17. Caribbean languages: Caribbean and Arrawakan. 18. Tupi languages: Tupi and Guarani. 19. Isolated languages of the Andes. 20. Araucanian. 21. Guaycuru-Abitonian. 22. Puelche. 23. Tehuelhetic. 24. Pesharar. 25. Chibcha. 26. Quichua languages: Quichua and Aymara.
- X. Dravidian languages. 1. Munda languages: language of the Kol, Ho, Santals, &c. 2. Dralaya languages: Tamil, Telugu, Tulu, Canarese, Malayalam, &c. 3. Cingalese (Elu).
- XI. Nubian languages. 1. Foolah languages: Futatoro, Foota-Jallon, Masena, Borgoo, and Sackatoo. 2. Nuba languages: Nubi, Dongolavi, Tumale, Koldagi, and Konjara.
- XII. Languages of the Mediterranean races. 1. Basque. 2. Caucasian languages. *a.* Lesghian, Avar, Kasikumuk. *b.* Circassian, Abkhasian. *c.* Kistie (Tush). *d.* Georgian, Lazish, Mingrelian, and Suanian. 3. Semitic languages. *a.* Hamitic languages: 1, Libyan group (Ta-Masheg); 2, Ethiopic group (Bedsha, Somaui, Dankali, Galla); 3, Egyptian group (ancient and modern Egyptian or Coptic). *b.* Semitic languages: 1, northern group—Chaldee, Syriac, Hebrew, Samaritan, Phenician; 2, southern group—Ethiopic, Tigre, Amharic, Hinyaritic, Arabic. 4. Aryan or Indo-European languages. *a.* Indian group: 1, old Indie (Sanskrit), Pali, Prakrit; 2, modern Indian languages—Bengali, Assami, Oriya, Nepaulose, Cashmerian, Sindhi, Punjabi, Hindustani, Gujarati, Marathi; 3, language of the Sijaposh, Dardu tribes, and gypsies. *b.* Iranian group: 1, old Persian, Pehlvi, Parsi, modern Persian and its dialects, Kurdish, Beluchi; 2, Zend, Afghan; 3, Osetian; 4, Armenian. *c.* Celtic group: Welsh, Gaelic. *d.* Italic group: Etruscan (?), Umbrie, Oscan, Latin, and the Romance languages (Italian, Spanish, Portuguese, French, Rhaeto-Romanic, Rouman). *e.* Thracio-Ilyrian group: Albanese. *f.* Greek group: ancient and modern Greek. *g.* Letto-Slavic group: 1, Slavic languages—old Slavic, Bulgarian, Serb, Slovenish, Russian, Polish, Polabie, Bohemian; 2, old Prussian languages—Lithuanian, Lettish. *h.* Germanic languages: Gothic, High German, Low German, Anglo-Saxon, English, Frisian, Flemish, Dutch, Icelandic, Swedish, and Danish.

**LANGUEDOC**, an ancient province of southern France, bounded N. by Lyonnais, E. by Dauphiny and Provence, from which it was separated by the Rhône, S. E. by the Mediterranean, S. by Roussillon and Foix, W. by Gascony and Guienne, and N. W. by Auvergne. It was distinguished into Languedoc proper,

comprising Haut-Languedoc, Bas-Languedoc, and the Cévennes, and the annexed provinces, Vivarais, Velay, Gevaudan, Albigeois, and part of Quercy. It nearly corresponds to the Gallia Narbonnensis of the Romans. The Visigoths took possession of it in the 5th century, calling it the kingdom of Gothia, and in the 8th it was occupied by the Saracens, who were expelled by Charles Martel and Pépin the Short. Charlemagne made of it the duchy of Septimania, the rulers of which made themselves independent; and in the 10th century it became the county of Toulouse. A part of it was ceded to the French crown in 1229, and the province was definitely united with France in 1271. The parliament sat at Toulouse, and the assembly of notables at Montpellier. The name Languedoc was formed from *langue d'oc*, *oc* being the word used by the inhabitants for *oui*, and distinguishing them from those N. of the Loire, who used *oil* (*langue d'oil*). It now forms the departments of Aude, Tarn, Hérault, Lozère, Ardèche, and Gard, and parts of Haute-Garonne and Haute-Loire.

**LANIGAN, John**, an Irish clergyman, born in Cashel in 1758, died at Finglas, near Dublin, July 7, 1828. About the age of 16 he entered the Irish college at Rome, where he took orders and received the degree of D. D. He was soon afterward appointed to the chair of Hebrew, divinity, and the Scriptures at Pavia; and when the university was deserted in 1796 in consequence of the war, he returned to Ireland and was elected to a similar position in the college of Maynooth. His election having been opposed by the bishop of Cork, who suspected him of Gallicanism, he refused the professorship, and obtained an appointment in the record tower of Dublin castle, to which were added in 1799 the duties of librarian, editor, and translator for the Dublin society. This place he retained till 1821, when his intellect became impaired, and he passed the rest of his life in a private lunatic asylum at Finglas. He left an "Introduction concerning the Nature, Present State, and True Interests of the Church of England, and on the Means of effecting a Reconciliation of the Churches," and an "Ecclesiastical History of Ireland" (4 vols., 1822). He also published the Roman breviary in Irish, and an edition of Alban Butler's "Moral Discourses," with a preface.

**LANJUINAIS, Jean Denis**, count, a French statesman, born in Rennes, March 12, 1753, died in Paris, Jan. 13, 1827. When scarcely 22 years of age he won by public competition the professorship of ecclesiastical law in his native city. He acquired reputation as a lecturer and a barrister, was in 1789 elected a deputy to the states general, took an active part in nearly all the great measures of the constituent assembly, framed the bill for the civil constitution of the French clergy, and was the first mover of a plan afterward adopted and embodied in the civil code, by which the registration of births, marriages, and deaths was to

be transferred from ecclesiastics to municipal officers. In 1792, being sent to the convention, he resisted the extreme measures of the revolutionists, and opposed the proceedings against Louis XVI., and, being obliged to participate in the trial, voted for his confinement and subsequent banishment. He sided with the Girondists, and was arrested on June 2, 1793, but escaped to Rennes. He resumed his seat as a deputy in 1795, and became president of the convention. On the organization of the directory he was elected to the council of the ancients by 73 departments. After the 18th Brumaire he was appointed a member of the senate, opposed the consulate for life and the establishment of the empire, received nevertheless the title of count from Napoleon, and was one of the members who voted for the deposition of the emperor in 1814. He was made a peer by Louis XVIII., submitted to Napoleon when he returned from Elba, presided over the chamber of deputies during the hundred days, and on the second restoration resumed his seat in the chamber of peers. Here he advocated liberal opinions, opposing the reactionary measures of the Villèle ministry and the growing influence of the clergy. He was acquainted with the oriental languages, entered the academy of inscriptions in 1808, became afterward a member of the Asiatic society of Paris, and was elected associate of the philosophical society of Philadelphia. His works have been published in 4 vols. 8vo (Paris, 1832).

**LANKESTER, Edwin**, an English physician, born at Melton, April 23, 1814, died in October, 1874. He studied in London and at Heidelberg, and was lecturer and professor at prominent institutions from 1843 to 1862, when he became coroner for central Middlesex. His works, besides numerous contributions to scientific periodicals and cyclopædias, include "Vegetable Physiology" (1868), "A School Manual of Health" (1869), and "What shall we Teach? or Physiology in Schools" (1870). He edited in 1866 the "Journal of Social Science."

**LANNER.** See FALCON.

**LANNES, Jean**, duke of Montebello, a marshal of France, born at Lectoure, Guienne, April 11, 1769, died in Vienna, May 31, 1809. He was apprenticed at 15 years of age to a dyer, but in 1792 entered the army, and soon attained the rank of *chef de brigade*. In 1795 he was included among the officers whom the report of the committee charged with reorganizing the army recommended to be dropped from the service; but disdaining an inactive life, he followed Bonaparte to Italy in 1796 as a volunteer, and distinguished himself at Millesimo, at Fombio, at the bridge of Lodi, and at the assault of Pavia, and was made a brigadier general. At the beginning of the battle of Arcole, Nov. 15, he was wounded; but learning that the combat had been renewed before the bridge, he mounted his horse, and plunging into the thickest of the fight was struck senseless by a

ball while urging on the troops. In two months he was again in the field, and participated in some of the most important achievements of the campaign of 1797. He followed Bonaparte to Egypt in 1798, and fought with distinction at Gaza, Jaffa, St. Jean d'Acre, and Aboukir. At the last named place he was severely wounded while storming a redoubt. Returning to France, he contributed greatly to the success of the 18th Brumaire, and received the command of the consular guard; and in the spring of 1800 he took command of the advanced guard of the army with which Napoleon entered Italy over the St. Bernard, and he ended a series of brilliant achievements by completely defeating the Austrians at Montebello, whence he subsequently received his ducal title. At Marengo he sustained for seven hours the attacks of the Austrian army supported by a powerful train of artillery, and was presented with a sword and selected to present to the French government the standards taken from the Austrians. In 1801 he was sent to Lisbon as minister plenipotentiary, but showed in this capacity so arbitrary and rapacious a disposition and so little of diplomatic finesse, that he was recalled. In 1804 he was created a marshal of the empire, and in 1805 accompanied Napoleon to the Austrian campaign. He was present at Wertingen, Ulm, and Braunau, and occupied Linz; and at Austerlitz he had two aides killed by his side. He was actively employed in the campaign of 1806 against the Prussians, and at the battle of Jena commanded the centre. He subsequently participated in the campaign against the Russians, terminating at the battle of Friedland, June 14, 1807. In 1808 he accompanied the emperor into Spain, and, having defeated Castaños and Palafox at Tudela, conducted the siege of Saragossa, which after a protracted defence, memorable alike for the heroic endurance of the inhabitants and the energy and skill of the French marshal, capitulated Feb. 21, 1809. He was almost immediately summoned to Germany, where the campaign of 1809 had already commenced. At Eckmühl, April 22, his services mainly contributed to the successful issue of the battle; and at the assault on Ratisbon on the succeeding day he signaled himself by one of those daring acts for which he was conspicuous even among Napoleon's generals. Seeing that his men hesitated to enter the breach under a heavy fire from the ramparts, he seized a scaling ladder and led them in through a storm of shot, thereby carrying the place in a few minutes. The sanguinary battles of Aspern and Essling, May 21 and 22, witnessed the termination of his career. On the 21st he held the village of Essling against the repeated attacks of the Austrians. On the succeeding day he led an immense column of infantry, artillery, and cavalry against the Austrian centre, but was forced back toward the bridge connecting the left bank of the Danube with the island of Lobau, whither the

French were soon in full retreat. To animate his men, he dismounted, and stationed himself in the front ranks. At that moment a cannon ball carried away his right leg, and the foot and ankle of his left. As he was borne from the field, he encountered the emperor, who, kneeling by his litter, embraced him with tears, and showed an unusual degree of emotion. After nine days he expired in Vienna, whither he had been removed soon after the battle. A statue of Lannes was erected in his native place after the revolution of July, 1830.—His son, NAPOLÉON LANNES DE MONTEBELLO, duke, born July 30, 1801, was made a peer by Louis XVIII., but took his seat only after the accession of Louis Philippe, who employed him in the diplomatic service. In 1847-'8 he was minister of marine. In 1849 he was elected to the legislative assembly, in 1858 sent as ambassador to Russia, and in 1864 made a senator. He died July 20, 1874.

**LA NOUE, François de**, a French soldier, born near Nantes in 1531, died near Lamballe, Aug. 4, 1591. He belonged to an illustrious family of Brittany, was converted to the reformed religion by D'Andelot, a brother of Coligni, and became one of the most valiant soldiers of the Huguenot army under Condé, distinguishing himself at Dreux, Orleans, and Poitiers, and being captured for the second time at Moncontour (1569). The cardinal de Lorraine declined to exchange him for Strozzi, remarking that they had a number of Strozzi, but that the Protestants had only one La Noue. He was however soon released. At the siege of Fontenay-le-Comte, in 1570, he lost his left arm, which was replaced by one of iron, whence his sobriquet of *bras de fer*. He took Valenciennes in 1571, but was obliged to capitulate at Mons in the following year. After a futile attempt to negotiate with the inhabitants of La Rochelle in behalf of Charles IX., he was during four years at the head of the Protestant army. On the restoration of peace he went to Flanders (1578) as grand field marshal in the service of the Low Countries, where after various successes he was captured by the Spaniards and held a prisoner five years. In 1585 he was exchanged for Philippe Egmont, on condition that his son should remain as a hostage in the custody of the duke of Lorraine. Subsequently he distinguished himself by fresh exploits under Henry IV., who exclaimed, on hearing that La Noue had died of wounds received at the siege of Lamballe, that France had lost in him not only a great warrior, but a man who was still greater by his virtues and humanity; and even a Roman Catholic historian compared him to the chevalier Bayard. He occupied an eminent place in French literature, as one of the finest prose writers of his day. His principal work, *Discours politiques et militaires* (Basel, 1587), has passed through many editions, and been translated into German and English. His correspondence was edited by Kervyn de Volkaersbeke (Ghent and Paris, 1854).

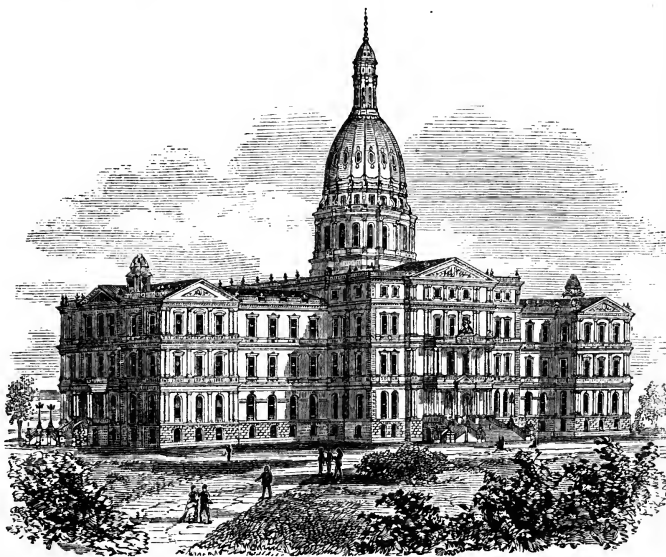
**LANSAC, François Émile**, a French painter, born at Tulle in 1805. He studied under Langlois and Ary Scheffer, and excels in painting horses and equestrian pictures. His "Olivier de Clisson" and "Napoleon I." are at Versailles. His other principal works are "Horses at Liberty" and "English Terrier" (1857), "The Death of Ravenswood" (1861), "Charles II." (1864), "The Broken Girth" (1868), and "A Russian Team" (1869).

**LANSDOWNE. I. William Petty**, first marquiss of, better known as the earl of Shelburne, a British statesman, born May 2, 1737, died May 2, 1805. In early life he entered the army, and served with distinction under Prince Ferdinand in the seven years' war. Upon the death of his father in 1761, he took his seat in the house of lords; and upon the formation of the Grenville ministry in April, 1763, he was appointed president of the board of trade, with a seat in the cabinet, although he was not then 26 years of age. In this capacity he distinguished himself by a conciliatory policy toward America, and by his opposition to the plans proposed for taxing the colonies, thereby incurring the hostility of the king and of his colleagues. Upon the remodelling of the cabinet in September he resigned office, and thenceforth attached himself to the policy and fortunes of Mr. Pitt, who, upon assuming the reins of government in 1766, made him secretary of state for the southern department, which included the colonies. He here renewed his endeavors to remove all causes of complaint between the colonies and the mother country, but was constantly thwarted by Townshend, the duke of Grafton, and others of his colleagues, who during the illness of Pitt, now become earl of Chatham, had acquired a predominating influence in the cabinet. Not choosing to resign until he could advise with Chatham, he was dismissed by the king in October, 1768; and thenceforth, during the Grafton and North administrations, he proved himself one of the ablest and most active opponents of the ministry in the upper house. Upon the resignation of Lord North in March, 1782, he took office under the marquiss of Rockingham; and upon the death of the latter in July of that year he was intrusted by the king with the formation of a new ministry. The new premier had to encounter the opposition of the Fox party, who were disappointed that the duke of Portland had not received office; and the coalition between these and the adherents of Lord North compelled him to resign in February, 1783. But during the seven months that he held office the defence of Gibraltar and the victories of Hood and Rodney added lustre to the British arms; and the preliminaries for peace with America and for the acknowledgment of the independence of the United States were concluded, notwithstanding he had joined Lord Chatham in expressing the strongest disapprobation of the latter measure. From this period he withdrew almost wholly from public life. In 1784 he was

created marquis of Lansdowne. Lord Shelburne was considered one of the most liberal and accomplished statesmen of his time, and probably carried out more fully than any of his contemporaries the principles inculcated by the elder Pitt. **II. Henry Petty-Fitzmaurice**, third marquis of, second son of the preceding, born July 2, 1780, died Jan. 31, 1863. He was educated at Westminster, Edinburgh, and Trinity college, Cambridge, where he graduated in 1801. Upon coming of age, being then known as Lord Henry Petty, he entered parliament for the borough of Calne, succeeded to the representation of Cambridge university on the death of Mr. Pitt, and under Grenville and Fox (1806-'7) was chancellor of the exchequer. He supported the leading measures of the liberal party, but retired with his colleagues in 1807; and succeeding to his title two years later, on the demise of his brother, he became one of the whig leaders in the house of lords. He was an earnest advocate of Catholic emancipation and the abolition of slavery, and was one of the first to urge the necessity of parliamentary reform and free trade. After 20 years' exclusion from a participation in the administration of public affairs, he was in 1827 home secretary both under Canning and in the short-lived cabinet of Viscount Goderich; was president of the council in Earl Grey's ministry from November, 1830, till November, 1834, and in Melbourne's from April, 1835, till September, 1841. He accepted the same office again under Lord John Russell's administration in July, 1846, and held it till February, 1852. Upon the formation of the Aberdeen cabinet in the succeeding December he accepted a seat in the cabinet without office, which he occupied till February, 1858, when he retired from public life.

**LANSING**, a city and the capital of Michigan, in Ingham co., on Grand river, here spanned by an iron and two wooden bridges, 85 m. N. W. of Detroit; lat.  $42^{\circ} 46' 28''$  N., lon.  $84^{\circ} 32' 40''$  W.; pop. in 1850, 1,229; in 1860, 3,074; in 1870, 5,241; in 1874, 7,442. It is regularly laid out, with wide streets crossing each other at right angles and lighted with gas. The state house is a large, plain frame building, mostly erected in 1849; a three-story brick structure, for the temporary accommodation of some of the state officers, was built in 1871. A new state house,

to be completed in 1877, at a cost of \$1,200,000, is in course of construction. This edifice is to be of iron and stone, in the Palladian style of architecture, four stories high, with basement, 345 ft. in length, not including the porticos, and 191 ft. deep. The state reform school occupies a farm of 139 acres in the E. part of the city, and has about 200 inmates. It has four brick buildings, the central one being 48 ft. long, 56 ft. deep, and four stories high, with two wings extending north and south, each 95 ft. long, 33 ft. deep, and three stories high, and a third extending east, 83 ft. long, 30 ft. deep, and three stories high. The state agricultural college occupies a farm of 676 acres, 3 m. E. of the city limits. The buildings, four in number, stand upon a slight eminence amid forest trees; the grounds immediately around have been handsomely laid out. It was chartered in



New State Capitol at Lansing, Michigan.

1855, and subsequently received the congressional land grant to the state for an agricultural college. The number of students in 1873 was 143. The odd fellows' institute, for the care and education of orphans of the order, in the N. W. extremity of the city, was organized in 1871. It occupies a tract of 45 acres and a brick building (since enlarged) formerly used as a female college, and has a library of 1,500 volumes. At the mouth of Cedar river in the southern portion of the city is an artesian well, yielding mineral water of medicinal properties. Lansing is well supplied with railroads, four lines centering here, viz.: the Jackson, Lansing, and Saginaw; Detroit, Lansing, and Lake Michigan; Peninsular; and Lake Shore and Michigan Southern. It is surrounded by a fertile country, abounding in timber and coal, and has an important and in-



creasing trade. The river affords water power, which has as yet been but little utilized. The principal manufactories are three of sash, doors, and blinds, two of chairs, one of spokes, felloes, and bent work, two of barrels, three of iron work, including agricultural implements, sewing machines, and steam engines, several saw mills, a flouring mill, and a woollen mill. There are two national banks with a capital of \$175,000, and an insurance company with \$100,000 capital. The public schools are graded, including a high school department, and in 1873 had 27 teachers and 1,050 pupils. The Michigan homeopathic college, open to both sexes, is situated here. The state library has more than 20,000 volumes, the public school library about 500, and that of the Lansing library and literary association about 1,000. Two weekly newspapers are published, and there are 15 churches, viz.: Baptist, Congregational, Episcopal, Freewill Baptist, Lutheran, German Evangelical Lutheran, Methodist (5), Presbyterian (2), Roman Catholic, and Universalist.—Lansing was made the seat of government in 1847, when its settlement was barely begun, and was incorporated as a city in 1859.

**LANSINGBURGH**, a village of Rensselaer co., New York, on the E. bank of the Hudson river, opposite the mouth of the Mohawk, and joining Troy on the south; pop. in 1870, 6,372. It has communication with Troy by the Troy and Boston railroad and by horse cars, and by the latter with Waterford, 1 m. N. on the other side of the river. It is handsomely laid out, with streets crossing each other at right angles and shaded with trees, and has an excellent fire department. Besides a large number of brush factories, for which Lansingburgh is particularly noted, there are two manufactories of oil cloth, one of valves, two of crackers, and one of knit goods. It has a national bank, five hotels, three public schools, a female seminary, a Roman Catholic school, a weekly newspaper, and seven churches.

**LANTERN FLY.** See **FIREFLY**.

**LANTHANUM**, or **Lanthanum** (Gr. *λανθάνειν*, to lie hid), a metal discovered in 1841 by Mosander, who then separated it from the metal didymium, with which it was associated together with cerium in the mineral cerite; symbol, La; chemical equivalent, 92. It forms only one oxide, which is buff-colored and freely soluble in diluted nitric acid. It forms colorless astringent salts, which give a white precipitate with the soluble oxalates.

**LANUVIUM** (now *Cività Lavigna*), an ancient city of Italy, in Latium, 18 m. S. S. E. of Rome, about a mile from the Appian way. It was founded at a very remote period, and probably by a colony from Alba. It took part with Rome against the Volscians, but later, in the wars of the Latins, against the Romans. Subsequently it was celebrated for its temple of Juno Sospita. It suffered greatly in the civil wars. The emperor Antoninus Pius was born here. Few remains of the old city now exist.

**LANZA, Giovanni**, an Italian statesman, born at Vignale, Piedmont, in 1815. He became a member of the Sardinian chamber in 1848, and of Cavour's cabinet as minister of education in 1855, and of finance in 1858. He withdrew with Cavour in 1859, and was repeatedly president of the Sardinian chamber and the Italian parliament. In 1864-'5 he was minister of the interior under Lamarmora, and he executed the transfer of the capital of Italy to Florence. In 1867 he was again president of the parliament, but resigned in consequence of his objections to the financial measures of the government. His reelection to the presidency in 1869 occasioned the resignation of the Menabrea cabinet, and the king called upon him to form a new one, in which he took the portfolio of the interior. The transfer of the capital to Rome, July 1, 1871, took place under his administration, and he projected beneficial financial measures. His cabinet, resigning June 26, 1873, was succeeded, after a protracted crisis, by that of Minghetti.

**LANZAROTE**, the most N. E. of the Canary islands, in lat. 29° 2' N., lon. 13° 48' W., 90 m. from the African coast; length 36 m., average breadth 9 m.; area, about 325 sq. m.; pop. in 1867, 17,500. The mountains are all of volcanic origin, and the principal peak, *Montana Blanca*, is upward of 2,000 ft. high; the most conspicuous of the active volcanoes is *Temanfay*. Small rocky islands abound on the N. E. and E. coast. The decomposed lava which composes the soil of the low hills and large plains makes it exceedingly fertile in rainy years, but the generally prevailing drought is often fatal to vegetation. In good years the product of wine amounts to 1,500 pipes. The other staple articles are various cereals. *Teguise* is the residence of the governor, and *Arecife* is the principal port, free since 1852. The total value of imports in 1872 was £22,614, and 83 vessels entered and cleared, tonnage 16,947. The exports to England amounted to £12,585.

**LANZI, Luigi**, an Italian author, born at Monte dell'Almo, near Fermo, June 14, 1732, died in Florence, March 30, 1810. He was educated by his father and at the Jesuit college in Fermo. He entered the order in 1749, and taught in their schools. After studying theology at Rome for four years, he was professor of the humanities in several colleges. Upon the suppression of the Jesuits in 1773, he was appointed assistant director of the gallery of Florence. He studied the Etruscan language and antiquities, making several journeys to collect materials. In 1790 he was appointed archæologist of the grand duke, in consequence of his *Saggio di lingua etrusca*. He now devoted himself altogether to archæological and artistic researches. Toward the close of his life he wrote several devotional books. His most important works are: *Descrizione della galleria di Firenze* (Pisa, 1782); *Saggio di lingua etrusca* (Rome, 1789); and *Storia pittorica della Italia* (6 vols., Florence, 1792), a work

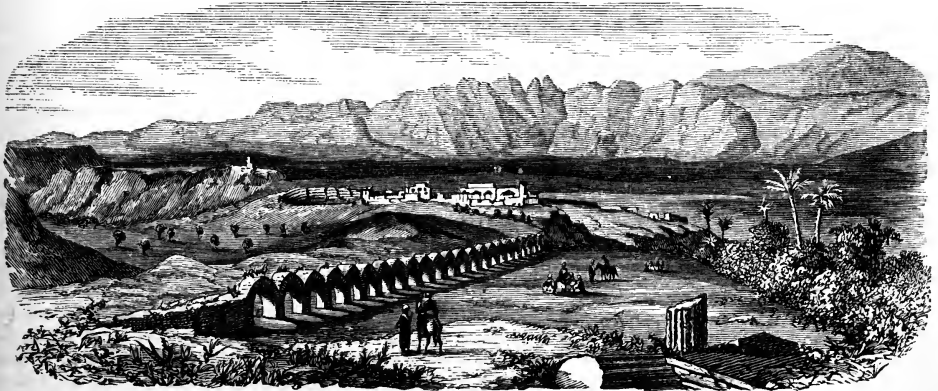
which he undertook at the suggestion of Tiraboschi, the historian of Italian literature. No general history of Italian painting had previously appeared, and the histories of particular schools were too strongly marked by bias and prejudice to be of any general value. Lanzi's work was the first comprehensive treatise in which the history of each school is given according to its several epochs, and the first written in a philosophical and impartial spirit. Several editions were published in the author's lifetime, each of which received numerous additions and revisions from his hand. It has been translated into various languages, and is familiar to English readers through the excellent version of Thomas Roscoe, which forms 3 vols. of Bohn's "Standard Library." Lanzi also published a collection of dissertations on Etruscan vases; a book of Latin poems written by himself; a treatise on the ancient Italic languages; a translation of Hesiod's "Works and Days" in *terza rima*; and *Opere sacre*, a series of treatises on spiritual subjects, to which he is said to have attached more importance than to any of his other writings.

**LAOCOÖN**, a Trojan hero, generally represented as the son of Antenor, and a priest of Apollo or Neptune. While the Trojans were assembled round the wooden horse of the Greeks, deliberating whether they should admit it into their city, Laocoön rushed forward, warned them not to receive it, and struck his spear into its side. As a punishment for his impiety toward an object consecrated to Minerva, two monstrous serpents attacked him

and his two sons while preparing to sacrifice in the temple of Neptune, and, coiling themselves round the bodies of the three, crushed them to death. This legend was a favorite subject with the poets and artists of ancient Greece. The story is related by Virgil, and a celebrated group of sculpture representing Laocoön and his sons encoiled by the serpents, and suffering the agonies of strangulation, is still extant, and is said by Pliny to have been the work of the Rhodian statuary, Agesander, Polydorus, and Athenodorus. It was discovered at Rome in 1506, and purchased by Pope Julius II., who placed it in the Vatican, where it still remains. The Laocoön group has been made the subject of admirable art criticism by both Winckelmann and Lessing; by the latter in the celebrated work on art entitled *Laokoön*.

**LAODAMIA**, a mythical Grecian princess, daughter of Acastus and wife of Protesilaus, a Thessalian hero, who, having led his warriors against Troy, was the first Greek slain on the Asian shore. His disconsolate spouse entreated the gods to permit her to hold converse with her husband for only three hours. The request was granted, and Mercury conducted Protesilaus back to the upper world; but when he was forced to return, Laodamia, unable to endure separation from him, expired. The legend is embodied in one of Wordsworth's finest poems.

**LAODICEA**, in ancient geography, the name of six Greek cities in Asia, situated in Phrygia, Syria, Lycaonia, Coelesyria, Media, and Mesopotamia, founded by Seleucus Nicator, the first king of Syria, and some of his successors.



Ruins of Laodicea.

Two deserve particular notice. **I. Laodicea on the Lyens**, a tributary of the Mæander in the S. W. corner of Phrygia, which, however, was claimed by some earlier writers as part of Lydia and Caria. It received its name from Laodice, the queen of Antiochus Theos, its founder. It passed from the kings of Syria to those of Pergamus, and under the Romans, though frequently visited by destructive earthquakes, became one of the most flourishing and

opulent cities of Asia Minor. It was destroyed in 1402 by Tamerlane. Its luxury in the early times of Christianity is attested by the severe rebuke addressed to its inhabitants in the Apocalypse. Paul addressed an epistle to the Christians of Laodicea. (See **EPHESIANS, EPISTLE TO THE**.) The town of Eski-Hissar was built by the Turks on its site. **II. Laodicea on the Seacoast**, a maritime city of Syria, 50 m. S. by W. of Antioch, founded by Seleu-

ous Nicator, and named after his mother. It was renowned for the fertility of its wine-growing environs, its splendor, and the excellence of its harbor. In the later period of the Syrian empire it became almost independent, and it suffered greatly during the civil war after the death of Cæsar, when it stood a siege against the Cassians. It was rewarded by Antony with exemption from taxes, and adorned by Herod the Great with an aqueduct, the ruins of which, with other remnants of its ancient greatness, are still to be seen. During the middle ages it suffered from the attacks of the Moslems. Its site is now occupied by the Turkish city of Latakia. (See LATAKIA.)

**LAOMEDON.** See TROY.

**LAON** (anc. *Lugdunum Clavatum*, and *Bibrax Suessorum*; mediæval Lat. *Laudunum*), a fortified city of France, capital of the department of Aisne, 74 m. N. E. of Paris; pop. in 1872, 10,268. It is mainly built on a steep isolated hill shaped like a V, and thought by many to be the Mons Bibrax mentioned by Cæsar. On one arm of the V stand the modern citadel and the city proper enclosed by old fortifications; on the other is a Jesuit residence, the remaining portion of the once magnificent monastery of St. Vincent. Of the populous suburbs which once extended all round the foot of the mountain, only two small villages now remain. The cathedral was burned about 1112, and rebuilt in 1114. It formerly had six towers and a central dome over the transept, of which only the two western towers and one at the S. E. angle of the transept remain entire. The western front has recently been restored at an expense of 2,000,000 francs. Of the four other churches within the walls, two are also of the 12th century, one being a church of the knights templars. The city has a library of 20,000 volumes, with a collection of more than 2,000 rare autographs, a museum filled with Gallo-Roman and Celtic antiquities, a communal college, and a normal school. It is an emporium for the manufactures of St. Quentin, St. Gobain, and Follenbray; and has an active trade in nails, hats, woollen stuffs, and hosiery, besides corn, white poppy oil, and garden stuffs. In the suburbs are thriving potteries, tan yards, lime kilns, rope walks, and a manufactory of coppers. —Laon became the residence of Queen Brunehaut in 575, and the French kings frequently resided there till the accession of the house of Capet in 987. It has a famous school, in which Anselm of Canterbury and Abélard taught for some time. During the middle ages the burgesses maintained a long and bloody struggle for communal rights with the bishop and chapter. Since the time of Cæsar Laon has sustained many sieges. It held out against Henry IV. in 1590, but was taken by him in 1594; was alternately occupied by the allies and Napoleon in 1814 and 1815, its environs being the scene of important engagements in

March of the former year (see BLÜCHER, vol. ii, pp. 755-'6); and on Sept. 9, 1870, capitulated to the Germans. On the last occasion, just as the German troops were marching in, a French soldier blew up the powder magazine, killing and wounding several hundred persons.

**LAOS**, a country of Asia, in Indo-China or Further India, bounded by China, Anam, Siam, and Burmah, and extending from about lat. 16° to 23° N., though its limits are not closely defined; pop. estimated at about 1,500,000. It is traversed by the Mekong or Cambodia river, and is separated from Burmah by the Salwen. The surface appears to be a valley lying between two nearly parallel ranges which run along the N. E. and S. W. frontiers. The soil is fertile, and produces rice, tobacco, the sugar cane, indigo, benzoin, gums, teak, sapan and sandal woods, betel, and numerous fruits. Elephants and draught cattle are the principal animals, and valuable mines of tin and iron are said to exist, while gold is washed from the sands of the rivers, and copper, lead, emeralds, and rubies are also found. The Laos are an honest but indolent race, much addicted to the study of magic, and resembling in religion, customs, and language the Burmese. They are skillful workers in metal, and make mats, paper (from bark), leather, pottery, silk and woollen fabrics, sugar, and gunpowder. They have a trade with the British settlements in Indo-China, and with Tonquin. Most of the tribes are dependent upon Siam. The first Christian mission among the Laos was commenced in 1867 at Chieng May, about 500 m. N. of Bangkok, by the Presbyterian church in the United States.

**LAO-TSE.** See CHINA, vol. iv., p. 454.

**LA PAZ.** I. A W. department of Bolivia, bordering on Peru; area, 43,051 sq. m.; pop. in 1865, 519,465, about nine tenths of whom were Aymaras. The face of the country is extremely diversified, comprising some of the loftiest mountains (Illimani, Sorata, &c.) and deepest valleys on the American continent; while from the first descend most of the streams which unite to form the Rio Beni, one of the principal affluents of the Amazon. The soil is extremely fertile, and the vegetation varied and luxuriant. Fine timber and cabinet woods abound. Maize, wheat, and the other cereals are plentifully produced in almost all parts. Cotton, indigo, the sugar cane, tobacco, cacao, coffee, ginger, and pimento, with the several tropical fruits, are the chief productions of the valleys; while in the more elevated regions potatoes, *chuño* (a species of potato brought to market frozen and dried), *quinœa* (often used as a substitute for the two last), and the various fruits and many of the vegetables of the temperate zone are very plentiful. The coca plant is everywhere cultivated, and is the object of an extensive commerce. Cattle, horses, mules, sheep, and hogs are raised in prodigious numbers; vicuñas, alpacas, llamas, and guanacos are extremely

abundant, as are also jaguars, pumas, foxes, vizcachas, and monkeys. The vampire is common and destructive of cattle. Gold and silver are found in several places; but the chief mineral wealth of La Paz is derived from the copper mines of Corocoro. The celebrated Lake Titicaca is partly situated on the W. border of the department, a large portion of which is watered by the Rio Desaguadero, carrying the waters of this lake to that of Aullagas in Oruro. The department is also remarkable for the ancient ruins of Tiaguanaco, near the village of that name on the borders of Titicaca, and attesting the high civilization of a people anterior to the incas (probably the Aymaras). **II. La Paz de Ayacucho**, a city, capital of the department, in lat.  $16^{\circ} 30' S.$ , lon.  $68^{\circ} 30' W.$ , about 300 m. N. N. W. of Sucre; pop. in 1865, 83,092, nine tenths Aymaras. It is about 13,000 ft. above the sea level, built in amphitheatre in a deep valley formed by the Chuquiapo, a torrent which descends from the neighboring peak of Illimani, rising 8,000 ft. higher, and is here crossed by nine handsome bridges. The streets are not very regular, but the houses are substantially constructed, the lower part frequently of stone, and have a neat and agreeable appearance. The cathedral, fronting the principal square, is a beautiful edifice, tastefully decorated outside with bassi rilievi, and possessing a magnificent image of the Virgin of the Pilar of Saragossa, the gift of Charles V. Of the 14 other churches, some have much architectural beauty. There is a monastery, the university of San Andrés, a school of medicine, and a number of other schools public and private, besides the college of law, sciences, and arts, and a seminary. The *alameda* is a delightful resort for promenading; and the cemetery or *panteon* is surpassed in beauty by very few in South America. La Paz is the chief commercial emporium of the republic, owing to its situation almost due E. of the Peruvian port of Arica, which is in reality the most convenient for Bolivia. There is no industry of importance, and the principal trade consists in the traffic in coca leaves, and the export of copper extracted from the extensive mines of Corocoro in the vicinity. A curious commodity daily received in the markets is *taquia*, the dried excrements of the llama and its congeners, constituting the chief fuel used in the country.—The city was founded in 1543 by Alonzo de Mendoza, who named it Nuestra Señora de la Paz. In 1605 it was raised to a bishopric; and in 1825 it received its present appellation of La Paz de Ayacucho, in memory of the battle fought in the plain of the last name, decisive of Bolivian independence.

**LA PAZ**, a seaport of Mexico, capital of the territory of Lower California, on a bay of the same name, on the W. shore of the gulf of California, 240 m. N. W. of Mazatlan; lat.  $24^{\circ} 15' N.$ , lon.  $110^{\circ} 12' W.$ ; pop. about 500. Many of the houses show in their tasteful construction

that the town was once the abode of luxury. The port is well sheltered, and easily defensible against attack from the sea. But the shipping is now almost insignificant; and the pearl fisheries, once very extensive and productive, have lost much of their importance. The climate is hot and insalubrious, and the surrounding country is for the most part barren; yet there are numerous ranchos at some distance in the interior, exporting fruits and animal products.

**LAPEER**, a S. E. county of Michigan, drained by the sources of Flint and Belle rivers; area, 828 sq. m.; pop. in 1870, 21,345. It has a rolling surface and a rich soil, and is well wooded. The Port Huron and Lake Michigan, and the Detroit and Bay City railroads pass through it. The chief productions in 1870 were 357,521 bushels of wheat, 241,266 of Indian corn, 300,735 of oats, 37,585 of barley, 152,984 of potatoes, 33,650 lbs. of hops, 241,179 of wool, 646,757 of butter, 29,365 of cheese, and 29,835 tons of hay. There were 4,973 horses, 5,301 milch cows, 1,011 working oxen, 6,346 other cattle, 52,191 sheep, and 6,793 swine; 4 manufactories of carriages, 2 of iron castings, 1 of engines and boilers, 7 of saddlery and harness, 3 of sash, doors, and blinds, 1 of woollen goods, 11 flour mills, and 30 saw mills. Capital, Lapeer.

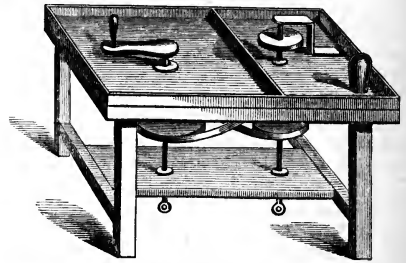
**LA PÉROUSE**, Jean François de Galaup, count de, a French navigator, born at Guo, near Albi, Languedoc, Aug. 22, 1741, perished probably by shipwreck at Vanikoro, an island in the South Pacific, in 1788 or 1789. He entered the navy at the age of 15, and in 1759 was wounded and taken prisoner in the engagement with Sir Edward Hawke off Belle Isle. Subsequently he served in the American war of independence, and in 1782 entered Hudson bay with a small fleet and destroyed the British trading establishments there. Upon the conclusion of the war Louis XVI., with a view of securing for the French people a share in the glory which the English were reaping from the discoveries of navigators like Cook, caused the frigates *Astrolabe* and *Boussole* to be fitted out under the command of La Pérouse for maritime explorations in the Pacific, and along the coasts of America, China, Japan, and Tartary. La Pérouse, sailing from Brest, Aug. 1, 1785, doubled Cape Horn and proceeded to the N. W. coast of America. From Mount St. Elias he explored the coast as far as Monterey, California, whence he crossed over to Asia. During the summer of 1787 he followed the coast from Manila to Petropavlovsk, at which place he arrived in September, having examined the waters which separate the coast of Tartary from the Japanese group of islands, and discovered the straits between the islands of Saghalien and Yezo which bear his name. From Petropavlovsk he sent to France copies of his journals and charts and other data, from which an account of his voyage was subsequently prepared. Sailing south in the latter part of September, he touched at Manua, one

of the Navigator's islands, where De Langle, the commander of the *Astrolabe*, and a number of men were killed by the natives, and thence proceeded to Botany Bay. A letter from La Pérouse to the French minister of marine, dated Botany Bay, Feb. 7, 1788, announcing his intention of proceeding to the isle of France by the way of Van Diemen's Land, the Friendly isles, and New Guinea, was the last intelligence ever received from the expedition. In 1791 a squadron was despatched under Admiral D'Entrecasteaux in search of La Pérouse, but failed of finding any trace of him. Dumont d'Urville while at Hobart Town in 1828 learned that fragments of a shipwrecked vessel and her equipments had been discovered in Vanikoro in the New Hebrides group, and sailing thither with his vessel the *Astrolabe*, ascertained that many years previous two ships had foundered on a reef off the W. coast of the island, and that such of the crews as had not been drowned or murdered by the savages had sailed from the island in a small vessel built by themselves, and never afterward been heard of. Believing that these were the ships of La Pérouse, he caused a cenotaph to be erected near the locality of the shipwreck.

**LAPHAM**, Increase Allen, an American physicist, born at Palmyra, N. Y., March 7, 1811. He was engaged as a civil engineer on the Welland canal, in Canada, and afterward on the canal around the falls of the Ohio at Louisville, Ky., where he began the collection of his herbarium, which now contains about 8,000 specimens. From 1833 to 1835 he was secretary of the Ohio board of canal commissioners. In 1836 he removed to Milwaukee, Wis., where he now resides, and where he has held several municipal and other offices. In 1862 he was elected president of the Wisconsin historical society. In 1873 he was appointed state geologist, and in 1874 was engaged in making a thorough geological and topographical survey of Wisconsin. He has been a frequent contributor to scientific periodicals, and was the first to demonstrate from minute personal observations that there is a slight lunar tide in Lake Huron. Among his productions are: "Notice of the Louisville Canal, and of the Geology of the Vicinity" (in Silliman's "Journal," 1827); "Wisconsin: its Geography, Topography, History, Geology, and Mineralogy" (1844; 2d ed., 1855); a "Geological Map of Wisconsin" (1855); and "Antiquities of Wisconsin" (in the "Smithsonian Contributions," vol. vii., 1855). In 1867 he made a valuable report to the legislature of Wisconsin upon the disastrous effects of the destruction of forest trees; and in 1869 he presented a memorial to congress suggesting that system of weather reports which has since been adopted.

**LAPIDARY** (Lat. *lapidarius*, a stone cutter, from *lapis*, a stone), a workman whose trade is the cutting and polishing of small ornamental stones. His apparatus consists almost exclusively of wheels or disks for grinding down,

slitting, and polishing the faces of minerals. These are of a few inches diameter, made of lead, pewter, brass, or iron, and of various soft alloys, and some used for smoothing the softest minerals are of willow or mahogany. The metal wheels are called laps. The term mill is applied to them all, and some are distinguished as slitting mills, others as roughing, smoothing, or polishing mills, of all which there are varieties adapted to the different degrees of hardness of the minerals. The polishing mill for the softest stones is formed of a coil of list, wound with the edges outward; it is also sometimes made of bristles like a brush, or of wood covered with buff leather. For slitting purposes an iron disk is employed of 8 or 9 in. diameter and  $\frac{2}{3}$  of an inch in thickness. The various disks used by the lapidary are adjusted to a vertical spindle, and one of them is set in the table or lapidary's bench, so as to revolve horizontally just above the surface. Its axis extends beneath the table, and is there connected by a belt with a driving wheel attached to another vertical axis, which also passes through the table and terminates above in a winch



Lapidary's Table.

or crank. This is turned with the left hand while the stone is guided upon the mill with the right. The mills are fed with moistened diamond powder or emery and water; and as the hard powder imbeds itself in the soft metal, this becomes merely the medium for holding the abrading material, and the softer substance apparently grinds and cuts the harder objects that are applied to it. A raised edge around the table prevents the dispersion of the diamond powder or emery. Close to the mill is a round iron rest set in the table, which can be turned nearer to or further from the disk. This is for supporting the arm of the workman in holding the stone to the wheel; or, when its upright extremity is capped with a wooden socket, which is perforated with a number of holes, it serves to retain at any desired angle a stick upon the end of which is cemented the stone to be ground in facets. By this contrivance the exact inclination required is given to the faces of ornamental stones. Diamond powder for the mills is prepared by grinding the waste particles in steel mortars till they lose their sparkling appearance. It is applied mixed with olive or sperm oil. The slitting mill is



charged with it around the extreme edge, and it is carefully renewed as required. It is more economical for this use, and applied to the surfaces of other mills for grinding the facets of hard stones, than emery; but the latter powder with water is employed for the more common class of stones. It is used of various degrees of fineness, and in such quantity that there shall always be a loose portion of it between the stone and the metallic surface of the lap. Polishing is effected by successively using finer and finer powders. The hardest small stones are finished on laps of copper or of pewter, and others on lead, and the powder used is rotten stone, which is plentifully applied with water. To make it adhere, the face of the metal is hacked in lines with the edge of a knife. For very soft stones, as alabaster, after these are smoothed upon a lead or wood mill with flour emery, the list mill is employed with pumice stone and water, and after this the buff leather disk with fine putty powder and water. The last polish is sometimes given with the hand and putty powder.—In the East Indies, wheels and rubbers are made of corundum or emery imbedded in lac resin. For the former about one third of the bulk is lac resin and two thirds is the powder. This is carefully stirred, a little at a time, into the melted resin; the mass is then kneaded and rolled upon a stone slab upon which fine corundum powder is sprinkled, and finally it is flattened into a disk with an iron rolling pin. The wheels are made of different degrees of fineness, and when used are set upon a horizontal axis, which the workman, sitting on the ground, causes to revolve with a spring bow, holding the stone in his left hand against the wheel, which is occasionally moistened and sprinkled with corundum powder. The rubbers contain a much smaller proportion of corundum; and the finest have intermixed the grindings of agates, carnelians, &c. Grindstones are used for giving shape to gems only in the works at Oberstein on the Nahe in Germany, where agates are fashioned into the form of various articles, as buttons, clasps, stamps, paper weights, mortars for chemical purposes, &c. Stones of large size are run by water power, and the workmen lie down in front of them when at work, the body being supported by a sort of stool. They acquire wonderful dexterity in giving the shape they desire to the hard stones, and produce with extraordinary rapidity playing marbles of perfectly globular form.—For full details of the processes of the lapidary, vol. iii. of Holtzapffel's "Mechanical Manipulations" may be consulted; also "A Popular Treatise on Gems" (New York, 1859-'67), by Dr. L. Feuchtwanger, and "Diamonds and Precious Stones" (New York, 1874), translated from the French of Louis Dieulaufait by F. Sanford. (See also DIAMOND, and GEM.)

**LAPIS LAZULI**, Lazulite, Ultramarine, or Blue Spar, a mineral distinguished for its beautiful azure-blue color, highly esteemed as an orna-

mental stone. It is commonly obtained of massive form, and of compact or granular structure. Crystals, which are rare, are 12-sided; a fine specimen of the regular dodecahedron with mirror-like faces is contained in the collection of the French school of mines. The mineral is a silicate of soda, lime, and alumina, with a sulphide, probably of iron and sodium. The analyses give variable results. That by Clément and Desormes, the first of those below, is regarded as giving the true composition; by following it, artificial ultramarine, a pigment formerly prepared directly from the mineral, has been successfully manufactured. The fourth, by Varrentrapp, is of an artificial ultramarine. The second analysis is by Klaproth, and the third by Varrentrapp, as given by Dufrénoy (*Minéralogie*):

CONSTITUENTS.	1.	2.	3.	4.
Silica .....	35·8	46·0	46·50	45·604
Alumina .....	34·8	14·5	31·76	23·304
Soda .....	23·2	...	9·09	21·476
Carb. lime.....	3·1	25·0	8·52	1·752
Sulphate lime. ...	6·5	...	5·89	Potash, } Sulph. acid, } 3·580
Sulphur .....	3·1	...	0·95	1·655
Oxide of iron. ...	...	3·0	0·18	Iron, } trace
Chlorine .....	...	...	0·42	trace
Loss .....	...	2·0	1·09	Lime, } 0·021
Total.....	100·0	100·0	100·00	98·735

The hardness of the mineral is 5·5; specific gravity 2·38, crystals 2·959. When melted by the blowpipe it loses its blue color; but a variety from Chili recovers it on cooling after calcination. Lapis lazuli occurs in calcareous rocks, associated and sometimes mixed with mica and iron pyrites. It is brought from Persia, China, Lake Baikal in Siberia, Bokhara, and recently from Chili and California. In trade it is known as the Armenian stone. The principal use of the stone has been for making the blue ultramarine pigment; and as from the best stone only 2 to 3 per cent. can be obtained, the cost of the purest article is sometimes over \$100 an ounce. The artificial preparations, however, are now very generally substituted. (See ULTRAMARINE.) Lapis lazuli was employed by the ancient gem engravers, and the fine specimens have ranked among choice jewels. The stones through which the mineral is disseminated are carved into many ornamental objects, as vases, snuff boxes, cups, and even architectural ornaments. In the Orloff palace at St. Petersburg are apartments lined with lapis lazuli. Imitations of it are made of bone ashes colored with oxide of cobalt.

**LAPITHÆ**, in Grecian legends, a people of the mountains of Thessaly, descended from Lapithes, the son of Apollo and Stilbe. They were governed by Pirithous, the son of Ixion, and are famous for their battles with the centaurs, who, being likewise sons of Ixion, claimed a share in their father's kingdom. The wars having been closed by a peace, Pirithous

invited the centaurs to a feast on occasion of his marriage with Hippodamia; but, heated with wine and urged on by Mars, they attempted to carry off the bride and other women, whereupon a conflict ensued, in which the Lapithæ were victorious. The story is related by Hesiod and Ovid. The Lapithæ were probably a Pelasgian people, whose conquest of some less civilized tribe originated the classic fable. To them is ascribed the invention of bits and bridles.

**LAPITO, Louis Auguste**, a French painter, born at St. Maur, near Paris, in 1805, died in Boulogne, April 7, 1874. He studied in Paris under Watelet and Heim, and in foreign countries, and became a distinguished landscape painter. Many of his works are in French, Belgian, and Dutch collections. One of the finest of them, in the Palais d'Orsay, was destroyed in the burning of that building during the commune (1871).

**LAPLACE, Cyrille Pierre Théodore**, a French navigator, born at sea, Nov. 7, 1793. He early entered the navy, became captain in 1828, and commanded in two expeditions of circumnavigation, which he described in his *Voyage autour du monde par les mers de l'Inde et de la Chine, exécuté sur la corvette de l'État la Favorite pendant les années 1830, 1831 et 1832* (5 vols., Paris, 1833-'9), and in his *Campagne de circumnavigation de la frégate l'Artemise pendant les années 1837, 1838, 1839 et 1840* (4 vols., 1845-'8). He was made vice admiral in 1853, and retired in 1858.

**LAPLACE, Pierre Simon**, marquis de, a French astronomer and mathematician, born at Beaumont-en-Auge, Lower Normandy, March 23, 1749, died in Paris, March 5, 1827. Of the events of his early life he seldom spoke after he had attained rank and distinctions, but he is known to have been of humble origin, and to have been enabled by the assistance of rich friends to study at the college of Caen and at the military school of Beaumont, whence at the age of 18 he went to Paris with letters of introduction to D'Alembert and others. D'Alembert at first took no notice of him; but receiving from him a remarkable paper on the general principles of mechanics, he at once interested himself in behalf of the young stranger, and by his influence procured him in 1768 or 1769 a professorship of mathematics in the military school of Paris. Thenceforth for more than half a century Laplace devoted himself to the pursuit of science with an ardor and industry productive of the most beneficial results, and which his participation in public business and politics never seriously interrupted. In 1773, when he was barely 24 years of age, his papers on the calculus and various astronomical questions, read before the academy of sciences, procured his admission into that body as an associate. A few years later he became examiner of the pupils of the royal artillery corps, and in 1785 he was elected a member of the academy of sciences. He subsequently lec-

tured on analysis at the normal school, served in the board of longitude, and presented to the council of 500 a report of the proceedings of the institute from its establishment. The revolution drew him into the sphere of politics, in which he accomplished nothing worthy of his fame, and in which the ignoble traits of his character were prominently displayed. At first he appears to have been a radical republican, and it is said that in 1796 he was one of a deputation who were presented at the bar of the council of 500 to swear eternal hatred to royalty. Two years later he paid his court to Gen. Bonaparte, fresh from his Italian campaigns, thus securing his election to the institute; and after the overthrow of the directory he was intrusted by the first consul with the department of the interior. So little capacity did he display in this office, however, that within six weeks he was superseded by Lucien Bonaparte, being appointed to a seat in the senate. Napoleon in his exile at St. Helena, with more point than justice, complained that Laplace "carried the spirit of the infinitesimal calculus into the management of business." In fact, the department was then one of the most difficult in France to manage, and a more experienced statesman than Laplace might have failed to discharge its functions properly. Under Napoleon he was made vice president and chancellor of the senate, a count of the empire, an officer of the legion of honor, and was the recipient of many other distinctions. He nevertheless turned against his benefactor when misfortunes overtook him, voted for his deposition in 1814, and was rewarded by Louis XVIII. with the title of marquis. He also suppressed in the second edition of his *Théorie des probabilités* (Paris, 1814) the dedication to "Napoleon the Great," contained in the edition of 1812, in which, as in the dedication to vol. iii. of the *Mécanique céleste*, of which he did not live to publish a second edition, he had expressed himself under lasting obligations to Napoleon for numerous benefits. During the hundred days he refrained from presenting himself at the Tuileries, and after the second restoration of the Bourbons his employments were chiefly of a scientific character, the most important being the presidency of the commission for reorganizing the polytechnic school, and that of the academy of sciences.—As a physicist Laplace occupies a position second to that of no mathematical philosopher since Newton, and to his labors the science of astronomy owes the discovery of the invariability of the major axes of the planetary orbits, and of the great inequality of the motions of Jupiter and Saturn, the settlement of the problem of the acceleration of the mean motion of the moon, the theory of Jupiter's satellites, and other important laws. In his knowledge of physical principles he was probably superior to any contemporary analyst; and his invention, in conjunction with Lavoisier, of the calorimeter for measuring the capacities of bodies for

heat, his discovery of the cause of the discrepancy between the theoretical and observed velocity of sound, his rules for barometrical measurement, and his theories regarding capillary attraction, tides, and atmospheric refraction, show that in some of the most important branches of general physics his mind was not less actively and profitably employed than in mathematical analysis. The crowning glory of his scientific career was his *Mécanique céleste*, a book which has been truly said to have had no predecessor, and which must wait for a second Laplace to arise ere it finds a rival. In it he sought to digest on a uniform scientific basis the abundant materials relating to the application of analysis to physical astronomy, which had been accumulating during nearly a century, and which, written in various languages, with differing notations and in various stages of scientific progress, presented a mass of matter not only difficult of access, but almost incomprehensible to any but the most recondite student. The result of his labors appeared in 16 books, published in 5 vols. 4to, with four supplements, between 1799 and 1825, and arranged as follows:—vol. i.: book i., "On the General Laws of the Equilibrium of Motion;" book ii., "On the Law of Universal Gravitation and the Motion of the Centres of Gravity of the Heavenly Bodies;"—vol. ii.: book iii., "On the Figure of the Heavenly Bodies;" book iv., "On the Oscillations of the Sea and the Atmosphere;" book v., "On the Motions of the Heavenly Bodies around their Proper Centres of Gravity" (Paris, 1799; re-published in 1829-'30);—vol. iii.: book vi., "On the Theory of the Planetary Motions;" book vii., "On the Theory of the Moon," and supplement i., "On the two great Inequalities of Jupiter and Saturn" (Paris, 1804);—vol. iv.: book viii., "On the Theory of the Satellites of Jupiter, Saturn, and Uranus;" book ix., "On the Theory of Comets;" book x., "On different Points relative to the System of the World," and supplements ii. and iii., comprising the "Theory of Capillary Action" (Paris, 1805);—vol. v.: book xi., "On the Figure and Rotation of the Earth;" book xii., "On the Attraction and Repulsion of Spheres, and the Laws of the Equilibrium and Motion of Elastic Fluids;" book xiii., "On the Oscillation of the Fluids which cover the Planets;" book xiv., "On the Motions of the Heavenly Bodies around their Centres of Gravity;" book xv., "On the Motions of the Planets and Comets;" book xvi., "On the Motions of the Satellites," and supplement iv., "On the Development in Series of the Radical which expresses the Mutual Distance of two Planets" (Paris, 1823-'5). "Within this immense programme," says Professor Nicol, "placed as if parenthetically, one finds the most striking notices on almost every important problem of mechanical physics, any one of which would have made the fortune of an ordinary mathematician." In consequence, however, of his almost total neglect to refer to

the labors of his predecessors or contemporaries in this, and indeed in all his works, it is difficult for the student to know how much of it belongs to Laplace and how much to others; and he has therefore, not without apparent reason, been sometimes considered more of a compiler than a discoverer. The name of Lagrange, his great contemporary and friend, is rarely mentioned, and one of the latter's finest analytic discoveries is on one occasion cursorily referred to as "the formula No. 21 of the second book of the *Mécanique céleste*." In like manner the claims of Taylor and Maclaurin to the theorems passing under their names are ignored, while his references to himself are innumerable. With all needful restorations and acknowledgments, however, almost any one of the original researches of Laplace contained in the *Mécanique céleste* is sufficient to stamp him as one of the greatest of mathematicians. The only translation of this work is that by Dr. Bowditch of Salem, Mass., with full commentaries, published at Boston. (See BOWDITCH, NATHANIEL.) Mrs. Somerville's "Mechanism of the Heavens" is a summary of a portion of the work. Laplace's remaining works consist of his *Théorie analytique des probabilités*, the most mathematically profound treatise on the subject which has yet appeared, and containing his celebrated method for the approximation to the values of definite integrals (Paris, 1812; 3d ed., 1820, with four supplements); his *Exposition du système du monde* (2 vols. 8vo, 1796; 6th ed., containing a eulogium on the author by Baron Fourier, 4to, 1835), "a *résumé* of all modern astronomy, unsurpassed for perspicuity and elegance in any scientific literature," translated by Prof. Pond; and over 40 important memoirs, principally on astronomical subjects, published between 1772 and 1823. Of the three works above named, an edition in 7 vols. 4to (Paris, 1843-'7) was published under government auspices. He died after a short illness. It is commonly related that his last words were: "What we know is of small amount; what we do not know is enormous." But De Morgan states, apparently with authority, that the last words of the great astronomer were different. During his illness, says De Morgan, "he thought much on the great problems of existence, and often muttered to himself, *Qu'est ce que c'est que tout cela!* After many alternations, he appeared at last so permanently prostrated that his family applied to his favorite pupil, Poisson, to try to get a word from him. Poisson paid a visit, and after a few words of salutation said: 'I have good news for you. A letter has been received at the bureau of longitudes from Germany, announcing that M. Bessel has verified by observation your theoretical discoveries upon the satellites of Jupiter.' Laplace opened his eyes and answered with deep gravity: 'Man pursues nothing but chimeras.' He never spoke again." He has been accused of holding materialistic views; but his writings give no evidence of a

tendency in that direction, and the subject is one which he is known to have avoided. As a scientific writer he was perspicuous and elegant, and his *Système du monde*, as a specimen of style, is called by Arago "one of the most perfect monuments of the French language."

**LAPLAND** (Lappish, *Sameanda* and *Somellada*), the land inhabited by the Lapps, the northernmost portion of the Scandinavian peninsula and the European continent, comprised in Norway, Sweden, and Russia. It constitutes portions of the Norwegian provinces of Tromsø and Drontheim, of the Swedish läns of Norrbotten and Westerbotten, and of the Russian governments of Uleaborg in Finland and Archangel. On the north is the Arctic ocean, east the White sea, and south the gulf of Bothnia. The coasts are indented with numerous bays, and faced with small islands. Near the gulf of Bothnia the surface of the country is a plain covered chiefly with forests of spruce and fir. The ground then rises gradually, terminating in lofty peaks of rock, exceeding in certain places 6,000 ft. in height. The descent from these ridges to the Arctic ocean is more abrupt than that toward the south. The limit of perpetual frost is 3,500 ft., so that there are many summits half a mile above the snow line. The rest of the surface is generally rocky, and, except in a few favored spots like the valley of the Alten, displays little vegetation besides sturdy forests and a few stunted bushes and perennial moss. There are many lakes, among them the Enare and Imandra, connected with the sea by streams, which are inconsiderable in autumn and winter, but become large rivers in the spring. The most important watercourses are the Tornea, Kemi, Kalix, Lulea, Pitea, Umea, Tana, and Alten. The climate is much milder on the seacoast than in the interior, and owing to the Gulf stream many of the northern fiords never freeze. The mean annual temperature at Cape North is about 30° F. In winter the sun is for many weeks below the horizon, and in midsummer there are weeks of continuous day.—Of the 160,000 inhabitants of Lapland, only about 15,000 or 20,000 are Lapps (in their own language, *Sabme* or *Sam*), who form a subdivision of the Finnic race. (See FINNS.) They were originally inhabitants of Finland, but were gradually pushed by the Finns further north and west to their present territory. According as they are fishermen or reindeer herdsman, they are distinguished as "sea Lapps" and "mountain Lapps," and either occupy settled habitations or lead a nomadic life. They are extremely small in stature, and their hair is black and straight, presenting a great contrast to the tall and blond Norwegians and Swedes. Their skin is yellow, the forehead broad, the head poised on a short and round neck, the nose well formed, the cheek bones protruding, the chin pointed, the cheeks hollow, and the lips straight and thin. They are agile, but quickly exhausted by labor, rather from bodily weakness than

laziness. They dress in furs, with trousers and shoes of reindeer skin. They protect the head by means of a sort of cowl, but the Russian Lapps generally wear fur caps with ear covers. The dwellings of the mountain Lapps are small tents, consisting of a skeleton of bent sticks, covered with a coarse cloth. In the middle is a hole which serves as a flue for the fireplace underneath. The sea Lapps have better habitations, generally consisting of wooden huts with several apartments. They live exclusively on animal food; bread, which they obtain of Russian tradesmen, is considered a delicacy. The women are very skilful in making garments, and the men cut out of wood with astonishing ingenuity, considering the imperfect tools they employ, all the utensils they need. Many still hunt with bow and arrow, but some of them have gained possession of guns. Polygamy, though not prohibited by custom, is very rare on account of the high price which has to be paid for women. The daughter of a rich man costs sometimes as much as 100 reindeer, while a poor girl is seldom sold for less than 20. The price is considered as a repayment of the expenses incurred in bringing up a daughter, and also as a remuneration to the father for losing her services. The Lapps have been converted to Christianity, and belong to the Lutheran church in Norway and Sweden, and to the Greek church in Russia. When heathens, they worshipped five orders of divinities: supercelestial, celestial, atmospheric, manes, and demons. Radien Athzie, the highest god, created everything; he was assisted by Ruona Neid, the fruitful virgin; and his son Radien Kiedde kept the world in order. A great god was Storyunkare, the lord of beasts, of the chase, and of fishing. Tiermes brought sometimes weal, and sometimes woe; he carried the hammer; his bow was the rainbow, and in his wrath he slew men and beasts with lightning. His symbol was a rude block of wood, which no female durst approach. The magicians of the Lapps prophesied by means of a drum, on which they painted the images of the gods and of things about which inquiry was made; having slept with this under his head, the magician on awaking told what he had seen in his dreams.—The Lappish language is related to Finnish, but has of late incorporated many Swedish words. There are several dialects of it. Nouns possess no grammatical gender, but the singular and plural are distinguished, and in several cases also the dual number. There are 11 cases, and the degrees of comparison for adjectives. The first ten numerals are *akta*, *kvekte*, *kalm*, *nelye*, *vita*, *kota*, *kyetya*, *kaktse*, *äktse*, and *lokke*. Ordinal numbers are formed by adding *at*. The verbs have causative, diminutive, intensive, inchoative, and several other forms, as well as special forms for negation. Postpositions take the place of prepositions.—See Henrik Helms, *Lapland und die Lappländer* (Leipsic, 1868); Pettersen,

*Lapland* (Stockholm, 1871); and Hermann and Karl Auel, *Ein Polar Sommer: Reise nach Lapland* (Leipsic, 1874).

**LA PLATA**, a S. W. county of Colorado, formed in 1874 from portions of Conejos, Lake, and Saguache counties; area, about 7,000 sq. m. It borders on Utah and New Mexico, and is watered in the north by the Rio Dolores and the Rio San Miguel, and by the Uncompahgre river, a tributary of the Gunnison. In the south it is drained by the Mancos, La Plata, Las Animas, and Los Pinos, tributaries of the San Juan. The Rio Grande rises in the E. part. The county contains the Sierra San Miguel mountains, and is traversed from S. W. to N. E. by the Sierra La Plata range. A strip 20 m. wide along the Utah border, and 15 m. wide along the New Mexico border, is occupied by the Ute Indian reservation. Valuable gold mines have recently been discovered in this county, and large numbers of miners are resorting thither. Capital, Howardsville.

**LA PLATA.** See ARGENTINE REPUBLIC.

**LA PLATA, Rio de.** See PLATA, RIO DE LA.

**LAPONNERAYE, Albert**, a French historian, born in Tours, May 8, 1808, died in Marseilles in September, 1849. He established a school and a journal at Marseilles. The government became so alarmed at the popular effect of his lectures in 1831 on the history of the French revolution, that he was not permitted to continue them, and he was several times arrested on account of his liberal writings. His works include *Cours public d'histoire de France depuis 1789 jusqu'en 1830* (1831-'4); *Histoire de la révolution française depuis 1789 jusqu'en 1840* (3 vols., 1840); an edition of Robespierre's writings (3 vols., 1842); and *Histoire universelle depuis les premiers âges du monde* (8 vols., 1845-'6), left unfinished.

**LA PORTE**, a N. W. county of Indiana, bordering on Michigan and Lake Michigan, and drained by Kankakee, Little Kankakee, and Gallien rivers; area, 450 sq. m.; pop. in 1870, 27,062. The surface consists partly of rolling prairies, interspersed with groves of timber; the soil is generally fertile. It is traversed by five important railroads. The chief productions in 1870 were 519,018 bushels of wheat, 394,294 of Indian corn, 148,311 of oats, 151,812 of potatoes, 47,277 lbs. of wool, 320,766 of butter, and 22,333 tons of hay. There were 7,297 horses, 6,135 milch cows, 9,435 other cattle, 15,031 sheep, and 15,386 swine; 3 manufactories of agricultural implements, 2 of brick, 8 of carriages, 2 of iron castings, 6 of saddlery and harness, 6 of tin, copper, and sheet-iron ware, 2 of woollen goods, 2 breweries, 8 flour mills, and 12 saw mills. Capital, La Porte.

**LA PORTE**, a city and the county seat of La Porte co., Indiana, situated on the border of a beautiful and fertile prairie, 12 m. from Lake Michigan and 135 m. N. by W. of Indianapolis; pop. in 1850, 1,824; in 1860, 5,028; in 1870, 6,581. It is at the junction of the Lake Shore and Michigan Southern railroad with the In-

dianapolis, Peru, and Chicago line, and is a place of considerable trade. It contains founderies and machine shops, manufactories of agricultural implements, flouring, saw, and planing mills, &c., five banks, good public schools, a public library, a semi-weekly and two weekly newspapers, and 17 churches. A chain of seven beautiful lakes runs N. of the city, which from their facilities for boating and bathing are a favorite summer resort.

**LAPPENBERG, Johann Martin**, a German historian, born in Hamburg, July 30, 1794, died Nov. 28, 1865. The son of a physician, he was sent to study medicine at Edinburgh, but applied himself to historical and political researches. After visiting the highlands and the Hebrides, he went to London, where he studied the English government and constitution. He continued his legal studies at Berlin and Göttingen, and received the degree of doctor in 1816. He was sent by the senate of Hamburg during the congress of Troppau as minister resident to the Prussian court, and resided in Berlin till in 1823 he was appointed to the charge of the archives of Hamburg. In this office he discovered many valuable historical memoirs that were supposed to be lost, among which were the records of the old cathedral of Hamburg. He also made an important collection of diplomatic notes in a journey through the north of Europe. In 1848 he became a member of the senate. In 1850 he took part as plenipotentiary in the negotiations at Frankfurt, which ended with the pacification of Germany by the convention of Olmütz. Many of his historical works relate to the antiquities of the Hanse towns, especially Hamburg, and of northern Germany. Among them are: *Urkundliche Geschichte des Ursprungs der Deutschen Hansa* (2 vols., Hamburg, 1830), a continuation of the work of Sartorius; *Die Geschichte Helgolands* (1831); *Hamburgisches Urkundenbuch* (1842); *Die Elbkarte des Melchior Lorchs* (1847); and *Hamburger Chroniken* (1852-'61). His most remarkable work is the *Geschichte von England* (2 vols., Hamburg, 1834-'7), continued by Pauli (2 vols., 1853-'5), and translated into English by Benjamin Thorpe, under the title of "History of England under the Normans," with additions and comments by the translator (London, 1845-'57). He made valuable contributions to the *Monumenta* of Pertz, and to the *Encyclopädie* of Ersch and Gruber, and published editions of several old authors.

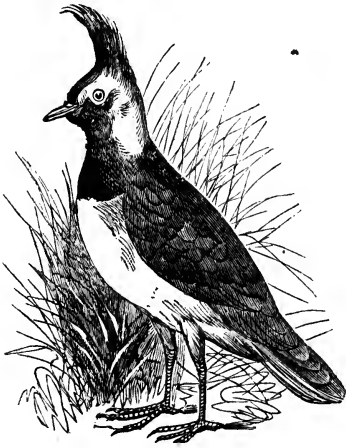
**LAPPS.** See LAPLAND.

**LAPRAIRIE**, a S. W. county of Quebec, Canada, bounded N. by the St. Lawrence river, opposite the island of Montreal; area, 173 sq. m.; pop. in 1871, 11,861, of whom 10,154 were of French origin or descent, and 1,351 Indians. It is traversed by the Champlain and Province Line divisions of the Grand Trunk railway. Capital, Laprairie.

**LAPWING**, a plover of the genus *vanellus* (Linn.). The bill is shorter than the head,



slender, and straight, vaulted and curved at the end of both mandibles; wings very long and pointed, with the second and third quills equal and longest; tail moderate, broad, and even; tarsi longer than the middle toe, rather slender; anterior toes united at the base, hind toe not reaching the ground; claws short and slightly curved. About half a dozen species are described in Europe, South America, and northern Africa. They live in pairs in marshy moors and in dry or open districts, collecting in winter into flocks on the downs and seashore; their flight is rapid, and accompanied by a fanning noise, which has given them their name, and is performed with numerous singular evolutions and often repeated notes; they run with great speed on the ground. The food consists of worms, slugs, and insects; the nest is made of dried grass, and is placed in a slight hollow in the ground, generally containing four eggs; they adopt various stratagems to divert



Lapwing (*Vanellus cristatus*).

attention from the nest and young. The European lapwing (*V. cristatus*, Meyer) is a very handsome bird, of about the size of a pigeon; the upper parts are deep glossy green; the top of the head, crest, fore part of the neck, and breast black; sides of the neck, abdomen, and base of the tail white; a long delicate crest falls gracefully over the back; the tail feathers, except the outer, terminate in a large black space. The females and young have less metallic lustre, and their tints are less black. It is rather shy, but the males are very pugnacious in the love season; the eggs are greenish, spotted with black; incubation lasts 24 days. The flesh, though generally lean and dry, is esteemed as food, and the eggs are said to be delicious. It is widely distributed throughout Europe, northern Asia, and northern Africa. Some of the foreign species, as the *V. Cayanaensis* (Gmel.), have a spur at the fold of the wing, but in other respects resemble the European lapwing; they are very noisy, like

most of the plovers. Other lapwings of allied genera have fleshy appendages and caruncles at the base of the bill, as well as spurs on the wings, and defend themselves bravely against birds of prey.—For characters of the family, see PLOVER.

**LAR**, a town of Persia, capital of the province of Laristan, 175 m. S. S. E. of Shiraz, on the road to Beloochistan; pop. about 12,000. It contains good houses and one of the finest bazaars in Persia. The palace of the governor has strong walls and towers, and on an adjoining hill are the ruins of a castle. Cotton goods, firearms, and powder are manufactured to a limited extent.

**LARAMIE**, an E. county of Wyoming territory, bounded N. by Montana, E. by Dakota and Nebraska, and S. by Colorado; area, about 14,000 sq. m.; pop. in 1870, 2,957. It is intersected by the North Platte, and watered in the south by the South Platte and in the north by the Big Cheyenne, a branch of the Missouri. The N. E. part is occupied by a portion of the Black Hills. The Union Pacific and Denver Pacific railroads traverse the S. part. In 1870 there were 2 manufactories of tin, copper, and sheet-iron ware, 1 of boots and shoes, 1 of jewelry, and 2 railroad repair shops. Capital, Cheyenne, which is also the capital of the territory.

**LARAMIE**, a city and the county seat of Albany co., Wyoming territory, on the Union Pacific railroad, 7,122 ft. above the level of the sea, 57 m. by rail and 40 m. in a direct line W. N. W. of Cheyenne; pop. in 1870, 828; in 1874, about 2,500. It is regularly laid out at right angles with the railroad. A stream of clear cold water, fed by a spring at the foot of the Black Hills a few miles E., runs through the principal streets. The railroad company has erected extensive machine shops, a depot, and a large hotel; and there are also a court house and jail, a national bank with a capital of \$50,000, two schools, five churches, and two daily newspapers. It was laid out in April, 1868, when the railroad reached this point.

**LARASHI**, or **Larache**. See EL-ARAISH.

**LARCENY** (Fr. *larcin*, Lat. *latrocinium*, theft), the taking and removing, by trespass, of personal property, which the trespasser knows to belong either generally or specially to another, with the intent of depriving him of his general or special ownership therein. To this definition some authorities, but not all, add the further element that the act must be done for the sake of some advantage to the wrong doer. It cannot indeed be doubted that the crime of theft may be fully committed although the act be done without any thought of one's own advantage, and exclusively for the benefit of another; as if he should steal bread or clothing for a hungry or a naked man. Circumstances like these might affect the moral character of the action, and might mitigate the punishment inflicted by the court; but they could not change the legal character of the

case. At common law personal property alone could be the subject of this offence; of lands there can plainly be no larceny; and as the law conceives that everything attached to the land or realty partakes of its character, it would not be larceny, independently of statutes, to sever and carry away with felonious intent standing grain, or growing grass, or fruits from trees; or lead or copper fixtures from a building. But if these things were severed at one time and carried away at another after an interval of time sufficient to render the two transactions distinctly separate, a larceny would be committed; for the property would become by the severance the personal property of the owner of the realty, and rest as such in his possession before the asportation. The too narrow and technical construction of the common law in this respect has been remedied by legislative enactments. It is also essential to the offence that the thing stolen be of some value, though the smallest value, less even than that of the smallest coin, is sufficient. The common law recognizes no value in choses in action, so called, that is, in notes and other personal securities. It esteems them mere evidences of valuable rights; and on the principle that their merely material worth is merged in their representative value, there can be no larceny of such instruments, nor could a suit be maintained even for the value of the paper upon which they were written, unless they had been, by payment or otherwise, rendered void. This defect of the common law has also been remedied, and, by statutes, bank notes, books of account, notes and other valuable securities, are rendered subjects of larceny. The principle of value is also applied in the case of animals known to the law as *feræ naturæ*. It is the rule of the law that animals wild by nature are not subjects of larceny until they are reclaimed, and then only when they are fit for food. By the common law therefore there can be no larceny of dogs and cats and many other animals, however the civil jurisprudence may recognize a right of property in them.—A taking and a carrying away are also essential to constitute larceny, and an indictment for this crime must charge both these acts. If the party accused have for only an instant of time perfect control over the property, any, even the slightest, removal of the whole of it is sufficient. Thus one was held guilty of larceny who had snatched a watch, the guard of which, though for an instant free from the person of the owner, was while being withdrawn by the thief caught and arrested by a button. But where a purse became entangled by its strings with keys in the owner's pocket, though it had been raised from its place and out of the pocket, yet there was not a perfect control of the purse, and consequently no such carrying away as is essential to complete the offence. The required ownership may be either general or special. Stolen goods restolen from a thief

may be alleged in an indictment to be either his property or that of the true owner. And it is said that one may commit larceny of his own property, if he take it from the possession of his bailee, with the intent to charge him for its loss.—It is further requisite to the constitution of the crime of larceny that there be a coincidence in point of time of two distinct intents, viz., an intent to trespass on another's personal property, and an intent to deprive him of his ownership therein. Therefore, if one too drunken to conceive an intent to steal take property, but surrender it before any such intent is entertained, there can be no conviction for larceny. Nor was this crime held to have been committed in a case where, though there was a trespass, the property was taken with the intention of converting only its use to the service of the trespasser. The rule is that the trespass must concur in time with the intent to steal. This rule may seem to be and perhaps is rather technical than reasonable; but it is firmly fixed in criminal jurisprudence, and a clear apprehension of it is necessary to the right conception of the crime of larceny.—Trespass is a wrongful act of force done to the possession of another. Therefore, in respect to larceny, there can be no trespass against an owner who has not the possession of the property taken. On this principle rests the familiar rule of law, that common carriers and other bailees cannot commit larceny of the goods intrusted to them, so long as this relation exists; for under their contract of bailment they, and not the owners, have the legal possession of the property, and the essential trespass is therefore impossible. For example, the master of a ship, who steals one of several packages delivered to him to carry, does not commit larceny; but if he first break the package and then steal part of its contents, the offence of larceny is complete. The distinction between the two cases is clear. It is evident that the bailee must be first divested of his legal possession before the trespass is possible. In the former of the cases proposed, although by stealing the package without breaking its bulk he destroys the privity of contract between himself and his bailor, still the act is committed in respect of goods which at the time are in his legal possession; the termination of the contract and the act of conversion are simultaneous. But where the package is first broken, the act of breaking determines the contract of bailment and the right of the bailee to hold the property, for that is on the instant revested in the owner. Any act of conversion of the goods to the bailee's own use, after a trespass upon the owner's legal right has destroyed the trespasser's right of possession, completes the offence of larceny. A distinction is to be observed between this legal possession and a mere custody. Thus servants who have a thing in their custody to keep, or clean, or carry, have no right of possession; their possession is their master's possession, and he may at his own

pleasure take the thing from their hands; therefore they may commit larceny of any goods in their custody which came to them by delivery from the master, or were otherwise in his legal possession.—In all cases in which the legal possession is rightfully acquired, it is plain that trespass and therefore larceny cannot be possible. This principle may be practically illustrated by the example of lost goods. The finder may lawfully take such goods into his possession. He acquires a special property in them, defeasible only by the owner, and in virtue of this has the legal possession, so that, though he afterward ascertain who the owner is, and with felonious intent convert the goods to his own use, he is not guilty of larceny. To constitute the crime in such cases, the finder must at the time of the finding either know the owner, or have means of knowing him, or have reason to believe that he may be found, and must at that time have the felonious intent of appropriating the goods to his own use. The essential element and criterion of a trespass is the wrongful force. This force need not be exerted physically. It may consist in the unjust use of legal process. So it is a sufficient trespass to entice away an animal by the voice, or by offering food. A thief commits a trespass when he has gotten the control of an article by inspiring fear in the owner. In these cases the law refers the surrender of the ownership to the thief's act of force. Not so, however, when one is induced by a fraud to part with his property. Whatever remedy the defrauded owner may have in such a case in civil jurisprudence, in the criminal law there is no larceny; and though the intent of the taker were ever so felonious, yet the owner's consent precludes the act of trespass without which, as we have seen, the offence is not complete. So, if one obtains goods by falsely personating the party who had ordered them, he is not guilty of larceny, whatever be his intent, for the owner means to pass the property in the goods by the delivery. But, on the other hand, if he gets the loan of an article, his concurrent intent being to steal it, the owner's consent avails him nothing, and he commits the crime. The same principle applies to those cases in which an owner delivers goods with the understanding that the property in them is to pass when the price is paid, but the taker's object is to get possession of them without any intention of performing this condition.—The second intent essential to constitute the crime is the intent to deprive the owner of his ownership, or of his whole right of property, in distinction from any mere particular interest in it. So that he is no thief who takes a horse, however wrongfully, with the intention of using and then returning him.—The common law distinction between grand and petit larceny, which was determined by the value of the thing stolen, is in the United States very generally abolished. Compound larceny is larceny aggravated by taking the thing stolen

from the house or person of the party against whom the theft is committed.

**LARCH** (*larix*, the ancient name), a genus of deciduous coniferous trees, of the pine subfamily. They have at times been classed with the pines and the firs, from both of which they differ, principally in their deciduous clustered leaves and simple pollen grains. There are but few species, natives of mountainous countries in the northern parts of both hemispheres. The American larch (*L. Americana*) extends from the mountains of Virginia northward to Hudson bay; in New England and Canada it is known as hackmatack, and in the southern and western states it is called tamarack. In the forests it reaches the height of 70 ft., but is usually much smaller; in its more northern localities it is found on uplands,



American Larch (*Larix Americana*).

but as it advances south it more frequently grows in moist soil; in cultivation it succeeds on almost any soil, but makes the most rapid growth in a deep and moist one. It is a slender, erect tree, with horizontal branches; the primary leaves are scattered; the secondary ones are many in a fascicle, developed early in the spring from lateral, scaly, and globular buds; they are linear, about an inch long, of a very soft texture, of a light bluish green, which becomes in autumn a soft yellow color. The sterile catkins are borne near the ends of the branches, erect, round, and about a quarter of an inch long; the fertile ones, placed near the middle of the branches, are erect, half an inch long, of few scales, which at flowering time are of a crimson color; the ripe cone is about three fourths of an inch long. Some make a distinction between the black and the red larch,

but the only differences are those which may be produced by locality. The wood is very close-grained, compact, and remarkable for strength and durability; it is very heavy, and almost incombustible except when splintered; on account of these qualities it is valued in ship building. As an ornamental tree it is inferior to the European larch (*L. Europæa*), which differs mainly in its more pendulous branches and the shape and color of its cones, which are about one half larger. This species is found throughout central Europe, especially in the Alps, and is largely cultivated both as an ornamental and a timber tree. It is of remarkably rapid growth, and large plantations of it soon yield profitable returns. The plantations of the dukes of Athol in Scotland have become historical as illustrations of extensive and



European Larch (*Larix Europæa*).

profitable arboriculture; previous to 1826 the duke and his predecessors had planted more than 14,000,000 larches, occupying over 10,000 acres. Some plantations of moderate size have been set in our western states with prospects of success. A number of named varieties, in which there is a departure from the typical form, are offered in European nurseries. A very full account of the species, and of its cultivation and uses, is given in Loudon's "Arboretum et Fruticetum," vol. iv. The western larch (*L. occidentalis*) was first discovered by Nuttall in the northwest; it is found along the Columbia and other rivers of these regions, where it grows to the height of 150 ft. A few other species are enumerated, but little is known of them.—The FALSE LARCH is *pseudolarix Kämpferi* from China, where it is a favorite tree. It has an aspect between that of a

cedar and a larch. Its much longer leaves and larger and differently shaped cones distinguish it from the larch. The few specimens that are in cultivation in this country give promise of its success. It is also called the golden pine, a translation of its Chinese name.

**LARCHER, Pierre Henri**, a French scholar and author, born in Dijon, Oct. 12, 1726, died in Paris, Dec. 22, 1812. He early distinguished himself by his proficiency in Greek and English literature. In 1767 he wrote an able reply to Voltaire's *Philosophie de l'histoire*. In 1778 he was admitted a member of the academy of belles-lettres, and on the establishment of the imperial university he was appointed professor of Greek in that institution; but he was then over 80 years old, and had to discharge his duties by deputy. He died from a fall. His reputation chiefly rests on the translation of Herodotus (Paris, 1786), which is valuable for its geographical and chronological notes.

**LARD**, the oily portion of hogs' fat, separated from the animal tissues by the process called rendering, which is melting it out at the temperature of boiling water, and commonly with the mixture of a small quantity of water. The best and firmest lard is obtained exclusively from the fat which surrounds the kidneys; but the common qualities of commerce are derived from the entire fat of the animal. To render this harder various adulterating substances are added, as mutton suet, starch, potato flour, and even caustic lime. Alum also is often added with the view of increasing its whiteness; and in England common salt and the carbonates of soda and potash have been detected in samples of it. The presence of water and its quantity may be determined by submitting a weighed portion to moderate heat; it escapes in bubbles, and when these cease to appear the loss of weight indicates the proportion. If starch is present, it will cause a solution of iodine with which a particle of the lard is mixed to turn blue or even black. The proportion of the adulterating ingredients sometimes amounts to more than 25 per cent., of which the chief article is some farinaceous substance. Water has been found to the extent of 12 per cent.; alum of 2 to 3 per cent.; and quicklime of 1 per cent. Lard as prepared is run into kegs, but the best qualities are collected in England in bladders, and are distinguished by the name of bladder lard. When pure, the article should be firm and white, and entirely free from taste or smell; it should melt at 212° F. without bubbling, and without depositing any sediment; the melted fluid should be nearly as clear and transparent as water. Its melting point varies from 78.5° to 87.5° F. Its composition in 100 parts, as given by Braconnet, is: stearine and margarine 38, oleine 62.—Lard is extensively used in culinary operations as an article of food; it enters into the composition of pastry, and is the material in which fish and other articles are commonly fried. In this operation the

presence of flour is sometimes indicated by the substances fried adhering to the pan. In pharmacy lard is the material which forms the bulk of most of the ointments and cerates, and may be used alone as an ointment. A good article for this use, that contains no noxious ingredients, and is not liable to melt in warm climates, is difficult to be procured. The tendency to rancidity may be partly counteracted by adding to the melted lard a tincture of benzoin, of guaiacum, or of poplar buds. The oil of pimento and balsam of Peru are said to have the same preservative influence. The substance is also employed for lubricating machinery, for which use it is particularly important that it should be free from glutinous adulterants.—By the separation of the stearine and margarine from lard the oily product called lard oil is obtained. The manufacture of this is carried on to an immense extent in Cincinnati and Chicago. Of the stearine are made candles, and other portions of lard enter into the production of soap. A large portion of this oil is sent to France, where by the skill of the chemist it is incorporated with olive oil to the amount of 60 or 70 per cent., the mixture then coming back to be sold as pure olive oil. Some interesting properties of lard when combined with rosin, in the proportion of 3 parts by weight of lard to 1 of rosin, were communicated by Prof. Olmsted to the American association at their meeting in New Haven in 1850. When melted together, the mixture is semi-fluid in cold weather. When applied to leather, it renders it very soft and impermeable to air and moisture, and it is particularly well adapted for lubricating the pistons of air pumps, as it is found to protect the brass from corrosion, which the ordinary lubricants induce. The rosin appears to prevent the formation of an acid in the lard, and thus the compound is well adapted to protect the surface of any metal from rust. When used for iron, a little powdered graphite may be added. When the mixture is used instead of other oily substances for making soap, the tendency of this to become rancid when wet and remaining damp is checked. Other uses readily suggest themselves. As an illuminating agent in solar lamps, Prof. Olmsted found lard oil combined with rosin superior for a time to lard oil alone, but the wick after a time became clogged, lessening the brilliancy of the light.—In the year 1873-4, 191,139,000 lbs. of lard were produced in the United States, chiefly in Illinois and Ohio; the product in the preceding year was 218,655,238 lbs. The chief centres of this industry are Chicago and Cincinnati. In 1873, 230,534,207 lbs. of lard, valued at \$21,245,815, were exported from the United States, chiefly to Germany, England, and Belgium. The amount of lard oil exported was 388,836 gallons, valued at \$298,731. According to the census of 1870, the total value of the lard oil produced in the United States in that year was \$2,552,510.

**LARDNER, Dionysius**, a British writer on physical science, born in Dublin, April 3, 1793, died in Paris, April 29, 1859. After four years' experience in the office of his father, a solicitor, he entered Trinity college, Dublin, in 1812, and graduated in 1817. He continued a resident member of the university till 1827. During his college career he evinced an extraordinary aptitude for mathematical studies, and gained between 15 and 20 prizes in metaphysics, pure mathematics, natural philosophy, astronomy, and moral philosophy. He took orders, and was for some time chaplain at his college; but he subsequently desisted from all clerical functions. During his residence at the university he published various mathematical works, including an edition of the first six books of Euclid, with a commentary, and contributed a number of articles on mathematical subjects to the "Edinburgh Encyclopædia" and the "Encyclopædia Metropolitana," and a series on the various branches of natural philosophy to the "Library of Useful Knowledge." In 1828 appeared his "Popular Lectures on the Steam Engine," for which he received a gold medal from the royal Dublin society. Upon the establishment of the London university he accepted the professorship of natural philosophy and astronomy; and fixing his residence in London in 1828, he published in the same year a "Discourse on the Advantages of Natural Philosophy," and an "Analytical Treatise on Plane and Spherical Trigonometry." This was followed by his "Cabinet Cyclopædia," commenced in 1830 and continued till 1844, embracing 132 vols. 12mo. In this work he secured the coöperation of the most eminent authors of the day. His own contributions comprised treatises on arithmetic, geometry, heat, hydrostatics and pneumatics, and mechanics. While engaged on this work he wrote occasional articles on physical science and its application to the useful arts for the periodicals, and was frequently before parliamentary committees as a witness in behalf of railway companies. In 1840 he eloped with the wife of Captain Heavyside, and came to the United States. He was sued for damages, and a verdict for £8,000 was entered against him. He married this lady after her husband's death. During five years' residence in America he delivered in the chief cities a series of lectures, which were published and have passed through many editions. On his return to Europe in 1845 he settled in Paris, where he resided until his death. Dr. Lardner's remaining works are: "Railway Economy" (1850); "Handbook of Natural Philosophy and Astronomy" (2 vols., 1851-2); "The Great Exhibition Reviewed" (1852); "The Museum of Science and Art," a series of popular treatises on the physical sciences and their application to the industrial arts, commenced in 1854, and completed in 12 vols. 12mo; and handbooks of "Natural Philosophy and Hydrostatics," of "Pneumatics and Heat," of "Natural Philosophy and Me-



chanics," of "Natural Philosophy, Electricity, Magnetism, and Acoustics," and of "Natural Philosophy and Optics" (1854-'6).

**LARDNER, Nathaniel**, an English divine, born at Hawkshurst, Kent, in 1684, died there, July 24, 1768. He belonged to the Presbyterian denomination, but entertained Unitarian opinions. He was educated at London, Utrecht, and Leyden, and was the author of many valuable theological works. That on which his fame chiefly rests is his "Credibility of the Gospel History" (5 vols. 8vo, 1727-'57), which is regarded as one of the ablest works upon that subject. There are two complete editions of Dr. Lardner's works, the last in 10 vols. 8vo (London, 1828), and the other in 5 vols. 4to (London, 1815).

**LARES**, a class of inferior divinities or protecting spirits in ancient Rome, domestic and public. Their worship was closely connected with that of the manes, but only the spirits of the good were honored as lares. The household lares were headed by the *lar familiaris*, who was revered as the founder of the family. When the latter changed abode, he followed them. The worship of the public lares is said to have been introduced by Servius Tullius; it was renewed by Augustus. They were considered as the protecting spirits of the city, and had a temple in the Via Sacra. There were others who were regarded as presiding over the several divisions of the city, over the rural districts, high roads, &c. In great houses the images of the household lares had their separate apartment, called *edicula* or *lararium*. Their worship was simple; they received offerings in *patella*, especially on the calends, nones, and ides of every month. On joyful occasions they were adorned with wreaths. (See PENATES.)

**LARIMER**, a N. county of Colorado, bordering on Wyoming territory, bounded W. by the Medicine Bow mountains, and intersected by the South Platte river; area, about 1,200 sq. m.; pop. in 1870, 838. The mountainous region in the west abounds in pine timber, and numerous streams, among which is the Cache à la Poudre, furnish water power. The E. part is undulating and adapted to agriculture. The chief productions in 1870 were 12,923 bushels of wheat, 9,354 of Indian corn, 40,213 of oats, 26,075 of potatoes, 34,190 lbs. of butter, and 3,174 tons of hay. There were 801 horses, 1,301 milch cows, 3,292 other cattle, 611 sheep, and 113 swine; 1 flour mill, and 3 saw mills. Capital, Laporte.

**LARISSA** (Turk. *Yenishehr*, new town), a town of European Turkey, in the vilayet and 75 m. S. S. W. of the city of Salonica; pop. about 20,000, more than half Turks, and the rest Greeks, Jews, &c. It is situated on a gently rising ground on the river Selembria (anc. *Peneus*), crossed here by a bridge of ten arches. It is the seat of a Greek archbishop and of a Turkish pasha, possesses some manufacturing establishments, and trades in the products of the country.—Larissa was an im-

portant town in the ancient Grecian province of Thessaly, and celebrated for its bull fights. It is said to have been founded by Acrisius, king of Argos. In process of time its inhabitants attained considerable power, and became lords of the surrounding plain, and the town the capital of Pelasgiotis. In the Peloponnesian war they supported Athens against Sparta. They were afterward reduced to subjection, in common with the other Thessalians, successively by the Macedonians, the Romans, and the Turks.

**LARISTAN**, a S. province of Persia, bordering on the Persian gulf, and bounded landward by Kerman and Fars; area, about 23,000 sq. m. In antiquity it formed a part of Carmania. It is one of the poorest divisions of the empire, consisting mainly of an arid sandy waste, with salt steppes and several mountainous elevations, the highest of which are Mounts Tcharek, Kor, Khalatu, and Nabend. There is a scarcity of water, the principal river being the Div-rud, and there is little or no agriculture beyond the raising of small quantities of wheat, barley, and dates. The coast is occupied by Arabs, who live under their own sheik, and pay an insignificant sum for tribute. Capital, Lar.

**LA RIVE. I. Charles Gaspard de**, a Swiss chemist, born in Geneva, March 14, 1770, died there, March 18, 1834. In 1794 he left Switzerland on account of the political disturbances, and went to Edinburgh, where he studied medicine and chemistry and became president of the royal medical society. He returned to Geneva in 1799, took charge of an insane asylum, and in 1802 was made honorary professor of pharmaceutical chemistry. He also became prominent in politics, and was a member of the representative council. He founded the museum of natural history, a botanic garden, and courses of public lectures. He was the first on the continent to make known the discoveries of Davy and other English physicists, and to construct a large galvanic battery. Many of his writings were published in the *Bibliothèque Britannique* and the *Bibliothèque universelle* of Geneva. **II. Auguste de**, son of the preceding, born in Geneva, Oct. 9, 1801, died in Marseilles, Nov. 27, 1873. He studied under his father, and became professor in the academy of Geneva, a correspondent of the French institute, a member of the London royal society, and editor of the *Bibliothèque universelle*. He vindicated by his experiments the electrochemical theory in respect to galvanic batteries. In 1842 he received the Montyon prize of 3,000 francs from the French academy of sciences for his inventions relating to galvanoplasty. In 1864 he was made one of the eight foreign associates of the French academy. His principal work is *Traité d'électricité théorique appliquée* (3 vols., Paris, 1854-'8).

**LARK**, a conirostral bird of the family *alaudidæ*, coming in many respects near the finches. The family characters are: a short and conical bill with the frontal feathers extending along

the sides; the first primary very short or wanting; the tarsi scutellate before and behind; the hind claw very long and nearly straight; the tertials greatly elongated beyond the secondaries and nearly as long as the primaries. The genus *Alauda* (Linn.) belongs to the old world,



Sky Lark (*Alauda arvensis*).

and is found on plains and cultivated lands, migrating to the south in winter; many species sing while rising into the air in large circles or in a perpendicularly spiral manner to a very great height; the flight is undulating; they walk and run with ease. The food consists of grains, small seeds, grasshoppers, gnats, and small worms; the nest is usually placed in the grass on the ground. The sky lark or field lark (*A. arvensis*, Linn.), so celebrated in poetry for its song, is very generally distributed over Europe, Asia, and northern Africa. It is about  $7\frac{1}{2}$  in. long and 15 in extent of wings; the general color of the upper parts in both sexes is light reddish brown with darker streaks, the fore neck the same with brownish black spots, the sides streaked with dusky, the lower parts dull white, an obscure brownish white band over the eye, the quills and the outer tail feathers edged with white, and the iris hazel. Though the plumage is dull, the form is elegant; its song is not finely modulated nor mellow, but it is exceedingly cheerful and prolonged, and in early morning sounding from on high when the bird is entirely out of sight; this, combined with its extraordinary power of flight, has associated the lark with the most delightful recollections of rural life. It would be very difficult to imitate its song musically; it is occasionally uttered when the bird is on the ground, but usually as it commences its flight; the character of its different strains is such that it is said that one accustomed to the song can tell whether the bird be ascending, stationary, or descending. When on the ground larks are in the habit of crouching, so as to be perceived with difficulty; they rarely if ever alight on trees. They begin to pair in early spring, at which time their song begins,

continuing until the middle of autumn; the four or five eggs are greenish gray, irregularly freckled with darker. The lark rests on the ground at night; its principal enemies are weasels and the smaller hawks. Its flesh is eaten, though inferior to that of the thrushes. It is often kept as a cage bird, even in America, as it sings nearly as well in confinement as when at liberty; to prevent injury from its soaring propensities, it is usual to pad the top of the cage.—The wood lark (*A. arborea*, Linn.) resembles the preceding in plumage, but is a smaller bird, being  $6\frac{1}{2}$  in. long, with an extent of wings of 12 in.; the habits are like those of the sky lark, except that it inhabits woody places and frequently perches on trees; the song, though less diversified, is more melodious, and has been considered inferior only to that of the nightingale; the eggs are pale yellowish brown, with darker lines and freckles.—The only genus of the family found in North America is *eremophila* (Boie), having no spurious first primary; it has a pectoral crescent and cheek patches of black. The American sky lark or shore lark (*E. alpestris*, Boie; genus *otocoris*, Bonap.) is about  $7\frac{1}{2}$  in. long, with an extent of wings of 14 in.; the color above is pinkish brown, streaked with dusky on the back; a broad band across the crown, patch from bill below the eye, crescent on throat, and tail feathers black; frontal band over eye, under parts, outer edge of wings, and tail white, and chin and throat yellow; the colors are lighter in some specimens than in others, especially in winter. The principal peculiarity in the plumage consists in two erectile pointed tufts of feathers on the sides of the head, somewhat resembling the ears of the owls. It is distributed from Labrador over the prairies and desert plains of North America, visiting the Atlantic states especially in winter, when



American Sky Lark (*Eremophila alpestris*).

it is very fat and much esteemed as food. Audubon found this lark breeding on the desolate shores of Labrador, making its nest in the mosses and lichens in the beginning of July; the eggs, four or five, are grayish, with numerous pale blue and brown spots; it returns

to the south in the early part of September. The song of the males on the wing is very sweet, though comparatively short. The food consists of seeds, insects, and larvæ, and minute crustaceans on the seashore.—Birds of the family *syvicolidæ*, of the genus *anthus* (Licht.), generally called larks, will be described under **TITLARK**; the red-breasted and meadow larks are starlings, of the family *icteridæ*, and will be noticed under **STARLING** and **MEADOW LARK**.

**LARKSPUR.** See **DELPHINIUM**.

**LARNAKA**, or *Larnica* (anc. *Citium*), the principal seaport town of the island of Cyprus, 23 m. S. E. of Nicosia; pop. about 10,000. In the lower town are the bazaars and the houses of the commercial classes, and in the upper town are a cathedral and a convent. Between these two parts are gardens and some relics of antiquity. Larnaka is filthy, like most Levantine towns, and the climate is unhealthy. The exports in 1872 were valued at £26,189, about one half madder, and the rest rags, cotton, sheep and goat skins, barley, and sumach.

**LARNED**, Sylvester, an American clergyman, born in Pittsfield, Mass., Aug. 31, 1796, died in New Orleans, Aug. 31, 1820. He received his collegiate education at Middlebury, Vt., studied theology at Princeton, N. J., and was ordained in July, 1817. His earliest efforts showed rare gifts of eloquence. In the autumn and winter following his ordination he proceeded to New Orleans by the way of Detroit, Louisville, and the Mississippi river, preaching whenever opportunity offered during the three months occupied in the journey. At New Orleans his eloquence made a profound impression. A church was soon organized, and a congregation collected, over which he was settled as pastor, and a large church edifice erected. In the summer of 1820 the yellow fever broke out with unusual violence, and he was urgently entreated to seek safety in flight; but he refused to desert the post of duty, and fell a sacrifice to his fidelity. A memoir of his life, with a collection of his sermons, was published in 1844 by the Rev. R. R. Gurley.

**LA ROCHEFOUCAULD**, François, duke de, prince of Marsillac, a French author, born in Paris, Dec. 15, 1613, died March 17, 1680. He was in boyhood withdrawn from school to enter the military service, and at the age of 16 was engaged as an officer at the siege of Casale. Of a naturally timid, irresolute, and melancholy character, as he himself has recorded, and unfitted to be a political partisan, he was immediately involved in the intrigues which distracted the court. His father was banished to Blois in 1632 for some connection with the revolt of Gaston of Orleans, and he himself shared his exile, being suspected of hostility to Cardinal Richelieu on account of his intimacy with the friends of Queen Anne of Austria. At Tours he met in 1637 the duchess de Chevreuse, then in correspondence with the queen and the Spanish court. He entered with zeal into the intrigues against the cardinal; obtained per-

mission to return to Paris at the moment when the queen, accused of communications with Spain, was subjected to a sort of judicial examination; and, in his devotion to her, accepted her proposal to guide her and Mlle. d'Hautefort in flight to Brussels. He had made preparations for this purpose, when he was discovered to have favored the flight of the duchess de Chevreuse into Spain, and was thrown into the Bastille. Released after eight days, he went into retirement at Verteuil, where he lived as a country gentleman, at the same time corresponding with the enemies of Richelieu and participating in the projects of Cinq-Mars and De Thou. He returned to the court after the death of the cardinal (1642), and was received with kindness, but, being unrewarded by the queen and Mazarin, showed his resentment by attaching himself to the duke d'Enghien and forming a *liaison* with his sister, the duchess de Longueville, his devotion to whom for several years was merely a matter of interest and calculation. In the wars and intrigues of the Fronde he served the party of the parliament, in the defence of Bordeaux (1650), and in the faubourg St. Antoine of Paris, and on the conclusion of peace abandoned the pursuits of ambition for a life of repose and reflection. He described his occupations thus far as a "business for fools and wretches, with which honorable and well-to-do persons should not mingle." To his relations with Mme. de Longueville succeeded the friendship of Mme. de Sablé, Mme. de Sévigné, and Mme. de Lafayette; and his house became a resort of those most distinguished for wit and culture, including Boileau, Racine, and Molière. The first fruit of his leisure was his *Mémoires* (Cologne, 1662; 3d ed., 1664), which are among the most interesting records of the intrigues against Richelieu and of the period of the Fronde. Three years later he published his *Réflexions, ou Sentences et maximes morales*, a volume of 150 pages containing 360 detached thoughts; the first book, according to Voltaire, written in Europe after the revival of letters in a lively, precise, and delicate style, and which contributed more than any other to form the taste of the French nation. The fundamental and pervading thought, that self-love is the motive of all human actions, is presented under such various aspects and with so much acuteness of observation, that every maxim is piquant and suggestive, though few of them may be true. Though his philosophy is not metaphysical, but founded on the ways of the world, and though his statements are rarely absolute, but applied only to the usual conduct of the greater number of persons, yet his persistent reduction of virtues into disguised vices justifies Rousseau in pronouncing it a "sad book." The only thing, La Rochefoucauld says, that is really injurious and justly condemned by men, is not vice, but crime. The *Maximes* passed through five editions in the lifetime of the author, and have been frequently republished. An excellent

edition, prepared by Gratel-Duplessis, and edited by Sainte-Beuve, appeared in Paris in 1853.

**LA ROCHEFOUGAULD-LIANCOURT, François Alexandre Frédéric**, duke de, a French statesman and philanthropist, born Jan. 11, 1747, died in Paris, March 27, 1827. Having fallen under the displeasure of Mme. du Barry, he found little inducement to attend the court of Louis XV., but passed his time chiefly on his estate of Liancourt, where, under the influence of a visit to England in 1769, he established a model farm. He also established there a school of arts and trades, which became the parent of the institution bearing the same name at Châlons. After the destruction of the Bastille in July, 1789, he was appointed president of the national assembly. His efforts to befriend the king, after the life of the latter had been menaced, having brought him into danger, he took refuge in England, and subsequently travelled in the United States and Canada. He returned to France in 1799, and for some years lived in obscurity in Paris. Still busy with philanthropic plans, he aided in introducing vaccination into France, and inaugurated the system of dispensaries in Paris. Napoleon admitted him to the chamber of peers, under his hereditary title. After the restoration he became a member of the general council of hospitals, and president of the society of Christian morals, in which capacity he labored to abolish the slave trade, and to suppress lotteries and gaming houses. He was inspector general of the school of arts and trades at Châlons for 23 years, and a member of various public bodies of an industrial and philanthropic character, from most of which he was removed by the ministry in 1823 in consequence of his liberal political views. The academy of sciences testified their disapprobation of this persecution by admitting him a member, and the academy of medicine appointed him on the commission destined to replace the committee of vaccination, of which he had been president, and which had been suppressed by government. He subsequently inaugurated the system of schools for mutual instruction, and established the first savings bank in France. He was a voluminous writer, and among his publications are works on pauperism, on public instruction, on savings banks, on prison discipline, &c. Among the fruits of his visit to America were an account of the prisons of Philadelphia (Philadelphia and Paris, 1796), and *Voyage dans les États-Unis de l'Amérique* (8 vols., Paris, 1800).

**LA ROCHEJAQUELEIN. I. Henri du Verger**, count de, a French royalist, born in the château of La Durbelière, near Châtillon-sur-Sèvres, Poitou, in August, 1772, killed at Nouaillé, March 4, 1794. He was educated at the military school of Sorèze, and after the outbreak of the French revolution entered the constitutional guard of Louis XVI.; but after the massacre of the Swiss guards, Aug. 10, 1792, he retired to Poitou, and joined the marquis de Lescuré in the movement organized among the

people of La Vendée for the reestablishment of the monarchy. The peasantry having determined to select their leaders from the provincial nobility, the parishes around Châtillon chose La Rochejaquelein, who joined his followers at St. Aubin in March, 1793, and addressed them in a brief speech, ending with these words: "I am young and without experience; but I burn to show myself worthy to be your commander. Let us meet the enemy. If I advance, follow me; if I retreat, kill me; if I fall, avenge me!" The peasants, animated by his example, on the succeeding day attacked the republicans at Aubiers with irresistible force; and having effected a junction with the royalists of Anjou, they defeated the enemy in several encounters. At the attack upon Thouars, May 4, La Rochejaquelein, mounted upon the shoulders of Texier de Courlai, helped to detach with his own hands some of the stones from the wall, and was the first to mount it. At the battle of Fontenay, May 16, and the siege of Saumur in June, he showed equal intrepidity. In a short time the royalist troops had taken 80 pieces of cannon and 12,000 prisoners, with the loss of fewer than 500 killed and wounded. In the less fortunate engagements at Luçon and Cholet, at which the chief Vendean leaders were killed or disabled, La Rochejaquelein performed prodigies of valor; and upon the assembling of a new army at Varades, on the northern bank of the Loire, whither the Vendéans had fled after their defeat at Cholet, he was chosen generalissimo, as the only one capable of reviving the spirits of the troops. Accepting with reluctance this responsible trust, which seemed incompatible with his extreme youth, he marched toward the coast of Brittany in the expectation of meeting there promised succors from England. In October he occupied Laval, driving out a large body of national guards, and immediately after sustained an attack by the republicans under Lechelle, which resulted in one of the most glorious victories for the Vendéans during the war. The enemy were driven in scattered parties as far as Nantes and Rennes, losing 12,000 men and 19 pieces of cannon. Elated by their success, the royalists, 30,000 strong, attacked Granville, Nov. 14; but having no artillery with which to breach the ramparts, they received an unexpected check and were obliged to fall back with the loss of 1,800 men. This disaster disconcerted the plans of La Rochejaquelein, who was about to advance to Caen; and to add to his embarrassment a revolt broke out among his hastily assembled levies, whom it required all their commander's powers of persuasion to prevent from returning at once to their homes. As it was, a retrograde march toward the Loire had to be conceded to them. On their way they defeated a large body of republicans at Pontorson; but the latter, having rallied at Dol, Nov. 21, where they were largely reinforced, opposed the royalists with 35,900 men and a numerous park of artillery.

The first attack of La Rochejaquelein's troops was irresistible, and the republicans were driven several leagues beyond the town. But here the left wing of the royalists, disordered in pursuit, was assailed in turn by the republican right and driven back in confusion into the town. A panic seized the whole royalist army, and their leader, after vain endeavors to stay their flight, threw himself in despair in front of a hostile battery in the hope of finding an honorable death. But a Vendean priest holding a crucifix in his hand succeeded by an appeal to their religious enthusiasm in rallying 2,000 of the fugitives; the combat was renewed, and the republicans were routed in all quarters and fled toward Rennes, leaving 6,000 killed and wounded on the field. They, however, almost immediately concentrated at a strongly fortified position before Antrain, where another battle ensued, resulting in a complete victory for the Vendéans. On this occasion La Rochejaquelein interfered to prevent his troops from retaliating upon their prisoners the acts of cruelty perpetrated by the republicans. Again the Vendean leaders projected an advance toward the coast for the purpose of opening communications with the English, and again they were compelled by open mutiny among their followers to continue their march toward the Loire. Arriving at Angers Dec. 3, they made a desperate but unsuccessful attack upon the place; and, wearied, disheartened, and encumbered by an immense and fast increasing train of sick and wounded, they retreated toward La Flèche, which La Rochejaquelein entered by a *coup de main*, and thence proceeded to Le Mans. Here they were attacked, Dec. 12, by 40,000 republicans under Marceau, Westermann, and Kléber, and, although reduced to about 12,000 men fit for duty, they confronted their enemies with unflinching resolution. Owing to the skilful dispositions of La Rochejaquelein, the republicans were for a long time held in check outside the walls; but gradually they forced their way into the town, and for hours a terrible night conflict was maintained within the streets. Finally the royalists were overpowered and forced out of the town in a confused mass. Their leader, who had two horses killed under him and was wounded and overturned in the tumult, endeavored in vain to bring them to a final stand, and was borne off with his followers, who dispersed in various directions, leaving their baggage and almost all their artillery in the hands of the victors. La Rochejaquelein assembled the small remnant of his troops at Laval, Dec. 14, whence they moved to Ancenis to attempt the passage of the Loire. Here he embarked in a small boat with a few of his men for the purpose of seizing some large vessels on the opposite side of the river; but being attacked by a numerous party of republicans, his men were killed or dispersed, and he was obliged to gain refuge in a neighboring forest. Thenceforth he led the life of a parti-

san chief, gathering around him a band of followers, with whom he frequently sallied forth from his lurking places upon the republican posts. On one of these occasions, his men being about to fall upon two republican grenadiers, he ran forward exclaiming: "Surrender! I give you quarter," and was immediately shot dead by one of them. His comrades buried him upon the spot, but his body was afterward interred in the cemetery of St. Aubin. Although not 22 years of age at the time of his death, he was recognized as the main support of the royalist cause in western France. **II. Louis du Verger**, marquis de, commander of the last Vendean army, brother of the preceding, born Oct. 30, 1777, killed at Pont-des-Mathis, June 4, 1815. He emigrated with his father, the marquis de La Rochejaquelein, at the commencement of the revolution, and, after being employed in the military service of Austria and England, returned in 1801 to France and married the widow of the marquis de Lescuré, one of the bravest of the Vendean leaders. He aided in the restoration of the Bourbons in 1814, and after protecting the flight of Louis XVIII. to Ghent in March, 1815, landed at St. Gilles on the Vendean coast, and aroused the ancient enthusiasm of the inhabitants in behalf of the royal cause. With a few thousand men he encountered an imperial division under Gen. Travot near the village of Mathis, and was killed at the commencement of the action.—His son HENRI AUGUSTE GEORGES (1805-'67) was conspicuous during the reign of Louis Philippe and the second republic as leader of the democratic legitimists, but abandoned his party after the *coup d'état* of Dec. 2, 1851, and was made a senator by Napoleon III. **III. Marie Louise Victoire de Donnissan**, marchioness de, wife of the preceding, born in Versailles, Oct. 3, 1772, died in Orleans, Feb. 15, 1857. With her first husband, the marquis de Lescuré, she shared in the horrors attending the war in La Vendée, and, after the final rout of the royalists at Savenay, escaped almost by a miracle. After the death of the marquis de La Rochejaquelein she resided in Orleans. Her *Mémoires* (Bordeaux, 1815) present a vivid picture of the revolution in the west of France, derived from her personal experiences.

**LA ROCHELLE.** See ROCHELLE.

**LA ROMANA, Marquis.** See ROMANA.

**LAROMIGUIÈRE, Pierre**, a French philosopher, born at Livignac-le-Haut, Guienne, Nov. 3, 1756, died in Paris, Aug. 12, 1837. He was a member of the congregation of *doctrinaires*, and from 1774 to 1783 taught the classics and philosophy in various colleges in the south of France. He held the chair of philosophy in the college of Toulouse from 1784 till the suppression of the religious communities in 1790. Removing to Paris, he became associated with Sieyès and other leaders of the national assembly. In 1795 he was appointed professor of philosophy in the Prytaneum (lyceum of Louis XIV.), and in the following year was elected a



member of the academy of moral and political sciences. In 1811 he was called to the chair of philosophy in the faculty of letters at Paris. His professorship was filled by a deputy from 1813, but he continued to be librarian of the university. His philosophical system is a modification of that of Condillac. His principal work is the *Leçons de philosophie* (2 vols., 1815-'18), which embraces the lectures delivered by him in 1811 and 1812, and has been from its first appearance adopted for public instruction in France. In later editions other important writings have been included.

**LARREY. I. Dominique Jean**, baron, a French surgeon, born at Baudéan, near Bagnères-de-Bigorre, in July, 1766, died in Lyons, July 25, 1842. He studied medicine and surgery at Toulouse, and in 1787 went to Paris, where he was appointed surgeon to a frigate, in which he visited America. After returning to France he became an army surgeon (1792), and served during the wars of the revolution. It was at this time that he invented the *ambulances volantes*, for which he was rewarded with promotion to the rank of surgeon-in-chief. In 1798 he accompanied the French army to Egypt, where at Aboukir and Alexandria he displayed remarkable bravery. At Austerlitz he attended to the wounded under the heaviest fire; at Eylau he saved a great number of wounded by his daring; at Essling he killed his own horses to make soup for the wounded when other food was wanting; on the battle field of Wagram he received the title of baron; while in Spain and in Russia he extended the same care to the enemy's wounded as to those of the French. At the battle of Waterloo he was wounded, carried as a prisoner from post to post, and was about to be shot when he was recognized by a Prussian soldier and led to Blücher, the life of whose son he had formerly saved, and by whom he was sent under escort to Louvain. On the restoration he was summoned by the emperor Alexander to Paris. He was deprived of his pension, but was made surgeon-in-chief of the royal guard. His pension was restored to him in 1818 by special resolution of the chamber. Napoleon in his will left Larrey 100,000 francs. "If the army ever erect a monument of gratitude," said the emperor, "it should be to Larrey." Two statues were afterward raised to him, one in 1850 in the court of the Val-de-Grâce hospital, another in the hall of the academy of medicine. After the revolution of July he travelled in Belgium, southern France, and Italy, for the purpose of studying epidemics. In 1842 he was engaged in inspecting the hospitals in Algeria, where he was attacked by pneumonia; he hastened to return to Paris, but died on the road. His discoveries relative to gun-shot wounds; cholera, ophthalmia, tetanus, extraction of foreign bodies from the brain, and amputations, were all of the highest importance. There were few branches of surgery on which he did not advance new and valuable views. He was the

author of a great number of medical works and memoirs, many of which have been translated into foreign languages. **II. Félix Hippolyte**, baron, son of the preceding, born in Paris, Sept. 18, 1808. He served as a surgeon with the French army at the siege of Antwerp in 1830, became professor of pathology at the Val-de-Grâce in 1841, and was surgeon in ordinary to Napoleon III., and chief surgeon in the Italian campaign of 1859. In 1867 he was elected a member of the academy of sciences. His writings consist chiefly of reports and contributions to periodicals.

**LA RUE**, a central county of Kentucky, drained by Rolling fork of Salt river; area, 182 sq. m.; pop. in 1870, 8,235, of whom 965 were colored. It has a rolling surface and a good soil. The Louisville and Nashville railroad skirts the S. W. border, and the Knoxville branch passes through the county. The chief productions in 1870 were 61,537 bushels of wheat, 314,424 of Indian corn, 70,807 of oats, 368,100 lbs. of tobacco, and 110,964 of butter. There were 3,046 horses, 1,783 milch cows, 2,850 other cattle, 9,064 sheep, and 19,670 swine; 4 distilleries, 4 flour mills, and 3 saw mills. Capital, Hodgenville.

**LARVA**, the first and much the longest stage of the life of an insect, after emerging from the egg. The form is wingless, generally elongated and worm-like, known as the caterpillar, grub, or maggot, according to the order of the insect. In this stage most of the time is spent in eating, and the growth is very rapid, with frequent change of the skin. After a time this state passes into that of the pupa or chrysalis. (See CATERPILLAR.)

**LARYNX**. See LUNGS.

**LA SALLE. I. A S. W.** county of Texas, intersected by the Rio Frio and the Rio Nueces; area, 1,400 sq. m.; pop. in 1870, 69. Water is scarce, and the county is not adapted to agriculture, but grazing may be successfully pursued. Fort Ewell, a government post, is within its limits. In 1870 the county produced 26,000 lbs. of wool, and there were 140 horses, 5,000 sheep, and 11,100 cattle. **II. A N.** county of Illinois, traversed by the Illinois river and its affluents, the Fox and Vermilion; area, 1,050 sq. m.; pop. in 1870, 60,792. It has an undulating surface, occupied chiefly by prairies, but in some places well timbered, and abounds in coal mines. It is traversed by the Illinois Central and several other railroads. The chief productions in 1870 were 273,374 bushels of wheat, 48,308 of rye, 3,077,028 of Indian corn, 1,509,642 of oats, 86,635 of barley, 325,953 of potatoes, 66,803 lbs. of wool, 1,240,386 of butter, 151,055 of cheese, and 97,273 tons of hay. There were 24,673 horses, 17,605 milch cows, 29,338 other cattle, 17,200 sheep, and 36,717 swine; 8 manufactories of agricultural implements, 7 of brick, 27 of carriages, 1 of dressed flax, 1 of window glass, 5 of iron castings, 3 of machinery, 1 of organs, 1 of linseed oil, 14 of saddlery and harness, 4 of

sash, doors, and blinds, 1 of woollen goods, 12 flour mills, 1 tannery, 1 currying establishment, and 6 breweries. Capital, Ottawa.

**LA SALLE**, a city of La Salle co., Illinois, situated at the head of navigation on the Illinois river, at the terminus of the Illinois and Michigan canal, and at the intersection of the Illinois Central and the Chicago, Rock Island, and Pacific railroads, 80 m. W. S. W. of Chicago; pop. in 1860, 4,016; in 1870, 5,200. It is built on a bluff rising from the river, and enjoys a pleasant and healthful situation and great facilities for trade. The river, here 900 ft. wide, is crossed by a railroad bridge of 20 arches. The surrounding country is fertile, and abounds in bituminous coal, of which large quantities are shipped from this point. There are extensive zinc works, breweries, flouring mills, founderies and machine shops, glass works, &c. It has graded public schools, including two high schools, two weekly newspapers, and five churches.

**LA SALLE, Jean Baptiste**, founder of the "Brothers of the Christian Schools," born in Rheims, April 30, 1651, died in Rouen, April 7, 1719. He was appointed a canon of the cathedral of Rheims in 1669, and the next year went to St. Sulpice, Paris, to complete his course of theology. In 1671 he was ordained priest, and forthwith resolved to devote his whole life to the improvement of the working classes. He began by obtaining a royal charter for a sisterhood already established in Rheims, destined to teach exclusively the poor children of their sex. He then engaged in founding a brotherhood devoted to the instruction of poor boys, and with a few associates opened schools in two of the parishes of Rheims. The number of these schools increased rapidly, and he united the teachers in a common residence, giving them a distinctive dress of the coarsest material, and a few simple rules to be observed by all. In order to encourage his followers to practise religious poverty, he renounced his prebend in favor of a poor priest, distributed his patrimony in alms, and thenceforward taught daily in the schools. The new brotherhood spread rapidly throughout France. In Paris the secular teachers sued him before the courts, and compelled him to leave the city. At Rouen he purchased the establishment of St. Yon, which became the central house of the brotherhood. (See BROTHERS OF THE CHRISTIAN SCHOOLS.) The canonical process of his beatification is nearly completed at Rome. He left several works, among which two have been frequently reprinted: *Les règles de la bienséance et de la civilité chrétiennes*, and *Les douze vertus d'un bon maître*.

**LA SALLE, Robert Cavalier**, sieur de, a French explorer, born in Rouen in November, 1643, killed in Texas, March 19, 1687. He is said to have forfeited his patrimony by becoming a Jesuit; but he withdrew from the order, and went to Canada early in 1666. He settled at Montreal, and from the Sulpicians, seigneurs

of the island, to which body his brother Jean belonged, obtained a grant of land and founded La Chine. He soon disposed of this, and in 1669 started on an exploring expedition with the Sulpicians Dollier de Casson and Galinée; but after visiting the Seneca country he parted with them near the head of Lake Ontario, on the Canada side, on account of illness. He is then said to have returned to the Iroquois country, reached the Ohio, and descended it to the falls where Louisville now stands. An assertion made recently that about this time he descended the Illinois to the Mississippi rests on an anonymous statement of conversations, and is unsupported by his own petitions and documents as to his discoveries. After Frontenac established Fort Frontenac, on Quinté bay, La Salle went to France in the autumn of 1674, with strong commendatory letters from the governor general to Colbert. He was received with favor, ennobled, obtained a grant of the fort and adjacent lands, and was made governor of the fort and settlement, May 13, 1675. He replaced the palisade fort with one of cut stone, gathered French and Indian settlers around it, and soon had four decked vessels on the lake, making his post the centre of the fur trade, on which he now entered; and Canada became divided into two great antagonistic organizations, both grasping at a monopoly of the peltries. With a view of extending his operations to the west, and perhaps finding a way to the western ocean and China, he returned to France, and in May, 1678, obtained permission to carry on western explorations for five years, build and hold forts, and enjoy a monopoly of the trade in buffalo skins, but was expressly forbidden to trade with the Ottawas or other lake tribes who had been accustomed to bring furs to Montreal. With Tonty, an Italian veteran, and 30 mechanics and mariners, he sailed from La Rochelle on July 14, and proceeded to Fort Frontenac. He sent Tonty to establish a post near the mouth of the Niagara, gained the good will of the Senecas, and began to build a vessel of 55 tons, above the falls, apparently at Cayuga creek. The Griffon was launched in 1679, and in August he embarked with his expedition, including three Franciscans. He sailed through Lakes Erie, St. Clair, Huron, and Michigan to Green bay. As his creditors had during his operations been proceeding against him, he unwisely collected furs in defiance of the terms of his grant, and sent back a load by the Griffon to meet their claims. His party then proceeded in canoes to the mouth of the St. Joseph's river, where he established a trading house, called Fort Miami. He then ascended the St. Joseph's, crossed to the Kankakee, and sailed down till he reached an Illinois village. He formed an alliance with the tribe, and in January, 1680, began near the present Peoria a post which he called Fort Crèvecoeur. The Griffon never returned from her voyage down, and La Salle was deprived of much that he

needed for his explorations. After putting Tonty in command at his fort, and despatching Acau and Hennepin to explore the Illinois to its mouth, he himself started back for Canada with five companions. From the mouth of the St. Joseph's he struck across Michigan to a river flowing into the Detroit, crossed that river, made his way overland to Lake Erie, and then proceeded in a canoe to his post at Niagara. Here he was convinced that the Griffon had perished, and heard of the loss of a ship on its way from France with supplies. Arranging his affairs as best he could, he made up a fresh party, and started back for Fort Crève-cœur with supplies; but on arriving he found that Tonty, by the attack of the Iroquois on the Illinois, and by the desertion of his men, had been forced to abandon the post and retire to Green bay. La Salle went down the Illinois to its mouth, and returned to gather his followers and obtain resources to renew his exploration, although De la Barre, Frontenac's successor, was openly hostile to him and aided his enemies. At last, Dec. 21, 1681, he started from Fort Miami with his expedition, ascended the Chicago, crossed to the Illinois, and descended to the Mississippi. Sailing down, he camped on the first Chickasaw bluff, stopped at the Arkansas villages, and kept on till the river divided. He explored the three channels to the gulf, and on April 9, 1682, set up a column with the French arms at the mouth, and took formal possession of the country watered by the river. Returning, he began Fort St. Louis at Starved Rock, on the Illinois, and in November, 1683, reached Quebec, leaving Tonty in command in the west, with instructions to meet him at the mouth of the Mississippi. He then proceeded to France, and proposed to the government to begin a settlement there, and to undertake the conquest of New Biscay and the rich mining country of northern Mexico. By patent of April 14, 1684, he was appointed commandant of all the country from Fort St. Louis, in what is now the state of Illinois, to New Biscay. An expedition consisting of 280 persons, most of them ill chosen, sailed from Rochefort on Aug. 1, in four ships; but dissensions at once sprang up between La Salle and Beaujeu, the naval officer in command of the vessels. After stopping at Santo Domingo, they entered the gulf of Mexico, but, miscalculating distances, passed the mouth of the Mississippi, apparently on Jan. 10, 1685. As they advanced, La Salle, convinced that they had gone too far, wished to return, but Beaujeu went on. They finally anchored off the entrance to Matagorda bay. Here La Salle disembarked his colonists, but his store ship *Aimable*, containing most of his munitions, was run on an island and wrecked. Beaujeu, pleading a want of provisions, soon after sailed off with two vessels, leaving La Salle with the *Belle*, a small vessel given him by the king. La Salle then threw up a fort called St. Louis, and attempted to cultivate the

soil. The Indians showed hostility from the first. Some of the settlers were killed, others perished from diseases and imprudence. La Salle lost time and men in excursions through the country; the *Belle* was wrecked; and after the lapse of two years the whole party, in January, 1687, was reduced to fewer than 40. Leaving half of these, including the women and children, in the fort, La Salle set out on Jan. 7 to make his way to the Illinois, with his brother, his nephews, Joutel, and 12 others. He had already visited the Ceniz or Assinai, and now pushed on for their towns. He had crossed the intervening rivers and reached the Trinity, when a long smothered revolt broke out. Duhant and Larchevêque killed Morangé, a nephew of La Salle; and when the commander turned back to look for his relative, they shot him down, and as they looked at the body cried, "There, you grand bashaw, there you are!" The murderers soon after quarrelled among themselves, and Joutel with the Cavaliers and four others, started on, and finally reached a French post on the Arkansas. Of those left at Fort St. Louis nearly all were massacred by the Clamcoet Indians, the few survivors falling into the hands of a Spanish force sent to drive out the French.—The career of La Salle was, in and immediately after his day, the subject of conflicting statements, and controversies have been maintained to this day. Hennepin, Le Clercq, Joutel, and Tonty gave contemporaneous statements; and in recent times the subject has been specially treated by Sparks, "Life of La Salle;" Shea, "Discovery of the Mississippi;" Parkman, "Discovery of the Great West;" and Gravier, *Découvertes et établissement de Cavalier de la Salle*.

**LAS ANIMAS**, the S. E. county of Colorado, bounded E. by Kansas, S. by Indian territory and New Mexico, and W. by the Rocky mountains; area, about 7,000 sq. m.; pop. in 1870, 4,276, chiefly Mexicans. It is watered by the Las Animas or Purgatory river and by branches of the Arkansas. The valley of the Purgatory is very fertile. The *mesas* or table lands afford excellent pasturage. The chief productions in 1870 were 5,930 bushels of wheat, 2,952 of Indian corn, and 10,650 lbs. of wool. The value of live stock was \$31,801. Capital, Trinidad.

**LASAUUX, Ernst von**, a German philologist, born in Coblenz, March 16, 1805, died in Munich, May 10, 1861. He was the son of an architect, studied in Bonn and Munich, spent some time in Rome and the East, and was professor of philology at Würzburg from 1835 to 1844, and subsequently at Munich. In the Bavarian chamber he was conspicuous as an ultramontane. His principal works are: *Der Untergang des Hellenismus* (Munich, 1854); *Ueber die theologische Grundlage aller philosophischen Systeme* (1856); and *Die Philosophie der schönen Künste* (1860).

**LASCARIS, I. Andreas Joannes**, surnamed RHYNDACENUS, a Greek philologist, born on the banks of the Rhyndacus in Phrygia about

1445, died in Rome in 1535. He belonged to a family which counted among its members three Greek emperors reigning at Nicæa, viz.: Theodore I., 1206-'22; Theodore II., 1255-'9; and John IV., 1259-'61. He went to Italy on the final overthrow of the Byzantine empire, and found a refuge at the court of Lorenzo de' Medici, who sent him twice to Greece to collect valuable manuscripts. Before his return the second time Lorenzo died, and Lascaris, at the invitation of Charles VIII. of France, removed to Paris about 1495, and began to teach Greek publicly. In 1503 and 1505 Louis XII. sent him as ambassador to Venice; and on the rupture between France and Venice in 1508 he remained there as a private citizen. In 1513, on the invitation of Leo X., he took charge of the Greek college and press lately founded in Rome, and published editions of many of the Greek classics. In 1518 he returned to Paris, and assisted Budeus in forming the royal library at Fontainebleau. He was subsequently sent to Venice to procure Grecian youths to officiate in the Greek college contemplated by Francis I. Paul III. importuned him to return to Rome, and he died a few months after his arrival there. He edited the works of several of the Greek poets, and translated into Latin some military treatises of Polybius.—See Villemain, *Lascaris* (Paris, 1825). **II. Constantine**, a Greek grammarian, of the same family with the preceding, born in Constantinople, died in 1493. On the capture of his native city by the Turks he repaired to the court of Francesco Sforza, duke of Milan, who intrusted him with the education of his daughter. He taught Greek and rhetoric in Rome and Naples, and subsequently established in Messina a school which enjoyed great celebrity while he lived. He bequeathed his library and manuscripts to the senate of Messina. These were afterward carried to Spain, and are still preserved in the Escorial. His *Grammatica Græca* (Milan, 1476) was the first Greek book printed in Italy.

**LAS CASAS, Bartolomé de**, the apostle to the American Indians, born in Seville, Spain, in 1474, died in Madrid in July, 1566. His father accompanied Columbus both on his first and second voyages, and on the latter of these took with him his son, then 19 years of age, who till that time had pursued his studies with brilliant success at Salamanca. Bartolomé went also on the third and fourth voyages of Columbus. On his return to Spain he entered the order of the Dominicans, with a view of being employed as a missionary to the Indians. He went to Santo Domingo in 1502, was ordained there in 1510, and celebrated the first high mass that had ever been heard from a priest ordained in the new world. Two years afterward he accompanied Velasquez to Cuba as his chaplain, and attracted attention by the influence which his mildness and charity gained over the native population. He entered with

zeal into the interests of the unfortunate Indians oppressed by their European conquerors, and in 1515 sailed for Spain to obtain for them measures of redress. Cardinal Ximenes, who in the following year became regent, sent out three Hieronymite monks to correct the abuses complained of; but the efforts of this commission not satisfying the devotion of Las Casas, he soon returned again to Spain for stricter and more efficient regulations, and was appointed "universal protector of the Indies." At last, to save the Indians from the complete extermination which threatened them, Las Casas, who had seen the African thriving and robust beneath the sun of Hispaniola, proposed the introduction of negro slaves to labor in mines and on sugar plantations; and relieve the natives. The plan which benevolence had suggested was quickly caught up by the colonists, the traffic in negroes became a lucrative commerce, and the servitude of one race was only given up for that of another. Seeing the failure and perversion of his plan, Las Casas formed the project of establishing a colony under his own guidance, and obtained from Charles V. the gift of 270 leagues of land on the coast of Venezuela for this purpose. This plan too failing after a short trial, he retired for a time in despair to the Dominican convent at Santo Domingo. In 1527 he went as missionary and preacher through the provinces of Nicaragua and Guatemala, and into Peru and Mexico; after which in 1539 he returned to Spain to explain to the emperor the situation of the Indies and to obtain from him new reforms. Charles V., wishing to reward him for his many labors, appointed him to the rich bishopric of Cuzco. Las Casas declined this appointment, but accepted the next year the much poorer bishopric of Chiapas, in Mexico; and at the age of 69 years he left Spain for the eighth time. His zeal in behalf of the Indians provoked a hostile attack from Sepulveda, an officer of the Spanish court, who undertook to justify the conduct of the Spaniards. To defend himself Las Casas wrote his work upon the destruction of the Indies, which contained many particulars of cruelties by the colonists, and was translated into several European languages. He met with difficulties in the administration of his bishopric, and having refused the sacraments to those of the colonists who reduced the Indians to slavery, he drew upon himself not only the hostility of the planters, but also the disapproval of the church. Abandoned by all, he returned finally to Spain in 1551, after having during 50 years signalized in America his zeal and his virtues. He retired to the convent of St. Gregory in Valladolid, and devoted the remainder of his life to various compositions, one of the most valuable of which, his "General History of the Indies," commenced in 1527, has never been published. Several other works in Spanish, and two in Latin, also remain unpublished. The printed works were published in 1 vol. 4to (Seville, 1552). Several of his works were edited by

Llorente, and published in Spanish and French, each edition in 2 vols. 8vo (Paris, 1822).

**LAS CASES, Emmanuel Augustin Diendonné**, seigneur de la Caussade and count de, a French historian, and companion of Napoleon at St. Helena, born at the château of Las Cases, near Revel, Languedoc, in 1766, died at Passy-sur-Seine, May 15, 1842. He was educated at the school of the Oratorians in Vendôme, and at the military and naval schools of Paris, and served in the navy, becoming lieutenant at the age of 21. When the revolution broke out he took part with the royalists, emigrated, and was employed by the prince of Condé in many diplomatic missions, among others to Gustavus III. of Sweden, then at Aix-la-Chapelle, who became his friend. After the defeat of the Prussians in Champagne he fled to London, where he supported himself by teaching. When the *émigrés* were recalled by Napoleon, Las Cases returned to Paris, and for some time lived in obscurity. But he was appointed chamberlain of the emperor in 1808, and in 1809 entered the army of Bernadotte. In 1810 he was appointed master of requests in the council of state, and in 1811 intrusted with the liquidation of the Austro-Illyrian debt. In 1812 he was appointed inspector of prisons, hospitals, and similar institutions, and of all the ports and naval stations from Toulon to Amsterdam. After the disasters of Moscow and Leipsic, Las Cases commanded the 10th legion of the national guard. In 1814 he opposed Napoleon's abdication, and went to England, whence he subsequently sent in his adhesion to the Bourbons. After the return from Elba he went back to France, and after Waterloo followed Napoleon to St. Helena. Here with his son he devoted himself to the care of the emperor, and passed his evenings in recording his remarks. Having written a letter to Lucien Bonaparte commenting on the treatment to which Napoleon was subjected, he was arrested, Nov. 27, 1816, and sent to the Cape of Good Hope, where he was confined eight months. He was taken to England, but not suffered to land, and afterward conducted to Frankfort, where he at last received his liberty after 13 months' captivity. He afterward resided in Belgium, but it was not until the death of Napoleon that he was allowed to return to France. He now published his St. Helena notes, which are said to have yielded him 2,000,000 francs. He was elected in 1831 and 1839 to the chamber of deputies, taking his seat with the ultra opposition. Besides his *Mémorial de Sainte-Hélène* (8 vols., 1822-'3), he composed an *Atlas historique et géographique* (1803-'4), and an autobiography entitled *Mémoires d'E. A. D., comte de Las Cases, communiqués par lui-même* (1819).

**LAS CENZAS** ("the ashes"), a volcano in Guatemala, Central America, one of the group known as the volcanoes of Pacaya, in lat. 14° 21' N., lon. 90° 36' W., 19 m. S. W. of the city of Guatemala; altitude, 5,100 ft. It has not been

in a state of destructive eruption since 1776, in which year it destroyed the village of Tres Rios, 9 m. distant, filling up three considerable rivers, from which the village took its name.

**LASKER, Eduard**, a German statesman of Jewish parentage, born at Jarocin, Posen, Oct. 14, 1829. He studied in Breslau, and found employment in the judiciary service at Berlin, with which he resumed his connection in 1856, after having passed some time in London in studying English jurisprudence. He became known as a statesman by his work on the constitutional history of Prussia (new ed., Leipsic, 1873), and as a member since 1865 of the Prussian chamber, and subsequently of the North German and German imperial parliaments. He was one of the founders of the national liberal party, and promoter of the union of the southern and northern states of Germany (1866-'70). He is now (1874) the foremost leader in the Reichstag, and a powerful supporter of Bismarck's policy.

**LASKI, Jan**, commonly known as JOHN À LASCO, a Polish divine, born in Warsaw in 1499, died in Pinczów, Jan. 13, 1560. He was descended from a noble family, and had an uncle who was an archbishop. He entered the church, and rose to the rank of bishop; but having made the acquaintance of Zwingli and other reformers, he became a Protestant, and resigned his bishopric in 1537. After founding at Emden the first Protestant church in that region, he went to London in 1549, where he had charge of a foreign Protestant congregation. Being compelled to leave England on the accession of Mary in 1553, he went to Frankfort, where he organized the society of Protestant refugees from England and the Netherlands. He returned to his native country in 1556, became the head of the Protestant church in Little Poland, and exerted himself especially to bring about a union of all the Protestant churches of Poland. He left a large number of theological works.

**LAS PALMAS.** See PALMAS.

**LAS PILAS**, one of the great extinct volcanoes which constitute the volcanic chain of the Marrabios, extending across the plain of Leon, in Nicaragua. It is broad and comparatively low, but has a vast crater surrounded by many smaller craters, or ancient vents. It was near the foot of this volcano, in the plain of Leon, that a volcanic orifice opened on April 12, 1850, around which was speedily accumulated a great mass of lava, cinders, stones, and ashes, forming a cone several hundred feet in height, which by its accretions promised to add another high volcano to those which stud the plain. The eruption ceased however at the end of a month, and has not since been renewed.

**LASSA**, or **H'Lassa**, a city of Asia, capital of Thibet, situated in a fertile plain on an affluent of the Sanpo or Dzang-bo-tzin, in lat. 30° 48' N., lon. 91° 25', 600 m. N. N. E. of Calcutta; pop. about 50,000, a large portion of whom are Buddhist priests or lamas. The streets are



in general wide and regular, and the houses, whether constructed of mud, brick, or stone, have their walls whitened, and their doors and window frames painted red and yellow. It is surrounded with a wall, and contains some fine public edifices, the chief of which is a lamasery or monastery. Lassa is a place of considerable commerce, and the resort of merchants from all parts of Asia. The most important articles of trade are linens, woollen cloth, cashmere shawls, sable furs, raw silk, musk, sugar, dried fruits, bullion, glass, and cutlery. N. W. of the city, and connected with it by two avenues, is the Buddhala, or "mountain of Buddha," on which stands the palace of the grand lama, a magnificent structure four stories high, crowned by a gilded dome, and supported by columns covered with plates of gold. This is the residence of the dalai lama or grand lama, the Buddhist sovereign pontiff of central Asia. Thither pilgrims resort from all parts of eastern Asia to perform their devotions, and do homage to the supposed incarnation of deity.

**LASSEN**, a N. E. county of California, bordering on Nevada, and intersected in the N. W. by the upper Sacramento; area, 4,932 sq. m.; pop. in 1870, 1,327. It lies E. of the Sierra Nevada mountains, and contains several lakes, the most noteworthy of which is Honey lake, which receives Susan river and Willow creek. The mountain slope is covered with pine forests; at the base are the lakes and meadows, while further E. are sage brush hills and plains. Portions of the county are adapted to agriculture and grazing. The chief productions in 1870 were 12,904 bushels of wheat, 36,497 of oats, 93,926 of barley, 59,494 lbs. of wool, and 9,120 tons of hay. There were 2,022 horses, 1,791 milch cows, 8,000 other cattle, 703 sheep, and 1,657 swine. Capital, Susanville.

**LASSEN, Christian**, a German philologist, born in Bergen, Norway, Oct. 22, 1800. He studied at Christiania, Heidelberg, and Bonn, passed some years in London and Paris, and returned again to Bonn, where he became in 1830 extraordinary and in 1840 ordinary professor. While in Paris he studied the Pali language in connection with Eugène Burnouf, and the result of their joint labors was the *Essai sur le Pali* (1826), published by the Asiatic society. He published with Schlegel the *Ramayana* and the *Hitopadesa*. He was for a time editor of the journal of the German oriental society, and of the *Zeitschrift für die Kunde des Morgenlandes*. His works, which are numerous and valuable, relate to a variety of oriental languages and ancient history, embracing, among other subjects, translations from the Hindoo philosophy, the history of Bactria, Cabool, and India, and cuneiform inscriptions. His principal work is the *Indische Alterthumskunde* (4 vols., 1844-'62; vol. i., 2d ed., 1866), a work of great labor and learning, covering the whole ground of Indian archaeology, mythology, and history.

**LASSO** (Span. *lazo*), a cord in common use in Spanish America for catching wild cattle.

It is a very strong but thin, well plaited rope of raw hide, one end of which is attached to the broad surcingle which fastens together the complicated gear of the *recado* or saddle used in the pampas, and the other terminates in a small ring of iron or brass, by which a noose can be formed. The gaucho, when about to use the lasso, keeps a small coil in his bridle hand, and in the other holds the running noose, which is made very large, generally about 8 ft. in diameter. This he whirls round his head, and by the dexterous movement of his wrist keeps the noose open; then, throwing it, he causes it to fall on any particular spot he chooses. When not in use, the lasso is tied up in a small coil to the after part of the *recado*. The *bolas* is a somewhat similar missile weapon (see **BOLAS**); both have often been used with great effect in war. The chief difficulty in using either lasso or *bolas* is to ride so well as to be able, at full speed, and while suddenly turning about, to whirl it steadily round the head and take aim. On foot any person could soon learn the art. When cattle are caught by the lasso, which is so thrown as to fasten on the horns, they will sometimes gallop round and round in a circle; and if the horse be not well broken, being alarmed at the strain, he will not readily turn like a pivot, in consequence of which men have often been killed; for if the lasso once takes a twist round the rider's body, it will instantly, from the power of the two opposed animals, almost cut him in twain. In Mexico the lasso is called *la reata*; whence the word *lariat* common in the S. W. portion of the United States.

**LASSO, Orlando di**, or **Orlandus Lassus**, a Flemish composer, born in Mons, Hainaut, in 1520, died in Munich, June 14, 1594. He was taken to Italy when a child on account of his fine voice, and until he was grown up was employed as a singer in Milan and Naples. Subsequently he returned to Flanders, settled in Antwerp, and passed the latter part of his life at Munich in the service of the duke of Bavaria. He was a contemporary of Palestrina, and one of the most famous composers of the age, excelling in harmony, and being one of the first to attempt chromatic passages. His secular music, consisting of Latin, Italian, German, and French songs, is better than his compositions for the church, in which he is inferior to Palestrina. A statue has been erected to him in his birthplace. His works were published in Paris in 1576 under the title of *Mélanges d'Orland Lassus*, and in 1584 appeared *Continuation des Mélanges*.

**LASSO CELLS**, the netting organs of aculephs and polyphs, called *cnidæ*. See **ACTINIA**.

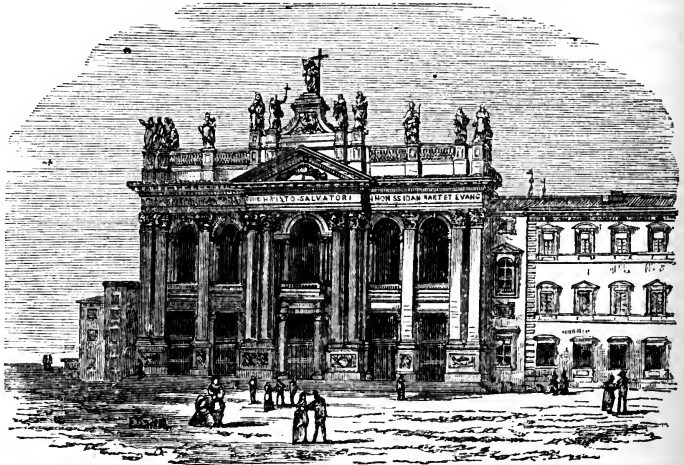
**L'ASSOMPTION**, a S. E. county of Quebec, Canada, bounded S. E. by the St. Lawrence river; area, 248 sq. m.; pop. in 1871, 15,473, of whom 14,979 were of French origin or descent. It is watered by the Marcouche, Achigan, and L'Assomption rivers. Capital, L'Assomption.

**LASTEYRIE, Ferdinand Charles de**, count, a French archaeologist, born in Paris in 1810. He is a son of Count CHARLES PHILIBERT DE LASTEYRIE-DUSAILLANT (1759-1849), author of many works on natural history, industry, and education. He was an aide-de-camp of Lafayette in 1830, and was employed in the civil service till 1842, when he became a deputy; and from May, 1848, to Dec. 2, 1851, he was a member of the constituent and legislative assemblies. His principal work, *Histoire de la peinture sur verre d'après ses monuments en France* (fol., 1837-'58), received an academical prize.—His cousin, the marquis ADRIEN JULES DE LASTEYRIE, born in 1810, is a grandson of Lafayette on his mother's side. He protected the duchess of Orleans on Feb. 24, 1848, when she visited the chamber of deputies of which he was a member. He subsequently sat in the assembly till Dec. 2, 1851. In February, 1871, he was elected to the national assembly as a partisan of Thiers.

**LATAKIA** (anc. *Laodicea*), a town of Syria, 120 m. N. of Beyrout; pop. about 7,000. The town is on a rocky promontory, from 100 to 200 ft. high, which projects nearly two miles into the sea, opposite the N. E. point of the island of Cyprus. The harbor is a deep cove, almost surrounded by rocky banks, at the N. W. angle of the promontory, and has a pier on one side and a projecting tower on the other. The town is surrounded by groves of myrtle, pomegranate, mulberry, orange, lemon, and olive trees, and consists of two portions, the upper and lower town. The former occupies an elevated site at a short distance from the sea, and consists largely of modern houses, but is very dirty; the latter, called La Scala, extends along the shore in the vicinity of the harbor. Latakia and Alexandretta are the ports of Aleppo, and a great part of the important trade of that city with the adjoining provinces passes through the former place. The principal articles of export are tobacco, cotton, gall nuts, sesame seed, wool, wax, camels' hair, and several minor products. In 1871 they were valued at \$1,277,599. Grain can be exported only in times of scarcity in Europe, when the prices compensate for the heavy expenses of transportation, and then chiefly to Marseilles. A portion of the Aleppo wool shipped from Latakia finds its way to the United States. The principal article of trade, however, is tobacco of fine quality, of which large

quantities are raised in the neighborhood. There is also a large trade in sponge. Latakia contains numerous remnants of ancient stone structures, and the surrounding cliffs are filled with rock-cut tombs. (See LAODICEA.)

**LATERAN**, the name of a palace and church in Rome, so called from their being built on the estate of Plautius Lateranus, who was put to death by Nero for complicity in the conspiracy of the Pisos. The palace, whose magnificence is celebrated by Juvenal, having become imperial property, a portion of it was given by the emperor Maximian to his daughter Fausta, the second wife of Constantine. This portion, called *Domus Fausta*, was given by Constantine to Pope Melchisedes in 312, and afterward confirmed to St. Sylvester. It became the residence of the popes till their removal to Avignon (1309); it was burned at that epoch, and rebuilt in 1585. Remaining unoccupied, it was converted into an orphan asylum in 1693, and in 1843 became a deposi-



Church and Palace of the Lateran.

tory for works of art for which no room could be found in the Vatican. To this museum Pius IX. added another for works of Christian art. The only remains preserved of the ancient palace after the fire of 1308 are on the north side of the basilica, under a magnificent portico by Fontana. They are: the private papal chapel built by Leo III., the end wall of the banqueting hall or *triclinium*, and the *santa scala*, or holy staircase. This is behind the *triclinium*, and is said to be the staircase of the house of Pilate, ascended and descended by Christ. The tradition is that it was brought from Jerusalem by Helena, mother of Constantine the Great. It was injured and partly cast down by the earthquake of 896, reërected in the old Lateran palace, left uninjured by the fire, and removed to its present site in 1585. It is composed of 28 marble steps, covered by order of Clement XII. with a ca-

sing of wood, which has been repeatedly worn out by the knees of ascending pilgrims. There is no day on which persons may not be seen creeping up on their knees; but in Holy Week, and particularly on Good Friday, they are covered with the multitude of penitents. At the foot of the stairs are fine sculptures of Giacometti, placed there by Pius IX., and representing the *Ecce Homo* and the "Kiss of Judas." On each side is a parallel flight of stairs by which the pilgrims descend. The *santa scala* leads up to the chapel of Leo III., called the *sancta sanctorum*, in which none but the pope can officiate, which no woman can enter, and which is never open to others except on the morning of Palm Sunday. The altar is in a recess, surmounted by a beautiful silver tabernacle, the gift of Innocent III. In this tabernacle is a famous painting (called *Acheirotopeton*) attributed to St. Luke, placed in the chapel by Stephen III. in 753, and said to be an exact likeness of Christ at the age of 12. Outside of the *santa scala*, to the south, is a tribune erected to receive the mosaics which formerly covered the face of the *triclinium*. The originals, injured by the fire, are in the Vatican; but copies made by order of Benedict XIV. represent the mission of the apostles, Christ delivering the keys to St. Sylvester and the labarum to Constantine, and Peter bestowing on Leo III. the pallium and on Charlemagne a banner.—A basilica, or hall of justice, adjoining the Lateran palace, was, according to some, assigned by Constantine for Christian worship; but according to others, Constantine had a church built there, working at it with his own hands, and it was consecrated Nov. 9, 324, under the title of St. Savior. This church was overthrown by an earthquake in 896, rebuilt by Sergius III. (904-'11), dedicated to St. John the Baptist in 1114, and decorated afterward by Giotto; but it was destroyed by fire in 1308, and rebuilt to be burned down again in 1360. Urban V. restored it in 1364; it was afterward altered, enlarged, mutilated, and embellished under various pontiffs, till it was completely modernized in 1559. As it now exists, this basilica is 408 ft. long, with five aisles of equal elevation, and a flat ceiling profusely and tastelessly decorated by Borromini. The principal front, constructed by Alessandro Galilei in 1734, is considered the finest in Rome. The portico is 33 ft. deep and 174 ft. wide. The central entrance is ornamented with two bronze doors said to have belonged to the ancient temple of Saturn. Above it is the balcony from which the pope gives his solemn benediction on great festivals. To the right of the portico is the *porta santa*, opened only in the year of jubilee; and to the left is a statue of Constantine discovered in the ruins of the *Thermae*. This church has always been considered the cathedral of the bishops of Rome, and the central seat of their jurisdiction; it therefore takes precedence of

all other churches in Rome and the Catholic world. The chapter of St. John Lateran, in like manner, takes precedence over that of St. Peter's. Every pope is crowned there, as in his proper seat. Over the west front is the inscription, *Sacrosancta Lateranensis ecclesia, omnium urbis et orbis ecclesiarum mater et caput*. The wooden table on which St. Peter, according to tradition, celebrated mass in the house of the senator Pudens, is enclosed in the high altar, on which no one but the pope is allowed to celebrate; and there, too, as is believed by Catholics, are enshrined the heads of Sts. Peter and Paul. Five general councils have been held under its roof. Adjoining the basilica during the middle ages were a monastery of canons regular and a celebrated school; the beautiful 12th century cloisters of the monastery are still in-existence. Near them is the baptistery, or church of San Giovanni in Fonte, said to have been erected by Constantine, but more probably by Sixtus III. (432-'40). In front of the basilica is the largest known monolith, an obelisk of red granite covered with hieroglyphs, 150 ft. high with its pedestal, raised in memory of Thothmes IV., brought from Heliopolis to Alexandria by Constantine, and thence to Rome by Constantius.

**LATERAN, Councils of.** Eleven councils of great historical importance have been held in the Lateran basilica, of which the five following are considered by Roman Catholic jurists as œcumenical. I. The ninth œcumenical (or the tenth, if the council of Jerusalem is included in the list) and the first general council held in the West, convened by Calixtus II., who presided over it. It opened March 18, and closed April 5, 1123. There were present 300 archbishops and bishops, and 600 inferior prelates. The chief object of the convocation was to terminate the long quarrel about investitures by promulgating the concordat concluded at Worms between the pope and the emperor Henry V., Sept. 23, 1122. In this it was stipulated: 1, that elections to ecclesiastical dignities in Germany should be held in presence of the emperor or his delegates, without violence or simony, and that the prelate elect should receive by the delivery of the sceptre, the symbol of temporal rule, the investiture of his temporalities; 2, that the emperor renounce all claim to invest with the ring and crosier, the symbols of spiritual jurisdiction; 3, that the emperor grant to all churches within his domains perfect freedom in canonical elections, and pledge himself to protect the Roman see against all enemies. Twenty-two canons were also published against simony, concubinage, and all who coin or circulate counterfeit money. II. The tenth general council, convened by Innocent II., who presided over it. It opened April 20, 1139. About 1,000 prelates were present. It condemned the antipope Anacletus II. and his chief supporter, Roger II. of Sicily, and anathematized the doctrines and adherents of

Arnold of Brescia, of Peter de Bruys, and of the Manichaean heresy. **III.** Convened by Alexander III. to give effect to the peace concluded at Venice between himself and Frederick I. in 1177. Three sessions were held, March 2, 14, and 19, 1179, and 27 canons were enacted. It was decreed that in papal elections a two-thirds vote of all the cardinals assembled should be necessary for a valid choice; that no candidate for the episcopal office could be validly chosen till he had completed his 30th year, and that he must be born in lawful wedlock, and of blameless life and doctrine; that for inferior ecclesiastical dignities the candidate must be 25 years of age, and receive holy orders within a specified time, under pain of forfeiture; that no money or presents should be either asked or accepted for the consecration of prelates, or their installation, for marriage or funeral fees, or for the administration of any sacrament; that in all cathedrals and principal churches masters should be maintained to teach gratuitously, and free schools should be opened in all churches and monasteries where a provision for free education had formerly been made. Tournaments at fairs are forbidden; the "truce of God" must be strictly observed; lepers must be carefully provided for, churches, cemeteries, and priests must be set apart for them, and they shall be exempt from taxation and all other public burdens. The 27th canon anathematizes the Catharists and Waldenses. **IV.** The fourth Lateran council is thought to be the most important ecclesiastical assembly ever held in Christendom. It was convened by Innocent III., opened Nov. 11, 1215, and closed Nov. 30, although sessions were held in January, 1216. Innocent III. presided. There were present 71 archbishops, 412 bishops, 800 abbots, three eastern patriarchs, with the representatives of the others, and the ambassadors of all the Christian sovereigns. In the first session a solemn profession of faith was presented by the pope and accepted. In it the term "transubstantiation" was first used regarding the change in the eucharistic bread and wine. All heresies contrary thereto were anathematized; and it was decreed that all known heretics, after their condemnation by an ecclesiastical tribunal, should be delivered over to the secular arm; all abettors of heresy are excommunicated, and all dignitaries who do not use their endeavors to rid their domains of heretics are threatened with the same penalty. Next come decrees tending to conciliate the eastern churches, and establishing the order of precedence between the great patriarchates. Bishops are enjoined to reform all abuses and scandals among clergy and laity; and they are to choose none but edifying ministers of God. The decrees about free schools in the principal churches are renewed, and to them is added the obligation of maintaining gratuitous courses of instruction in theology and Scripture. New canons prescribe the obligation incumbent on all without ex-

ception of confessing their sins once a year and receiving the eucharist at Easter. Marriage is forbidden between persons related in the first four degrees of consanguinity. The canons regulating ecclesiastical elections are insisted on, the existing religious orders are to be strictly reformed, and no new ones introduced. The last and most earnest measures of the council and the presiding pontiff were taken for the relief of Palestine. It was agreed by the representatives of the Christian powers that the crusading armies should rendezvous at Brindisi and Messina on June 1, 1217. Meanwhile bishops and priests were to preach the crusade unceasingly. The pope bound himself to limit his personal expenses, and to furnish 30,000 livres as his first contribution; the clergy were to give the 20th part of their income for three years, and the cardinals the 10th, under pain of excommunication. **V.** Reckoned as the nineteenth oecumenical council, convened by Julius II. for the purpose of counteracting the influence of the schismatical assemblage called in Pisa in 1511 by a portion of the cardinals acting under the orders of the emperor Maximilian and of Louis XII. of France. The council was opened May 3, 1512, by Julius in person. There were present in the first session 15 cardinals, the patriarchs of Alexandria and Antioch, 10 archbishops and 56 Italian bishops, a large number of inferior prelates, and the ambassadors of Spain, Venice, and Florence. Later the other sovereigns sent their representatives, and permitted their subject bishops to attend the council. On May 17 articles of confederation between the pope and the king of England were read. In the session of Dec. 3 France was laid under an interdict. The pope, whose health was failing, promulgated a decree about papal elections, excluding the council from all participation therein, and invalidating every choice made by the cardinals under the influence of simony, even when followed by coronation and recognition by the states of Christendom. Leo X. presided over the last sessions of the council, in which the schismatic cardinals were reconciled to the church, and a bull was read Dec. 19, 1516, condemning the pragmatic sanction of Charles VII. of France, and substituting therefor a concordat concluded with Francis I. The council was closed March 16, 1517.—The dates and principal acts of the Lateran councils not considered general were as follows: 1. Convened Oct. 5, 649, concluded Oct. 31, under Martin I. There were 500 bishops present. The Monothelite heresy, the *Ecthesis* of Sergius of Constantinople (639), and the *Typus* of the emperor Constans II. (648), were condemned. 2. Convened Dec. 23, 864, by Nicholas I., and concluded in January, 865. It condemned Rodoald, bishop of Porto, and Zachary, bishop of Anagni, papal legates in Constantinople, for supporting the intrusion of Photius in 861. 3, 4, and 5, in 1105, 1111, and 1112, respectively, were con-

vened by Paschal II. during his quarrel about investitures with the emperor Henry V. 6. Convened in March, 1167, by Alexander III., to excommunicate and depose the emperor Frederick I. Two other convocations, reckoned as councils by some authors, were held in the Lateran respectively in 900, to annul the sentence of deposition on Aargrine, bishop of Langres, and in 993, to celebrate the first known solemn canonization, that of St. Udalric, bishop of Augsburg.

**LATHAM, John**, an English ornithologist, born at Eltham, Kent, June 27, 1740, died in Romney, Feb. 4, 1837. In 1763 he commenced the practice of physic in Dartford. He early applied himself to the study of natural history, and aided Sir A. Lever in forming his museum. He became a fellow of the royal society in 1775, and was one of the founders of the Linnæan society. In 1796 he retired from practice. He is the author of a "General Synopsis of Birds" (6 vols., 1781-75; 2 vols. additional, 1787-1801), and an *Index Ornithologicus* (1791). A new edition of his works in 10 vols. 4to, enlarged and rearranged, with a general index, under the title of "General History of Birds," was commenced in 1821, and completed in 1824. The plates of this, as of his former works, were executed or retouched by himself. He also wrote papers on medical science and natural history.

**LATHAM, Robert Gordon**, an English philologist and ethnologist, born at Billingborough, Lincolnshire, in 1812. He was educated at Cambridge, and subsequently took the degree of M. D. He then travelled in northern Europe, and while in Norway studied the idioms of the Scandinavian tongues. Upon his return to England he published a translation of Bishop Tegnér's poem, "Alexis and Frithiof" (1839); "Norway and the Norwegians" (2 vols., 1840); an "Abstract of Rask's Essay on the Sibilants;" and an "Address to the Authors of England and America," the object of which was to effect a modification of the existing alphabet. In 1840 he was appointed professor of English literature in University college, London, and while so engaged he published a series of works on the English language. The chief among these was his "Treatise on the English Language" (2 vols., 1841), of which a number of editions have appeared. He next gave his attention to ethnology, and published "Natural History of the Varieties of Mankind" (1850), and "Man and his Migrations" (1851). He has also published "Ethnology of the British Colonies" (1851), "Ethnology of Europe," "Ethnology of the British Islands," "Descriptive Ethnology" (2 vols., 1859), "Nationalities of Europe" (1863), and several other works. In 1853 he commenced a new edition of Johnson's dictionary, the last number of which was published in 1870. He has produced an edition of the *Germania* of Tacitus, with notes historical and philological (1850), and has read many important papers before the British association for the advancement of science. As a

physician he has held a high position, and lectured on medical jurisprudence at the school of the Middlesex hospital.

**LATHBURY, Thomas**, an English clergyman, born in 1798, died Feb. 11, 1865. He was educated at Oxford, and became incumbent of the parish of Sts. Simon and Jude, Bristol, in 1848. He wrote a "History of English Episcopacy" (1836), "State of Popery and Jesuitism in England" (1838), "History of the Spanish Armada" (1840), "History of the Convocation of the Church of England" (1853), and "History of the Book of Common Prayer" (1858).

**LATHROP, John Hiram**, an American educator, born at Sherburne, Chenango co., N. Y., Jan. 22, 1799, died at Columbia, Mo., Aug. 2, 1866. He graduated at Yale college in 1819, and was tutor at that institution from 1822 to 1826, when he was admitted to the bar and commenced practice at Middletown. But education was his chosen field, and after teaching at Norwich, Vt., and Kennebec, Me., he became in 1829 professor of mathematics and natural philosophy in Hamilton college, Clinton, N. Y., and in 1835 of law, history, church polity, and political economy. In 1840 he became president of Missouri state university, in 1849 first chancellor of Wisconsin university, and in 1859 president of Indiana state university, which post he resigned in 1860 and returned to Missouri university as professor of English literature. He was reelected president in 1865, and held that office till his death. His published addresses elaborately discuss questions connected with advanced education.

**LATHROP, Joseph**, an American clergyman, born in Norwich, Conn., Oct. 20, 1731, died in West Springfield, Mass., Dec. 31, 1820. He graduated at Yale college in 1754, and taught school at Springfield, Mass., at the same time studying theology under the direction of the Rev. Robert Breck. In August, 1756, he was ordained pastor of the Congregational church in West Springfield, where he preached regularly till 1818. He received the degree of D. D. from Yale college in 1791 and from Harvard university in 1811. In 1792 he was elected a fellow of the American academy of arts and sciences. He was often called upon to settle ecclesiastical difficulties. His publications consist mainly of discourses which he had delivered from the pulpit (7 vols., with an autobiography, 1796-1801).

**LATIMER, Hugh**, an English bishop and reformer, born at Thurcaston, Leicestershire, about 1490, burned at the stake in Oxford, Oct. 16, 1555. The son of a farmer, he was sent to the university of Cambridge when about 14 years of age, was chosen a fellow of Clare Hall in 1509, and received the degree of M. A. in 1514. He then began the study of divinity, and obtained the baccalaureate of theology by a sharp disputation against the doctrine of Melancthon, but became a Protestant about 1520, chiefly through the influence of Bilney. In 1527 he delivered a sermon in presence of the



bishop of Ely and numerous priests, in which he drew a contrast between Christ as the exemplar and the English prelates of the day. For this he was forbidden by the bishop to preach in the churches of Cambridge university, but being summoned before Wolsey was dismissed with merely a gentle admonition, and was licensed to preach in any church throughout England. In 1529 he preached two sermons at Christmas "On the Card;" making the practice of card-playing at that festival an occasion, after the taste of the time, to deal out Christian cards, "hearts" to be "trumps." In these sermons he defended the doctrines of the reformation, inveighed against indulgences, and showed the uncertainty of tradition and the need of the Bible in the language of the people. The disturbance which this occasioned was settled, after investigation before the vice chancellor, by binding both him and his opponents to abstain from offensive expressions against each other in the pulpit. In the following year he favored the divorce of Henry VIII. from Catharine, and was appointed one of the royal chaplains, but remonstrated against the king's inhibition of all English books containing any matters of Scripture. Appointed to the living of West Kington, Wiltshire, he travelled extensively, everywhere occasioning excitement and complaints by his sermons. In 1532 he was prosecuted before the bishop of London, the archbishop of Canterbury, and the convocation, and was at first excommunicated, but was ultimately relieved of all penalties on condition of signing a portion of the articles proposed to him. On the elevation of Cranmer to the primacy in 1533, Latimer was recalled to his royal chaplaincy, and preached before the king on all the Wednesdays of Lent in 1534. He was consecrated bishop of Worcester in 1535, and in 1536 opened the convocation with two of his boldest sermons. Devoting himself with great diligence to his special episcopal duties, he did not again appear prominently till in 1539 he resigned his see on the passage of the six articles making it penal to impugn transubstantiation, communion in one kind, celibacy, the lawfulness of monastic vows, private masses, and auricular confession. He lived in great privacy till an illness required him to seek medical aid in London, where he was discovered by Gardiner's spies, and was imprisoned from 1541 to 1547. After the accession of Edward VI. he declined, probably on account of ill health, to receive back his bishopric, which was offered him at the instance of the house of commons. He took little part in the public direction of the reformation; but, as the popular favorite, he did more than any other man to prepare the way for it in the hearts of the people. After the accession of Mary he was apprised of his danger, and time was allowed him for escape; but he refused to avail himself of the opportunity, and was committed to harsh confinement in the tower. In 1554 he was conveyed to Oxford with Cran-

mer and Ridley, to hold a disputation on the subject of the mass with several doctors from the universities. He pleaded that he was old, sick, and had used the Latin tongue but little for 20 years; he was therefore permitted to give in a long profession of faith in writing, for which he was condemned as a heretic, and imprisoned during more than a year in Bocardo, the common jail of Oxford. He was then summoned again before the commissioners, but refusing to recant, was condemned to the stake. The sentence was executed on him and Ridley "without Bocardo gate," opposite Balliol college, where the martyrs' monument now stands. He was led to the stake with Ridley, gunpowder being fastened about his body to hasten his death; it took fire with the first flame, and he died immediately. He exhorted his fellow sufferer: "Be of good comfort, Master Ridley, and play the man; we shall this day light such a candle, by God's grace, in England, as I trust shall never be put out." Latimer was rather remarkable for piety and eloquence than for learning and ability. The latest edition of his sermons, by the Rev. G. E. Corrie, was published in London in 1845, in 4 vols. 8vo. His biography has been written by the Rev. R. Demaus (London, 1869).

**LATIN LANGUAGE AND LITERATURE.** The Latin language is a branch of the Aryan or Indo-European family, and was spoken by the Latins, or inhabitants of Latium, in central Italy, probably as early as 10 or 15 centuries before our era. It became afterward the language of the Roman republic and empire, and was spoken over the entire Italian peninsula; and, with some inevitable corruption, it was so universally adopted in Africa, Spain, Gaul, Britain, and Pannonia that, as Gibbon remarks, "the faint traces of the Punic or Celtic idioms were preserved only in the mountains or among the peasants." It ceased to be a living tongue about the 8th century of our era, when it had given birth to the Romance idioms; but it continued in use as the language of the church, of law, and of learning generally, until within the last two centuries. Even at the present time many scientific works, especially on law and philology, are written in it. The Pelasgians exercised upon the earliest civilization of Latium an influence similar to that which they had on Greece. (See GREECE, LANGUAGE AND LITERATURE OF.) The Tyrrhenian and Arcadian Pelasgians, and the Epirotic Græci or Graii, the general term by which the Romans designated all the Greeks, may all be included under the name of Latini, whose prehistoric age is designated by the terms *aborigines* or *casei*. The best evidence for the early existence of Pelasgians in Italy is the Latin language itself, which evinces a closer relationship to Greek than to any other known tongue. The Latins themselves had no definite tradition of it, though some ancient authors attempt to establish a derivation of Latin from the Æolic dialect of Greek. Latin con-

tains also a very considerable number of foreign words and forms which cannot be resolved into Greek elements. Niebuhr was probably the first who succeeded in separating the Greek from the non-Greek elements. Lange, Lassen, Müller, Döderlein, Mommsen, Aufrecht, Kirchoff, Corssen, and G. Curtius have made these differences clearer. Like the Hellenes, the Latins remodelled the linguistic material imported by the Pelasgians, according to their own needs and under the influence of the languages spoken in the surrounding districts of Italy. (See ITALIC RACES AND LANGUAGES.) During the first 500 years of the existence of Rome, Latin was thus developed into a peculiar idiom without experiencing the guidance of a native literature; there is therefore nothing whereby the internal history of the formation of the Latin language can be traced. Dated inscriptions of high antiquity are also exceedingly rare; the oldest are those of Scipio Barbatus at Luceria, or of the second half of the 5th century of the city. During the long period of nearly eight centuries, from about 250 B. C. to A. D. 500, while Latin was a living tongue and had a literature, it experienced comparatively few grammatical changes. Some archaic endings of nouns and verbs in declension and conjugation were eliminated during the classic period, but otherwise the grammar maintained great stability. The vocabulary, however, was constantly enriched. Some writers took great pleasure in forming new words, many of which met with general adoption and came to be used in place of other words, which gradually disappeared. Latin was in its highest perfection in the 1st century B. C., and afterward deteriorated. Disputations were then made about the classicism or Latinity (*latinitas*) of words and phrases. *Latinitas* was probably the colloquial language of the higher classes, in distinction from the archaisms and mutilations of the uncultured. A people which owed its entire literary culture to foreign lands, and which constantly came in contact with foreign nations, necessarily adopted a multitude of foreign words into its vocabulary. With the beginnings of a literature came also an influx of Greek expressions, not only for objects of art and science, as *theatrum*, *tragedia*, *philosophia*, *grammaticus*, but also for common household utensils, as *amphora*, *abacus*, and *aulæum*. By taking up a dictionary and looking over the words beginning with *chamæ*, *chrys*, *cy*, *dia*, *ep*, *eu*, *h* (especially *hy*), *leuc*, *meso*, *mono*, *my*, *nyct*, *orth*, *oxy*, *pseudo*, *sym*, *syn*, *th*, *z*, and *z*, one may easily gain an idea of the vast number of Greek words which the Latin language contains. Hebrew, Syriac, Punic, Persian, and Parthian words were also incorporated, but not as largely as Celtic expressions acquired with the conquest of Gallic lands. Germanic terms also make their appearance during the time of the empire; a few, as *ballux*, a grain of gold, *gurdus*, stupid, and *lavrez*, a rabbit, are said to be of Spanish (probably

of Iberian) origin; and *mastruca*, fur, according to Quintilian, is a Sardinian word. Nevertheless, excepting what Latin has borrowed from Greek, it contains remarkably little of foreign origin; and in spite of the constant intercourse with foreign lands and nations, it always retained its own original structure and composition.—The history of the Latin alphabet, so important on account of its remaining in use in several of the most cultured languages of Europe, has not been completely and accurately retraced. The chief cause of this failure is the lack of written monuments of a date earlier than the 3d century B. C. Cicero and Quintilian say that the Latin alphabet was originally composed of 21 letters, and ended with the letter X; but the earliest monuments exhibit only 20 different characters. Mommsen, F. Lenormant, and other great palæographical scholars are of opinion that the letter which disappeared was Z. The argument is, that the Latin alphabet was formed after the model of the Greek, and that the letter G, subsequently introduced, was put between F and H because the disappearance of the Z had left a gap there. Mommsen considers the character  $\text{Z}$  in the inscription of Milonia to be a Z. It is supposed that the Greek alphabet reached Rome by way of Sicily or from Cumæ. Kirchoff, in *Abhandlungen der Akademie der Wissenschaften zu Berlin* (1863), was the first to perceive that the Æolo-Doric variety of the Greek alphabet, employed in the Chalcidian colonies, was the parent of the Latin characters. The first and second columns of the following illustration seem to establish the opinion. The first notable change in the composition of the alphabet was the reduction of the sibilants S and Z to the single letter S, and of the gutturals C and K to C only. It is evident, however, that C and K did not at first represent the same sound. As in Greek, C was originally a G. It was customary to write K before *a*, instead of C, which stood before the other vowels; thus, *Karthago*, *merkatus*, for the definite orthography *Carthago*, *mercatus*. Otfried Müller suggests that it is due to Etruscan influence that in course of time all gutturals were pronounced hard, which deprived the C of the G sound, and rendered it homophonous with K. Thereafter C rapidly supplanted K, and was generally written for every guttural sound except Q. The need of a G sound soon became apparent again, but as the form C had lately acquired the power of K, another letter was fashioned by a slight appendix to the character C, forming G. The letters Y and Z came late into use to supply articulations of Hellenic words which the Latin alphabet could not indicate. They were not generally employed before the time of Cicero, when they were made to follow the original series of Latin letters.—The pronunciation of Latin, as now taught, is not uniform. Scholars in different countries generally pronounce it substantially as they do their own languages. In the United States, however,

Α Α	Α Α	Α Α	Α
Β Β	Β Β	Β	Β
< C	< C	C	C
▷ D	D	D	D
E	E E	E II	E
F	F F	F I'	F
I	Ɔ	G	G
H	H	H	H
I	I	I	I
K	K	K	K
Λ	Λ	Λ L	L
Μ Μ	Μ Μ	Μ Μ	Μ
N	N	N N	N
◊ O	◊ O	O	O
Γ	Γ P	P P	P
Q	Q	Q	Q
R R	R R	R	R
⚡ S	⚡ S	S	S
T	T	T	T
V	V	V	V
X	X	X	X
⊙			Y
↓			Z

Ancient Latin Alphabets.

two distinct systems are recognized, generally known as the English and the continental methods, using respectively the English and the Italian sounds of the vowels. Neither of these methods renders Latin as the Romans spoke it, the consonants being chiefly mispronounced in either; and though it is now pretty well ascertained what the Roman pronunciation was, yet a change in the common pronunciation of Latin has been found too inconvenient. But it is expected that the difficulties will soon be overcome, and the correct pronunciation be generally adopted. Henry John Roby, in his "Grammar of the Latin Language from Plautus to Suetonius" (2d ed., London, 1872), has an admirable exposition of the sub-

ject. We give a summary statement of the probable pronunciation of educated Romans in the period from Cicero to Quintilian, about 70 B. C. to A. D. 90. The long and short sounds of a vowel, always different in English, were probably identical in quality in Latin: *ā* as in father, *â* as in French *chatte*, not as in *hat*; *ō* nearly as in *dot*; *ō* nearer to English *aw* than the ordinary *o* in *dote*; *ū* like French *ou* in *poule*, nearly as in *pull*, not as in *lull*; *ū* like *oo* in *pool*; *ē* nearly as in *pet*; *ē* the same sound lengthened; *ī* as in *machine*; *ī* the same sound shortened; *y* like German *ü*, but inclining to *i*, somewhat as in *Müller*. The rule for diphthongs is to pronounce the constituent vowels as rapidly as possible in their proper order; thus, *au* as in German *Haus*, and broader than *ow* in *cow*; *eu* as in Italian *Europa*; *æ* as *a* in *bat* lengthened; *æ* as a diphthong; *ei* nearly as in *feint*; *ui* like French *oui*. The diphthongs *ou* and *oi* are found only in early Latin. Of consonants, *c* is always hard, like *k*; *g* always hard as in *give*; *nc* and *ng* like *ngc* and *ngg*, as in *anchor* and *anger*; *j* like *y* in *year*; *v* like *w* in *wine*; *r* always trilled; *s* always sharp as in *hiss*; *bs* like *ps*; *x* like *ks*; *t* always like *tea*; *ph*, *ch*, *th* not like the English *f*, German *ch*, and English *th*, but like *p'h*, *k'h*, *t'h*, the sounds being separately enunciated, or the *p*, *c*, and *t* aspirated, as often heard from Irishmen; and *m* was sometimes not sounded, or perhaps gave only a nasal sound to the vowel. The Romans distinguished between an acute and a circumflex accent. The latter rested only on monosyllables which have long vowels, and in words of more than one syllable on the penultimate, if that contained a long vowel and the final syllable a sharp vowel. Monosyllables always have the accent; dissyllables have the accent on the penultimate, unless they are enclitic; words of more than two syllables have the accent on the antepenult if the penult is short, and on the penult if it is long. Besides accent, the quantity of syllables was distinguished. If the voice dwells upon a syllable, that syllable is called long; if the voice passes rapidly over it, it is called short. Two short syllables are considered to occupy the same time as a long one. A syllable is long or short, either because it contains a vowel naturally long or short, or on account of the position of its vowel. (See W. Corssen, *Ueber Aussprache, Vokalismus und Betonung der lateinischen Sprache*, 2d improved ed., 2 vols., Leipzig, 1868-'70).—In Latin, nouns, pronouns, adjectives, verbs, and some numerals, are inflected; other words are not. The inflexions of nouns, pronouns, and adjectives are in the main the same; those of verbs are quite distinct. The difference between substantives and adjectives is now held to be almost entirely syntactical, and even as such not very great. Inflexions of nouns are always additions to or alterations in the ending of the stem or root of the word. The inflexions for tense, mood, person, number, and voice in verbs are at-

tached to the stem. Sex is attributed to many things which do not really have it; but gender, which is masculine, feminine, or neuter, is never assigned arbitrarily in defiance of the true sex, if of importance. Only singular and plural numbers are distinguished. Distinctions of case are in the singular five, the cases being named nominative, accusative, genitive, dative, ablative; but in some nouns and adjectives of the masculine gender a sixth form, not properly a case in the opinion of many scholars, is found, called the vocative. In the plural there are only four: nominative, accusative, genitive, and a common form for the dative and ablative. Originally perhaps there was a different form for each case in each number. The suffixes for the different cases are usually combined with the final vowel of the stem, so as not always to be readily distinguishable. Declensions are not always regular, and many old and exceptional forms of cases occur. Greek nouns in the pre-Augustan period generally received slight changes, especially of vowels, to adjust them to the Latin usage. Adverbs, prepositions, and conjunctions are indeclinable words; some of them are cases of existing, others of lost words; others again are words with case suffixes different from those in common use in Latin; and still others are mutilated remnants of fuller expressions. In verbs there are two voices, the active and the passive, the latter sometimes called reflexive or middle. Some verbs have both voices, and some have only the active, except in the third person. Others, called deponents, have only the passive, but with the signification apparently of the active. In a few verbs no plural is found. There are three moods, indicative, subjunctive or conjunctive, and imperative; six tenses in the indicative, viz.: three denoting incomplete action, present, future, and imperfect (also called present imperfect, future imperfect, and past imperfect); and three denoting completed action, perfect, pluperfect, and completed future (sometimes called present perfect, past perfect, and future perfect). In the subjunctive there are only four distinct tense forms, present, imperfect, perfect, and pluperfect. Some verbs in the active and all in the passive have only three simple tense forms in the indicative, those of incomplete action, and in the subjunctive only the present and imperfect. The passive voice supplies tense deficiencies by participles in combination with certain tenses of the verb *esse*, to be. Two indeclinable substantives, called infinitives, are usually treated in connection with the verb; also three verbal adjectives, called participles, the present and future, belonging to the active, and the past, to the passive voice; a verbal substantive and adjective, called the gerund and the gerundive, the former usually with the active, the latter with the passive voice; and two supines, which are the accusative and ablative or dative of a verbal noun. Every single word

in the Latin verb is a complete sentence; the verbal stem being used, not by itself, but in combination with abbreviated forms of pronouns of the first, second, and third persons. The principles on which all verbs are inflected are the same. The differences in detail are due, some to the nature or ending of the stem of the particular verb, some to the unequal preservation of parts of an originally fuller system of inflections. The forms of the present indicative singular active are the simplest, and arise from the union of the stem with personal pronouns. All other parts of the verb contain modifications for tense, mood, number, and voice; those for tense and mood are made between the stem and the personal pronoun, and the inflections for number and voice appended after them. Thus *rêg-êr-ê-m-us* is the first person plural active imperfect subjunctive of a verbal stem meaning "rule." *Rêg* is the stem, *êr* denotes past time, *ê* the mood, *m* the speaker, *us* the action of others with the speaker; and if *-us* be changed into *-ur*, the speaker and others are passive instead of active.—The study of Latin and its monuments, after the beginning of the Gothic age, or about A. D. 500, when it had ceased to be spoken by a distinct people, was at first greatly neglected. When the Germanic races settled in the Romance countries, Latin was spoken only by the clergy and retreated to the convents, where also the remains of the libraries were carried. The monks, however, had little taste for ancient Latin literature; the manuscripts were not copied by them, and they even allowed them to perish, or to be injured by neglect. In the 6th century only Boëthius and Cassiodorus still made a literary use of Latin, and only a few amateurs busied themselves with corrections and revisions of manuscripts, especially of Horace and Virgil. Several elementary text books of Latin grammar were compiled, but the most valuable literary effort of this period is Priscian's summary of Latin philology, which remained the chief authority of the middle ages, and even down to modern times. But men were not wanting, like Fulgentius Planciades, who in their ambition to be considered erudite invented high-sounding phrases, and gave them out as citations from ancient authors. The poetry of this age, by Arator, Venantius, and Corippus, and also the prose of Ennodius, has no other value than as it testified that taste, learning, and skill were rapidly declining. Happily the Benedictine order of monks, which began to flourish during this period, favored the copying of good books, and was thus a means of preserving the ancient authors. The dominion and wars of foreigners, and the settlement of Greeks and Lombards in Italy, and of Franks in Gaul, grew more and more disastrous to the Latin language and literature. Writing materials becoming scarce, ancient works were erased from parchments, which were then used for the purposes of the church. Ignorance of Latin literature gradually produced

a prejudice against it. Monks in Ireland were then the means of preserving the monuments of the literature of Rome, and the converted Anglo-Saxons of England became diligent students of Latin, and translated and copied many manuscripts. During the 7th and 8th centuries lived the eminent scholars Aldhelm of Malmesbury and the Venerable Bede, and after them Winfrid and Alcuin, who labored for Latin culture in France. Charlemagne established schools in which Latin was studied, encouraged the copying of ancient manuscripts by paying largely for them, and founded a library. But though some of the wealthy laity studied Latin for a while, the knowledge of it was soon after that emperor's death again restricted to the clergy. Walafrid Strabus, Servatus Lupus, Scotus Erigena, Hincmar, and Rabanus Maurus were the most eminent ecclesiastical writers of this time. The end of the 9th century also was propitious for Latin. King Alfred, the founder of Oxford university, contributed greatly to the preservation and translation of ancient manuscripts, and caused collections of them to be made. The Normans hindered the development of Latin studies in England, but Germany under the Othos and their successors continued the labors of the British isles. As under Charlemagne and Alfred, several ladies distinguished themselves as careful and accurate copyists of Latin texts; and the nun Roswitha produced several surprisingly excellent poems. Historiography was better represented by Wittekind and Ditmar, and the Lombard Luitprand, and in the middle of the 11th century by Adam of Bremen and Lambert of Asechaffenburg. The convents of Fulda, St. Gall, Reichenau, Hirschau, Paderborn, and Hildesheim were now the chief seats of Latin learning, and Bruder, Bruno, and Gerbert distinguished themselves by their extensive studies and great erudition. Text books and dictionaries, however, were the exclusive property of Italy. The Carthusian and Cistercian monks were very useful during the 12th century, and many highly esteemed codices are written in their hand. Several schools of learning were established in Germany during this period, which, combined with the labors of newly founded orders of monks, as the Dominicans and Franciscans, were also instrumental in preventing the total decay of Latin learning; but the latter were the means of misguiding the taste of German scholars with their so-called monks' Latin. Many a scholastic philosopher was well read in ancient authors. In France there was Abélard, in England John of Salisbury, and in Denmark Saxo Grammaticus, whose Latin is not to be despised. But with the middle of the 13th century came a period of gross ignorance, and Roger Bacon seems to have been the only one who had a really intimate acquaintance with the classics. Italy thus came about this time to occupy the highest place in Latin studies. Milan had already attained some distinction,

and it was now the centre of true philology. Petrarch's admiration for Cicero and Virgil inspired also the better classes of his countrymen, who were suddenly seized with an ardent desire to become acquainted with the literature of Rome. The Latin manuscripts had long remained unread in the monasteries; many of them had been destroyed, and others were mislaid and forgotten. Petrarch, Boccaccio, and Poggio Bracciolini undertook to collect them, and many manuscripts were carried by them from the German convents to Italy, where they were rapidly multiplied, and formed the basis of the Vatican library. Wealthy Italians imitated their example, a great bibliographical activity set in, flourishing factories produced multitudes of copies, and the learned were soon enabled to complete and correct defective texts by careful comparison of manuscripts. These labors of the 14th and the first half of the 15th century were carried on in a somewhat dilettante spirit; but after the year 1465, when the first printing houses were established in Italy and the lovers of learning had the means of communicating to each other the results of their researches, critical discipline soon laid the foundation for a special science. The long line of critics to whom the *editiones principes* are mainly due number, among other eminent scholars, the bishop Andreas Aleriensis, Antonius Campanus, and Leoniceus Omnibonus, the able counsellor of Nicholas Janson, the great master of the typographic art. Criticism was finally carried so far as to lead to very bold interpolations; interpretation, being at this time a new science, gave birth to many exceedingly peculiar explanations; and emendations of texts introduced in some places a wonderfully motley Latin. But in spite of all these drawbacks, men like Hermolaus Barbarus, Calderinus, Britannicus, Marsus, Beroaldus I., Baptista Pius, and Budæus, the first philologist of France, did much valuable work in the furtherance of Latin studies. The enthusiasm of the Italians for the culture of antiquity was completely chilled before the end of the 16th century. The Roman Catholic church put a check on classical studies. The culture of that age was worldly and unwholesome, and a reaction was needed equally for the clergy and the laity. About the beginning of the 16th century France and Germany had cultivated the Latin authors on their own soil. Doletus, Turnebus, Morel, and the Stephenses produced typographically and linguistically excellent editions of texts. With Dorat and Lambin at their head, the French raised the methods of interpretation to a scientific standing, and men like Peiresc largely increased the treasure of ancient manuscripts by searches in private and public libraries, and heightened their value by learned emendations and corrections. The most eminent philologist of this period was Scaliger, to whose critical insight and comprehensive knowledge of the whole field of Latin literature are due many restora-



tions of corrupted texts. He found a worthy collaborator in Casaubon, whose translations and editions are executed with masterly scholarship and care. During the 17th century the number of truly learned philologists decreased in France. Petavius was one of the most eminent. Diplomacy abandoned the use of Latin and substituted French. The practical and fashionable interest being thus on the wane, even scholars acquired little more than a sort of amateur mastery of Latin classics. This is rendered evident especially by the unskilful manner in which the Delphin edition of Latin classics was continued after the death of Huet, its originator. Germany was not as forward in Latin philology as France during the 15th, 16th, and 17th centuries. The first endeavors were tainted too much with the spirit of scholasticism to be of lasting value. Dalberg, Pirkheimer, and Peutingger labored to diffuse the knowledge of Latin, and caused the publication of several texts. But a more permanent influence was exercised by Hegius, Wimpeling, Bebel, and Locher, whose chief attention was directed to grammatical and rhetorical instruction. Reuchlin's labors were the most effective. He brought Latin plays of his own composition, represented by students of Heidelberg, before German audiences, besides translating several Greek authors into Latin. He was instrumental also in drawing popular interest to classical studies through the disputations which were carried on against him by the clergy on account of his leaning toward Roman antiquities. Hutten and Von dem Busche, who were also in the midst of these discussions, were instrumental in promoting classical tastes. The first grammars and other elementary works printed in Germany were not equal, either in learning or in typographical execution, to similar works issued from the Italian press, and it was difficult to find pupils who cared to learn the classic Latin instead of that of the scholastic institutions. The works of the fathers of the church, and several books on history, received more care on the part of the editors and printers. Melanchthon was of great importance as a Latin grammarian and teacher. He was at the head of the Philippici, which school numbered Neander, Fabricius, and Wolf as disciples. The thirty years' war uprooted the seed so carefully sown. The old Latin barbarisms sprang up again, and hardly before the middle of the 18th century were serious attempts made at arresting the progress of the decay of the Latin language as it appeared in print and was uttered in chairs and chancels. The Netherlands in the mean time afforded the safest asylum for Latin studies. While in other countries a certain dilettantism was observable in many productions of the 15th, 16th, and 17th centuries, Holland introduced a method into Latin philology, and gave it a scientific basis on which it continued till modern times. Erasmus wrote excellent Latin, without falling

into the mannerism of the Ciceronians. In the latter half of the 16th century the labors of Justus Lipsius, and the influence exercised by the newly founded university of Leyden, were aided by the excellent work of great typographers. Scaliger also went to Holland, and he and Grotius, Vossius, the family Heinsius, and Gronovius succeeded in laying before the world the best editions which had appeared. Grævius, Burmann, Perizonius, Drakenborch, Oudendorp, and Ducker, whose researches reach to the latter half of the 18th century, were the master critics of their age, and gave their country the foremost position in Latin philology. England produced a man who extricated the Latin studies from the errors of treatment into which the scholars of other countries had fallen. Richard Bentley was the father of the science of verbal criticism. His Horace was a masterpiece of erudition and critical penetration; it laid down a method of philological treatment not thought of before. Markland's skeptical and plodding criticism followed the same vein. Germany soon recovered from the consequences of the reformation and the thirty years' war, and combining the best of the efforts of England and Holland, she stood in the middle of the 18th century on a level with them. Ernesti put a check to the tendency toward hiding the value of the authors commented upon behind accumulations of trifling learning and personal opinions. Heyne searched for the sources of texts and various readings, and was also the means of clearing away much rubbish. His edition of Virgil was deservedly a model of philological work for the next decades. Then came F. A. Wolf, whose aesthetic spirit and delicate penetration laid the foundation for a more elevated treatment of the Latin authors. At the end of the last century there was almost a jealous competition among scholars in publishing so-called critical editions, and a large quantity of previously unused material was put into circulation. The critical apparatus of ancient manuscripts and early editions thus became more trustworthy and complete. The traditional errors began to disappear, and Madvig's Cicero and Lachmann's editions of several poets were excellent attempts at reaching authentic texts. The labors of the present century have resulted in an almost total reconstruction of the works of the most favorite Latin authors. The rise of historical and juristic studies, with Niebuhr in the van, furthered the elucidation of many obscure and neglected passages, greatly facilitating the understanding of ancient Latin works. The Germans now hold indisputably the foremost place in Latin studies, and their labors form the basis of most of the books on Latin published in other countries. The most eminent German scholars, with the special fields in which their works are now the chief authorities, are: on the relation which Latin holds to Greek, Ross; on the history of the Latin language while a living

tongue, Hefster; on grammar, Schneider, G. F. Grotefend, Zumpt, Ramshorn, Otto Schulz, Reuscher, F. A. Grotefend, G. T. A. Krüger, Reising, Mühlmann, Anthon Schmidt, Kritz, Berger, Engelmann, and Fr. Bauer; on the older Latin, to the end of the republic, Ritsch, Corssen, Bücheler, and Lübbeck; on pronunciation, Kopp, Geppert, and Corssen; on vowels, Dietrich and Fröhde; on accent, Langen, Weil, and Benlōw; on the history of the alphabet, Ritschl; on orthography, Ritsch, Mommsen, Fleckeisen, and Brambach; on diminutives, Gustav Müller; on proper names, Mommsen; on composition, Uhdolph; on declension, Bücheler; on pronouns, Osann and Särgert; on conjugations, Nölting, Curtius, Pauli, Lübbert, Weissenborn, Lange, and Sander; on prepositions, Schwarz; on conjunctions, Wisowa; on syntax, G. T. A. Krüger, Hermann Schmidt, K. O. Müller, Holtze, and Scheuerlein. General lexicons have been compiled by Freund, Georges, Mühlmann, and Klotz; etymological lexicons by Schwenck and Georges; special lexicons—for the poets by Bach, Stern, and Lorey, for the sources of jurisprudence by Merkel, for the historians by Dräger, and for Tacitus by Dräger, Zernial, and Bötticher. The *lingua rustica* or vulgar Latin, specially or in its relation to the Romance tongues, has been treated by Schweitzer, Berblinger, and Böhmmer; its vocalism by Schuchard; the Latin of the middle ages by Diefenbach, Brinckmeier, and Hildebrand. Recent English writers on Latin grammar and lexicography, including elementary school books, are Ainsworth, Church, Donaldson, J. C. Evans, T. H. Edwards, T. W. C. Edwards, Fowle, Frost, Gepp, Haigh, Hayman, Hooper, Howard, Kemp, Key, Kirk, Kavanagh, Kennedy, Leary, Lowe, Macgowan, Mason, Millington, Melvin, Mayor, Newman, Oxenham, Perkins, Potts, Riddle, Robertson, Robson, Roly, Rust, Roberts, Stapylton, W. Smith, R. P. Smith, Sargent, Stretton, T. W. Thompson, J. T. White, and Wilkins.—

LITERATURE. The history of Latin literature may be divided into several well defined periods. The earliest period, until the appearance of the poems of Livius Andronicus, about 240 B. C., is void of monuments of literature proper, and may be designated as the period of the beginnings of Latin literature. The second period reaches to the death of the emperor Augustus (A. D. 14). This period may be subdivided into the age of archaisms, or of natural or artless productions; the Ciceronian age, or that of artistic prose; and the Augustan age, or that of artistic poetry. The last two divisions are generally comprised in one, and distinguished as the golden age. The third period extends to the death of the emperor Marcus Aurelius (180); but from the time of Hadrian (117-138) literature was characterized by so great a decline of taste as almost to require a separate treatment. The fourth period is one of literary anarchy. Ciceronian Latin ceases to be the living model of the lit-

erary language, and the plebeian Latin gains the ascendant. The period closes with the beginning of the Gothic age, or the time of Boethius and Cassiodorus, about the year 500. Latin literature, if understood to embrace all works written in the Latin language, would reach to the present day, as men of science in Europe still occasionally write their books, especially when philological, in that ancient tongue. But the subject is here confined to the times of the growth and decay of Latin, when the language of its literature was represented by the speech of a people. Thereafter the task of the historian of Latin literature consists in following out the history of its study, and of the means whereby its knowledge has descended to our own day. This has been merged, in the present article, with the preceding account of the history of the Latin language.—*The First Period, or the Beginnings of Latin Literature.* Though it is to be supposed that Latin poetry, like that of other nations, began in the lyrical form, or, as Mommsen says, sprang out of those primitive festal rejoicings in which dance, music, and song were still inseparably blended, no remains have been preserved of the germs of the Roman epos and drama. The oldest monuments of the literature with which we are acquainted are religious chants and political documents. Among these the Salian songs are probably of the highest antiquity. They were religious litanies sung and danced by the Salii (leapers) and other priesthoods at public processions, sacrifices, marriages, and funerals. One of them, still extant, is a dance chant of the Arval brethren in honor of Mars, revealing a very primitive form of the language. Possibly also a collection of ordinances, spoken of by ancient writers as the *Leges regia* or *Jus Papirianum*, was composed at this time. It is reported that in the age of Numa was written a sort of philosophy of religion, known as *Libri Numæ Pompiliæ*; but the senate ordered the books to be burned, as heretical, before any one gained sight of them. Numerous conjectures in regard to their nature have been entertained in ancient and modern times; but it seems hardly possible that Latin culture was sufficiently advanced to produce a work of such size and spirit. The *Annales Maximæ*, named by Quintilian as the beginning of Latin prose, the clan registers, the books of oracles, and the Alban and Roman calendars, are also of great antiquity. But none of them equals in value, as an index to the state of civilization at that time, the law of the twelve tables, which is exclusively the production of Roman intelligence, and dates from about 450 B. C. Appius Claudius Cæcus, who became censor in 312, was often praised by later writers for his style and learning as a writer on matters of jurisprudence; but not one of his works has been preserved. The four epitaphs of the Scipios, one found in 1616 and the others in 1780, belonging to this period, are written in verses of Saturnian metre, and serve at best as samples

of the prevailing official style.—*The Second Period.* This comprises within two centuries and a half the entire literature of the republic, which, though very mediocre in the beginning, ends with a considerable development of poetry and prose. Greek works were then the raw material of learning and literature, and served as a foundation for the independent thoughts of the Roman people. In the archaic division of this period, the main efforts were concentrated on political labors, and the beginnings of literary grace were made. Livius Andronicus was the first who transplanted Greek literature to Rome, by causing the representation of a drama, and translating the *Odyssey*, which formed the first school book of the Latin youth. His productions exhibit neither ease nor beauty; but his successor Nævius, about 235, attained greater fluency and a more masculine rhythm, and deserves to be classed as a genuine poet. The events of the second Punic war created a desire for historical writings, which the contemporary Fabius Pictor and Cincius Alimentus attempted to satisfy, but without exercising any critical judgment on the Greek sources from which they borrowed their material, and writing chiefly in Greek. The decrees of the senate, as the *Senatus Consultum de Bacchanalibus*, dating from 186, afford a better opportunity for estimating the progress which so far had been made in Latin style. The sentences are loose, the orthography archaic, and the general form not very smooth. The best representative of the culture of this time undoubtedly was the elder Cato, a master of Latin prose in the beginning of the 2d century B. C. He was the first who wrote his mother tongue with fluency, remoulded the archaisms, and cast over them the freshness of his own spirit. His *Origines*, a work of seven books, giving the ethnography and history of ancient Italy, and replete with all manner of researches, incidents of war, and memoirs, was a valuable legacy to his countrymen. His opposition to Greek culture, though he himself possessed most varied learning, exercised a salutary influence on the growth of an independent literature. Epicurean philosophers were expelled, Greek rhetoric condemned, and permanent theatres forbidden. Only the grammatical discourses of Crates, the Pergamene ambassador, were listened to without prejudice. But the wealthy class soon turned again to Greek culture and to foreign literatures as an aristocratic adornment. With the extension of the Roman power came an influx of the treasures of Greece, Macedonia, Asia, and Libya, making the Romans depreciate the meagre products of their own civilization, but not without creating a desire for similar culture. In Cato's time appeared the father of Latin poetry, Quintus Ennius, who died in 169. He was a man of wonderful versatility, and his genius was exceedingly productive; but the chief value of his poetry was, that he abandoned the Saturnian metre, and introduced

the rhythms developed by the Greeks. In his adaptation of the Latin language to the Greek style he was naturally guilty of stretching words to uses not always admissible, but even this error was of profit to the Romans, as it showed them the great flexibility of their tongue. Cæcilius Statius (died in 168) and Mæcius Plautus profited by his lessons; but not being brought up like Ennius in the circles of Roman aristocracy, they introduced into their imitations of Grecian comedies the language, thoughts, and manners of the plebeians; their comedies, consequently, were more pleasant to look at when performed than to read. Pacuvius also was a successor of Ennius. His tragedies were more than mere translations from the Greek, and though he was no innovator in the poetic art, he was quite free and original in the treatment of foreign materials. In 166 was represented the first drama of Terence, whose imitations of Menander were rather exact and measured. His dialogues manifested good taste, and his language was perfectly exemplary and very spirited. Novius and Pomponius, writers of a later generation, were more popular poets, as they understood how imperceptibly to turn the gravity of the Romans to purposes of wit and humor. Lælius, Sulpicius Gallus, and Ælius Tubero were probably the best educated among the cultivated classes of this time; and Lucilius, their friend (about 120), created with delicate literary invention a new form of popular poetry, which deservedly grew into general favor. He was well versed in the secrets and failings of Roman society, and he used his poetic art to freely criticise them, and the ways of native law and science. While his satires had a beneficial effect upon the customs and learning of the age, it was Attius (or Accius) whose elevated pathos endowed Roman tragedy with the true fervor of poetry. He brought upon the stage the brilliant figures of the history of his country, and inspired his spectators not only with patriotic feelings, but also with a better appreciation of the poetic art. It is noticeable that so far there was neither epic nor lyric poetry. The increased moral degradation, the unequally divided property, which constantly threw the senate and the people into violent discussions, and the legal processes of enormous magnitude, called the best talents to the practice of law and the efforts of eloquence. The principles of philosophy had to serve them as handmaids. But philosophy had come to a halt even among the Greeks, and consequently was but little cultivated by the Romans. There were Epicureans and Stoics, and the latter exercised great influence on Roman jurisprudence. Empiricists of high standing were Mucius Scævola (about 95), the creator of the *ius pontificium*, and Manilius and Junius Brutus (about 134), practitioners of law. Yet public eloquence was at this time the most potent lever of literary efforts. Sulpicius Galba (149) was eminently successful, even in bad cases, through insinuating arti-

fices of pathos; and Papirius Carbo (about 105) rendered himself famous through the momentary sway of his rhetoric. But these natural-born orators were totally eclipsed by the culture, spirit, and passionate fire of Caius Gracchus. His elder brother Tiberius left no literary monument to bear witness to the greatness of his talents; but the two sons of Cornelia shared equally the admiration of their nation for legal learning and oratory. The wild partisan quarrels and the tempests of the civil war filled the political profession with men untrained by study. Scribonius Curio, Marcus Antonius the orator, and Licinius Crassus depended for their fame rather on their personal bearing and the boldness of their discourses, than on such elegance of style and artistic elaboration as would render them of value to literature. Historical works improved, though not enough to leave to posterity either a readable book or a model of historical criticism. The *Annales Maximæ*, a dry register of the most memorable events of the republic, had ceased to be kept. Zealous statesmen wrote instead the memoirs of their times, and each gave them a personal coloring, but none possessed the requisites for making a good narrative or for giving details in proportion to their interest and importance. When the remembrance of their authors had passed away, the biographical memoirs of Æmilius Scaurus (about 115), Rutilius Rufus (about 105), Lutatius Catulus (about 105), Cornelius Sulla (about 89), and generally of the closing years of the 2d century B. C., were also forgotten. Some historians, as Albinus Scipio, Acellus, and later also Lucullus, composed their works in Greek, though they could hardly expect to find readers in Greece. The attempts at writing complete histories of Rome ended in the accumulation of bulky materials, but they were failures in methodical treatment. Fannius and Cassius Hemina (about 134) wrote, though with much naïveté of conception and great meagreness, about some episodes in the history of their country; and only Sempronius Asellio shows that he had at least a perception of what is required in a history. Cælius Antipater, Claudius Quadrigarius, and Cornelius Sisenna (about 89) mark in succession the slow progress toward the perfection of historiography; for even the last and best of the three overloads his narrative with useless details, and impedes the flow of language with rhetorical flections and archaic words, both tasteless and wearisome. But the appearance of professional grammarians and rhetoricians was not without some influence on the development of the Latin language. The rhetoricians still labored under the difficulty of having no national standard literature to which they could refer for models. The study of their linguistic material led to the adoption of certain rules in regard to what should be avoided in and what should be attained by literary compositions. Ælius Stilo (about 100), Servius Claudius, Aurelius

Opilius, and Valerius Cato (about 89) were the first to distinguish themselves in grammatical and philological studies. The tragedian Attius, a fruitful poet, and the author of the *Didascalía*, a history of dramatic poetry, raised his art to a higher standing, and taught the Romans wherein it should really consist. Porcius Licinius wrote versified biographies of the poets, and furnishes thereby some evidence of an increased interest in the fortunes of literature. The Romans then began to love literary studies, and they very soon passed a just and practical judgment upon its aims and tendency. They saw the necessity of following the examples of the Greeks and heeding their lessons, and the richness of the materials which they imported raised their desire for a literature of at least equal merit. Their endeavors were crowned with results which have not unjustly given the name of the golden age to the next period. This golden or Ciceronian age was not productive of equally excellent works of poetry and prose. Poetry had so far found root only in the drama, and the sober moods of the Romans during the last stages of the republic were naturally unproductive of attempts at high poetic flights. Even the drama was losing spirit, and that it even continued to exist is due principally to the art of the actors Clodius Æsopus and Roscius. Epic poetry was composed by Hostius, Furius, and Varro Atacinus; but these versified incidents of Roman warfare met probably with less favor than the translations of the Greek epos. Varro Atacinus had some merit as a translator, Varro as a satirist, and Hortensius and Licinius Calvus as miscellaneous poets. Lævius and Helvius Cinna, burdening their poetry with learned conceits which rendered their meaning obscure, did not enjoy equal popularity. The only truly poetic mind was Lucretius Carus; his compositions are faithful reflections of the sentiment then nurtured in Roman hearts, skepticism without consolation. Rome was never more learned and erudite than at this time. Catullus, called *doctus* from his Greek learning, wrote an impassioned religious poem, the *Atys*, and one legendary heroic poem, but is best known for his exquisite lyrics, elegies, and epigrams. The universally informed Terentius Varro Reatinus, who was probably the greatest savant of antiquity, not unworthily received from his own nation the title of the "most learned of Romans." His writings are scattered over all departments of human knowledge, and he gathered the facts of early Roman history into a body of antiquities, which he never wearied of enlarging by essays on special subjects. The Romans owe to him the first foundation of a general scientific culture, and it is to be regretted that his discourses on the religions, morals, and institutions of their better days came too late to put a check to the decadence of their social life. Nigidius Figulus (about 60) was a solitary laborer in the fields of speculation and grammar, and his works are

hardly mentioned except for the unfruitful theories they contain. Pomponius Atticus (about 60), who kept a sort of factory for the multiplication of manuscripts, was probably well versed in the literature of his day, and capable of rendering a just verdict on its merits; but none of his various historical and critical writings have come down to us. Historiography and eloquence were totally remodelled in respect to plan, method, and form, and gained the highest excellence in the prose literature of this age. It is not known how great was the merit of the historical works and chronicles of Luceius (about 60), Cornelius Nepos (about 54), Atticus, and Asinius Pollio (about 40). The fragments of Nepos show only that they were written in a simple style and a sober tone, indicative of good taste. This style was carried to perfection in Cæsar's Commentaries, which are among the proudest monuments of Latin literature. But the most clear-sighted and artistic Roman historian was Sallust (about 45), whose works were largely read and closely imitated. Eloquence was greatly needed in the days of the fall of the republic, and the antagonism between the party leaders of varied culture was productive of florid rhetorical displays. Quintus Hortensius was early renowned for the Asiatic richness of his speeches, which were also models of logical arrangement. He had many imitators and rivals, and it is to be supposed that men like Cælius Rufus and Licinius Calvus exhibited equal powers of oratory, the one in ebullitions and the other in concealments of passion. Cæsar's speeches were always simple; those of Asinius Pollio equally so, but replete with archaic expressions, which were probably to be found also in the discourses of Servius Sulpicius and Marcus Calpidius. The master in this sphere of literary effort was undoubtedly Cicero, though he certainly did not occupy as high a rank in his own day as the grammarians and his disciples have since assigned to him. To many contemporaries he did not seem sufficiently brief and concrete; and though he found many imitators, there were others who considered his style too florid. Cicero made use of a large amount of well grounded information, drawn from Greek literature and native philosophy and history, and he enriched the Latin vocabulary, which hardly went beyond the most immediate needs of business and law, not only with new words, but also with new means of employing old ones. Upon the simple and untutored language was gradually reared the so-called classical Latinity, which may in a measure be regarded as Cicero's own work. Latin literature after his time was of another cast.—The Augustan age, beginning with the year after the battle of Actium (31 B. C.), and 13 years after the death of Cicero, presents indeed a great contrast. The wild days of republican anarchy had confused the morals of the nation, and a wonderful realism set in, of which the poets came to be

the most ardent exponents. Augustus, though himself hardly a literary person, did everything in his power to further literary pursuits. He rewarded prominent poets and learned men, and encouraged them by his presence at their readings and discourses. Without Augustus, Virgil's *Æneid* would probably not have been completed; Ovid's most brilliant poems were composed under the favor of his court; and even Horace, though shy of the emperor's luxurious train, could not withhold his praise of the endeavors of Augustus to raise the standard and to widen the fields of Roman literature. Libraries were organized, and public newspapers, or wall posters, were edited by the state. The wealthier classes became in their turn protectors of literary men, and constituted an audience which an author felt stimulated to address. Mæcenas, without himself coveting literary fame, was surrounded by a multitude of poets whom his clear judgment and excellent taste had drawn out of obscurity, and to whom his purse was always open. Asinius Pollio also was a warm friend of the great minds of his time, and they enjoyed the advantage of having in him an excellent judge of literary worth. Jurisprudence, grammar, and rhetoric now received more careful cultivation. The lawyers Alfenus Varus, Antistius Labeo, Trebastius Testa, and Ateius Capito distinguished themselves by numerous genuinely scientific works. The grammarians Ateius, Valgius Rufus, Julius Hyginus, and Verrius Flaccus came to be looked upon as authorities by the new generation of authors, especially the poets. The rhetoricians also began to exercise a healthy influence, principally on the style and logical sequence of compositions. The most celebrated among them were Porcius Latro, Albuçius Silus, Arellius Fuscus, and even the arrogant Greek Cestius Pius. But the glory of the Augustan age was its poetry. The poets were not such great flatterers of Augustus as is often maintained. Virgil wove into his epos the interests of the gens Julia, but otherwise the school of poetry of this age was neither officious nor untrue. There was no need of courting solely imperial favor, as the poets had warm friends among the better classes of the Roman people. They were assiduous students of Greek art, and their poems naturally abound with Græcisms and imitations, though to a less extent than is usually asserted. Many forms of Alexandrine origin were introduced, and others of common speech were reshaped according to the requirements of art. The mastery of form, correct in grammar and rhythmic flexion, rich in language, and perfect in metre, deserves the highest admiration; and its severe elaboration did not break its easy grace. This age produced every class of poetry, from the epos to the poetic epistle and the didactic poem, in equal perfection. The polished elegies of Tibullus celebrate his loves and his short martial experience in Gaul. Propertius abounded in



rich imageries; Virgil's classic phraseology remained the standard for five centuries; Ovid excelled in happy narratives; and Horace was a model of purity in language. The lesser poets, as Rabirius, Cornelius Severus, Domitius Marsus, and Æmilius Macer, though not so great as those whom the Romans at once perceived to be unrivalled masters, yet produced many poems creditable to the high company of literary artists in whose time they lived. While poetry was at high tide the noblest and most valuable prose was at ebb. Historians either modelled their accounts after the wishes of princes, or sought refuge among the events of the past. They felt that the times were against them, and their labors show that they were aware they had lost their freedom. A few, removed from political life, made good use of the libraries which were then accumulating, and formed a sort of encyclopædic surveys of the historical materials. Livy was the first to compose a general picture of the entire history of Rome, which, though written without political insight, was universally recognized as a classical production. Trogus Pompeius wrote the first Latin book on ethnography, and he also wrote excellent prose. But Labienus and Asinius Pollio, who undertook to treat the occurrences of their own day in an independent, critical spirit, were reduced to silence; and other writers of contemporary history were insignificant enough to be speedily assigned to oblivion without any special governmental decree. Nevertheless, Rome began the next period with such abundant culture that it was justifiable to expect a realization of the highest literary ideals. This, however, did not come to pass.—*Third Period.* The third period, from A. D. 14 to 180, which has long borne the title of the silver Latinity, and to which many of the high talents of imperial Rome belong, is a great disappointment. Brutal despotism, beginning with Tiberius, almost uninterruptedly and ever increasingly burdened the Roman mind until the death of Domitian. Culture was not driven out of existence, yet it was not allowed to stimulate the masses. But though the literature of the 1st century no longer spoke to a free people, it had inherited from the preceding period sufficient strength to maintain for a while at least an attitude of ease. Poetry suffered the most. Ovid, Horace, and Virgil were read and studied with avidity, but no one produced anything worthy of comparison with the poems of any of these three. During the 23 years of the reign of Tiberius, besides Manilius, Phædrus, the writer of fables, is the sole poet. Rhetoric also slowly sank from the height it had attained in the Augustan period. Voltienus Montanus, Scaurus, and Romanus Hispanus were the only rhetoricians who still evinced some degree of excellence. Tiberius himself had received a good rhetorical training, which he exhibited both orally and in writing. The unfortunate Germanicus composed several works in verse,

among them a version of Aratus's astronomy. The orator Asinius Gallus wrote a comparison of his father Pollio and Cicero. Velleius Paterculus (about A. D. 25) wrote an abridgment of Roman history in good style. Valerius Maximus made a collection of anecdotes for rhetorical purposes, most of which are dull, and all of which are put together in a very uncritical manner. A prolific writer was Cornelius Celsus, the author of a sort of encyclopædia on eloquence, jurisprudence, farming, medicine, military art, and philosophy. The principal grammarians were Julius Modestus, Pomponius Marcellus, and Remmius Palæmon; and probably also Nisus belongs to this reign. Botany was represented by Cæpio, Antonius Castor, and Apicius. The latter wrote also on cookery, and Julius Atticus and Julius Græcinus on the culture of the vine. Pomponius Secundus seems to have written several tragedies, but his works were published after the time of Tiberius. During the reigns of Caligula, Claudius, and Nero, impartial historical compositions were in disfavor. The chief author of this age was Annaeus Seneca. He wrote a faithful picture of his period, but in some portions he was more brilliant than accurate. His popular philosophical writings charmed by their fulness and fineness of observation, abundance of knowledge, elevation of thought, and dazzling style. The reader feels, however, that Seneca is not always sincere, and that his main endeavor is to please. Among his prose works is one on morals, in letters addressed to Lucilius. He left ten tragedies, all of which, though of a severe metrical treatment, are scarcely endurable for the exaggerated abundance of words and rhetorical figures. The poets Gætulicus and Servilius Nonianus wrote on subjects of contemporary history, but their works, like those of Domitius Corbulo, who described his personal adventures in Asia, and of Cornelius Bocchus, who wrote a work on chronography, are merely known from quotations. Curtius Rufus wrote an extensive history of Alexander the Great, in part extant, in a style resembling that of Seneca. Columella of Gades is known to us by his 12 books *De Re Rustica*, written in an enthusiastic style, but without artistic arrangement of materials. Asconius was a devoted student of Cicero, Sallust, and Virgil, and some of his historical commentaries, especially those on Cicero, are esteemed as of high value. The three books on chronography by Pomponius Mela give the earliest account of the ancient world which we possess. Works on philosophy were for the most part written in Greek; among them those by Sextius, Cornutus, Musonius, Rufus, and Epictetus. Of the philosophers who wrote in Latin may be mentioned Celsus, Papius Fabianus, Plautus, and especially Seneca. The Stoic doctrine was the one generally embraced, but some of its adherents diluted it into a mere system of practical wisdom, while others exaggerated it by additions from Pythagoreanism and Cynicism. Va-

lerius Probus is the most eminent grammarian of this time. The epic panegyric on the consul Piso was probably written in the reign of Claudius by an unknown author of great talents, who had an elegant flow of language, and a vast acquaintance with the literature of the Augustan age. With the bombast characteristic of this period, Persius Flaccus wrote (besides other compositions not extant) six satires, mostly versified lectures on Stoicism. A fertile writer in prose and verse was Annæus Lucanus (Lucan). His *Pharsalia*, an unfinished epic on the civil war between Pompey and Cæsar, though rather artificially pathetic, shows him to have been a man of talent, and possessed of a generous heart. Other writers of verse at this time were Cæsius Bassus, Vagellius, Curtius Montanus, and Serranus. It is believed that during Nero's reign appeared the character novel ascribed to Petronius Arbitr; it is a work of art in its way, full of humor and knowledge of human nature, and is important, though now only a heap of fragments, as representing the manners and language especially of the plebeians in that age. Here belong also a didactic poem entitled *Ætina*, probably by Lucilius Junior; a metrical version of the Iliad for school purposes; and the poems contained in the Codex Vossianus 86. Under Vespasian and Titus literature was benefited by the blessings of peace, but under Domitian it suffered greatly by his vanity and cruelty. Under the former flourished Pliny the Elder, who, in spite of his extensive official occupations, found time for great literary activity in the departments of history, grammar, rhetoric, tactics, and natural science. Of his works, only a kind of cyclopaedia of natural science, compiled frequently in haste and without adequate knowledge for the exercise of criticism, has come down to us; it is a monument of the serious, studious, and patriotic mind of the author. Cluvius Rufus produced a historical work embracing the time of Nero, and Vipstanus Messala also wrote on events which he had witnessed. Their histories, and that of Fabius Rusticus, which also seems to belong to the time of Vespasian, have at least the merit of aiming to present facts. Orators of this age were Curiatius Maternus, Julius Gabinianus, Aper, and Julius Secundus; and the most influential jurists were Cælius Sabinus, Pegasus, Urseius Ferox, and Juventius Celsus the elder. Among the poets of this time is Valerius Flaccus, whose 10 books of *Argonautica* show a diction rhetorical and full, but not lucid and symmetrical. The tragedies of Curiatius Maternus and the epics of Saleius Bassus are lost. The reign of Domitian was productive of a vast number of dilettanti whose verses only proved their insignificance and harmlessness. Domitian's hand lay heavily on all intellectual life, and in order not to endanger their liberty and honor men like Juvenal, Tacitus, and Pliny the Younger kept silent. Silius Italicus (25-101) wrote 17 books of *Pu-*

*nica*, taking the subject from Livy, and imitating Homer and Virgil. He constantly assigns mythological motives, and is monotonously strict in the technical treatment of his verse. The largest work of Papinius Statius was the *Thebais* in 12 books, which, as well as his uncompleted *Achilleis*, is exceedingly dull, though his *Silva*, five books of poems, show that he possessed good talents. Valerius Martialis left 15 books of epigrams. Martial's preference is obscenity, but he equals Ovid in ease and elegance of poetical form. Among the numerous other poets may be mentioned Arruntius Stella, Turnus, Verginius Rufus, Vestricius Spurinna, and Calenus's wife Sulpicia, who all wrote erotic verses. The most prominent prose writer of this age is Fabius Quintilianus. Quintilian composed first a work on the causes of the decay of eloquence, and then a large work (extant) on the complete training of an orator (*Institutio Oratoria*), of which the 10th book, containing a list of the literature useful for rhetorical studies, is of great value. He is never tired of praising Cicero, whose style he attempts to imitate. Besides Tullius as a writer on rhetoric, and Princeps as a rhetorician, appear the names of Aquilius Regulus, Bæbius Massa, Mettius Carus, and Palfurius Sura, who were mostly time-servers and informers. Julius Frontinus, an excellent engineer, was the author of a popular work on tactics, and of a work in two books *De Aquis Urbis Romæ*, written in a concise and refined style. Among grammarians were Æmilius Asper (an erudite commentator on Terence, Sallust, and Virgil), Claranus, and Apollinaris. A harmless historical work, which appears to have been a universal history, was composed by Junius Maximus; while Arulenus Rusticus and Herennius Senecio wrote in opposition to the government, and lost their lives. Between 96 and 117, under Nerva and Trajan, literature, though greatly on the decline, gained a large number of writers in all departments. Nerva himself took some interest in poetry, but Trajan promoted the development of literature only indirectly. The most prominent poet of the age of Trajan was Junius Juvenalis, of whom we have 16 satires eloquently and vividly describing the vices of Roman society, but not without monotony, produced by his unvarying conciseness. Among the many who composed verse at this time were Octavius Rufus, Titinius Capito, Passennus Paulus, and Caninus. The most prominent prose writer is Cornelius Tacitus, who as a historian followed the best sources, sifting them with strict criticism, and only indicating his own views, but always writing in a melancholy and bitter tone. His *Dialogus de Oratoribus* shows that he endeavored to imitate Cicero's style at least in his rhetorical works, and the biography of his father-in-law Agricola reminds us of the manner of Sallust. His *Germania*, an ethnographic monograph, is to some degree a mere comparison of the simple ways of the Germans with the cor-

ruption of Rome, and is frequently rather sentimental. His *Historiæ*, being the narrative of the events of the reigns of Galba, Otho, Vitellius, Vespasian, Titus, and Domitian, has not been entirely preserved. His *Annales* is also incomplete. The literary activity of Pliny the Younger consisted chiefly in the writing of letters for publication, extending in a studied variety over a large number of subjects. His style is fluent and egotistic, but graceful and frank. Pompeius Planta and other historians show a great preference for relating recent events. Jurisprudence was represented by Proculianus Neratius, Juventius Celsus, Javolenus Priscus, Varius Lucullus, Arrianus, Vivianus, and others. The principal grammarians were Urbanus, Velius Longus, probably also Flavius Caper, and Hyginus. Balbus wrote on geometry. During the time of Hadrian (117-138) literature suffered somewhat from the preferences of the emperor, whose own productions hardly go beyond dilettantism. The most important literary character now is Suetonius Tranquillus. His *Viri Illustres* and "Lives of the Twelve Emperors" are inaccurate in chronology, though derived from good sources; the style is rhetorical, but monotonous. Annaeus Florus wrote an abridgment of Roman history down to Augustus, which is rhetorical and inaccurate. Justinus, the historical writer, may have lived about this time; other compilers of history were Greeks and wrote in Greek. Among jurists, the most eminent was Salvius Julianus, who was intrusted by Hadrian with collecting the edicts of the prætors in the republican period; others of importance are Aburnus Valens, Pactumeius Clemens, and Pomponius. Among rhetoricians, the majority of whom wrote in Greek, the most noted were Castricius and the learned Spaniard Antonius Julianus. The principal grammarian of this age is Terentius Scaurus, who wrote on Latin grammar and poetry. Philosophical studies were chiefly represented by the Greeks, as by Plutarch and Calvisius Taurus. Cælius Aurelianus, an African author, left two badly written works on medical art. Writers of verse, mostly in iambic dimeter, were Annianus, Ælius Verus, Voconius, and others; but Hadrian's time produced no poet of great note. The time of the Antonines (138-180) closes this period. The excellent reign of Antoninus Pius did not prevent a further decline of Latin literature. The national taste was so low that a man like Fronto could be the highest authority; we have the greater part of his correspondence with Marcus Aurelius, from which he appears equally wanting in genius and taste. Erudition and the affectation of it became the fashion. Greece and the Græcized East furnished the majority of the ablest authors, who all wrote in their native language. Among the professors of archaic scholarship appear the names of Apollinaris of Carthage, Gellius, Pertinax, and Arruntius Celsus. Histor-

ical pursuits were not in great favor; it is possible that Ampelius, the author of a meagre abridgment, and Granius Licinianus belong to this time. Volusius Mæcianus wrote, besides juridical works, a treatise still extant on the divisions of money, weights, and measures. The most famous of the numerous works of Gaius, the *Res Cotidianæ* and the *Institutiones*, are exceedingly graceful, lively, and natural; the latter served as the foundation of Justinian's *Institutiones*. The poetical productions of this age are insignificant, unless the *Per-vigilium Veneris* and the jocular epic called *Vespa* were composed in it. The literature of the reign of Marcus Aurelius (161-180) remained under the influence of Fronto and his pupils Aufidius Victorinus, Servilius Silanus, and Postumius Festus. The 20 books of *Noctes Atticæ* by Aulus Gellius are very important for many departments of literature and for an accurate knowledge of this time. His diction is rather sober, but he seems to have collected his material with much care and industry. The Platonic philosopher and rhetorician Apuleius of Madaura possessed great originality, facility, and vivacity. Cervidius Scævola, the jurist, wrote 40 books of *Digesta*, which have been much used in the Pandects. In the same time Papirius Justus composed a collection of imperial constitutions, and Paturus wrote a work on military affairs.—*The Fourth Period*, 180 to 500. This is the period of the dissolution of the national literature. The emperors had little favor to bestow upon it, and could not prevent its decline. They themselves had to struggle to keep the fragments of the former imperial power together; most of those in the 3d century had little culture, and those of the next centuries still less. During the time from the accession of Commodus to the death of Septimius Severus (180-211) the Christian religion gained ground even among the educated, and was defended by the eloquent Minucius Felix and Tertullian. The former has left us the earliest extant works of Latin Christian literature, in the dialogue *Octavius*. The author had the usual philosophical and æsthetical training of his period, and he imitates ancient models in a fluent and elegant style. Septimius Florus Tertullianus is an author of much independence and genius, endowed with a lively imagination, whose eloquence often oversteps all limits. His works are all somewhat unpolished, intricate, and obscure. The great jurist Æmil-ius Papinianus is distinguished for great lucidity, and the most important of his works, the *Quæstiones* and *Responsa*, were much used in Justinian's collections. Contemporaries of Papinian were the jurists Messius, Callistratus, and Claudius Tryphoninus. In the beginning of the 3d century we have a grammar by Dositheus, but of the writings of the learned Sammonicus Serenus the elder nothing has come down to us. Among jurists of the first half of the 3d century is Ulpianus, probably the

most important, as his works were long held to be high authority, and they contain excellent materials, with pertinent criticisms in a clear style. His contemporary Julius Paulus surpassed him in fertility, but was his inferior both in accuracy and style. Three grammarians of this time enjoy some celebrity, viz., Julius Romanus, Juba, and Censorinus; their treatment was rhetorical. Gargilius Martialis wrote an extensive work on husbandry, from Greek and Roman materials. Marius Maximus wrote at length the biographies of the emperors subsequent to Nerva, but without attention to truth. Herodianus wrote in Greek a history of his time, and Dion Cassius a Roman history from the foundation of the city to the year 229. The grammarian Julius Solinus wrote worthless *Collectanea Rerum Memorabilium*, revised in the 6th century and given out again under the title of *Polyhistor*. The contents of the works of St. Cyprian (Thascius Cæcilius Cyprianus) are partly of an apologetic and partly of a practical and hortatory character; and their diction, though not admirable, at least excels Tertullian's in lucidity and correctness. Many attempted metrical composition. Such were Alfius Avitus, who wrote a history in iambic dimeters; Marianus, the author of *Lupercalia*; Septimius Serenus, who imitated Greek metres; and Sammonicus Serenus, who wrote 1,115 hexameters *De Medicina Præcepta*. Two poems of Commodianus which have come down to us are filled with an ardent Christian zeal, though executed in defiance of metre and prosody. Several emperors of the second half of the 3d century were of Thracian and Illyrian origin, raised to the throne for military valor; and when the organizing genius Diocletian, the son of a peasant in Dalmatia, attained the imperial power, the eastern influences which had penetrated all departments of life were succeeded by northern influences, and both the form and the substance of Latin literature suffered severely. In the time before Diocletian, Nemesianus wrote a didactic poem on the chase, of which the first 425 lines, which have come down to us, attest a great command of words. The history of these years was written by a number of authors, but we hear of them only through the *Scriptores Augustæ Historiæ*, who availed themselves of them. The rhetorician Aquila Romanus left a meagre and hasty little book, *De Figuris Sententiarum et Elocutionis*. Toward the end of this time it seems that Nonius Marcellus composed his extant lexical work *Compendiosa Doctrina per Litteras*, which, in spite of its great want of solid information, criticism, and accuracy, is still invaluable, as it contains numerous quotations from earlier Roman literature. With Diocletian (284-305) came the panegyric orators, who devoted their eloquence to the superhuman virtues and performances of the emperors. Gaul was now the chief home of this art, and Marseilles, Narbonne, Toulouse, Treves, and other cities had rhetoricians of their own,

whose lectures were much favored by the vivacity and linguistic versatility of the nation. Of such speeches we possess some by Maximianus Herculeus and by Eumenius of Autun. The *Scriptores Augustæ Historiæ*, as Ælius Spartianus, Valcatius Gallicanus, and Trebellius Pollio (in several cases it is doubtful to whom the authorship belongs), are all void of talent and ability, though apparently honest; these biographies form our sole historical source. A jurist named Gregorianus made a collection of the constitutions from Hadrian to Diocletian, known as the *Codex Gregorianus*; it survived, however, with the supplement by Hermogenianus, only as far as it was inserted in Justinian's codex. An *Ars Grammatica* was written by Marius Plotius Sacerdos; a metrical manual by Terentianus of Mauritania; and seven books in defence of his conversion to Christianity, but without much comprehension of the purport of the religion, by the rhetorician Arnobius, the teacher in eloquence of the famous Lactantius Firmianus, who surpasses all other Christian writers in the purity and elegance of his diction, and the more important of whose works have happily come down to us. A work of value for historical studies is a fanatical account of the end of all persecutors of the Christian religion, from Nero down to Galerius and Maximinus. A number of metrical compositions which turn on subjects of heathen mythology, such as those by Reposianus, Cæsius Taurinus, and Pentadius, belong also to the time preceding the official victory of Christianity, and the removal of the imperial residence to Constantinople, which imposed a new character on the literature of the 4th century. This is the epoch of the greatest brilliancy in the literature of the Christian religion. Constantine himself wrote memoirs, of which only scanty traces survive. He also was pleased with panegyric speeches, and Eumenius, Nazarius, Marcomannus, and Titianus were the most prominent rhetoricians of his age. Optatianus wrote a nonsensical poem in praise of the emperor, and the Spanish presbyter Juvencus a version of the Old and New Testament history in epic metre. Jurisprudence was exclusively devoted to collecting and epitomizing. Charisius was the author of juridical monographs, and Hermogenianus of the codex bearing his name and of *Epitome Juris*. A collection of legal documents, generally entitled *Fragmenta Vaticana*, was also probably made in the time of Constantine. Grammatical studies were now prosecuted without pretence to historical investigation and scholarship; the work of Cominianus seems to have been of this kind. Firmicus Maternus of Sicily wrote *Matheseos Libri VIII.*, a complete system of astrology; and a Christian writer of the same name produced a work entitled *De Erroribus Profanarum Religionum*, in which he demands the eradication of paganism. Philosophy was studied in Athens in the theosophic and theurgic manner

of the Neoplatonists, and this tendency gained ground also in Rome. About the middle of the 4th century lived Donatus, the author of several valuable works on grammar, and of commentaries on Terence and Virgil. Palladius wrote 14 books on husbandry, but without making any claim to great erudition. The historical literature of this time consists in the short abridgments of Aurelius Victor, Eutropius, and Sextus Rufus. Eloquence was practised by many, among them by Gennadius, Alcimus, and Delphidius; but the only extant Latin speech of this period is one by Claudius Mamertinus, which gives a faithful portrait of Julian's character as a prince. Hilarius (Hilary), bishop of Poitiers, was a fertile writer on theology; less prolific were the Sardinian bishop Lucifer and the bishops Phœbadius and Potamius. Rufius Testus Avienus wrote poems, chiefly didactic, on historical subjects, and manifests always great purity of form and thought. The poetical compositions of the rhetorician Magnus Ausonius have little value as poems, but are interesting for their faithful representation of the persons and affairs of his age. The requirements of Christian worship occasioned the composition of hymns, and those of Damasus (died in 384) are among the earliest which have come down to us. To this time may be assigned also the earliest Latin translation of the Bible (*Itala*), and the translation of Pelagius is not much later. From the reign of Theodosius I. polytheism became gradually extinct, and only a few circles maintained their interest in the old literature. Symmachus and Ammianus were in fact the last representatives of polytheism in literature. The fluency and elegance of Symmachus in literary composition were acknowledged even by his adversaries. Other rhetoricians of his time were Pacatus, Palladius, Saggius, and Eugenius, whom Arbogast raised to the imperial throne. Ammianus Marcellinus of Antioch wrote a continuation of Tacitus in 31 books; he honestly endeavored to tell the truth in regard to his own time, but his diction is very difficult to understand and wearisome. Philosophy was chiefly studied by men like Vettius Prætextatus, who hoped to find in it a weapon against the Christian religion. The number and importance of the Christian writers were of course daily increasing. Above all stands Ambrosius, bishop of Milan, among whose writings the letters and the funeral sermons on Valentinian and Theodosius are important for history. His hymns, which kept more closely to classical form than those of Damasus, became very famous. St. Jerome (Hieronymus of Stridon) was the most learned Christian writer; he interpreted and translated the books of the Bible, and wrote an enlarged version of the chronicles of Eusebius and the *Viri Illustres*, a history of Christian literature. Prudentius wrote poems on Christian subjects, in various metres, and not long after him Sulpicius Severus and Orosius treated history from the Christian point of view.

Medical literature was reduced to translations of Greek works, or consisted in valueless enlargements of earlier Latin works. Claudian (Claudius Claudianus) was the most important heathen author at the close of the 4th and the beginning of the 5th century. Though a native of Alexandria, he wrote principally in Latin, and imitated the diction and metres of the poets of the classical age with perfect success; his mastery in description appears very brilliantly in his "Rape of Proserpine." St. Augustine the African (Aurelius Augustinus, 354-430) is the most conspicuous intellect of this time; his diction is somewhat too ornate and verbose, but not rarely also logical and precise. A short account of universal history was written by Sulpicius Severus, whose contemporary Julius Hilario wrote a treatise on the duration of the world. Early in the 5th century lived also the Briton Pelagius, the well known founder of Pelagianism, his young friend Cælestius, the translator Anianus, and, among other Christian writers, Antiochius, Severianus, Bacharius, Sabbatius, Helvidius, and Innocentius. Macrobius wrote a commentary on Cicero's dream of Scipio, and seven books of *Saturnalia*; the rhetorician Endeledichius, a pleasant idyl on a cattle plague; Audax, some tyro-like verses on Augustine; and Lucillus, some satires which are lost. At the same time, perhaps, Arianus composed 42 Æsopian fables in elegiac metre, which were used as a school book, and frequently copied, augmented, paraphrased, and imitated. Before the conquest of the north of Africa by the Vandals, Martianus Capella wrote an encyclopædia of the seven liberal arts, a very pedantic production, which shows plainly how little the men of the 5th century were capable of liberal scientific conceptions, and more plainly an utter want of taste. The ruling nations were now barbarians, and the conquered nations submitted to them in dull despair. Rutilius Namatinus still composed lively poems, correct in formal details; Vicentius Lerinensis, under the name of Peregrinus, wrote exhortations to maintain genuine Catholic doctrine, in a comparatively educated style; and the works of the founder of papal power, the Roman bishop Leo I. (440-461), are still important for their subject matter, and interesting in their form. But by degrees literary productions became extinct, and most of those who still attempted to write proved only that the infection of barbarism was general. In the first half of this century the Gallic presbyter Salvianus wrote four books against avarice, and a work in which the misfortunes of the time are proved to be well merited punishments; but they are exaggerated, and sound rather garrulous. The aspirations and polish, combined with poverty of thought and phrases, of the Gallo-Roman literature, are eminently conspicuous in the poems and letters of Apollinarius Sidonius. Culture and literature gradually passed into the exclusive possession of the clergy. There



are some Christian poems in existence by Domnulus, and one by Mamertus Claudianus, all rather prosaic. The works of the theologians, as Arnobius (the younger), Cerealis, Gelasius, Honoratius, Salonius, Gennadius, and others, turn chiefly on the relation of the freedom of the will to mercy, and on the person of Christ; others wrote sermons and commentaries on Biblical works. The historical works of the second half of the 5th century are the history by Victor Vitensis of the persecution of the orthodox church by the Arian Vandals, and the chronicles of the Spaniard Idacius, which contain a special account of his native country. The history of the destruction of Troy by the Phrygian Dares, which became the chief source of the Trojan romances of the middle ages, is a forgery of the 5th or 6th century.—See Klotz, *Handbuch der lateinischen Literaturgeschichte* (Leipsic, 1845); Thompson, "History of Roman Literature" (London, 1852); Browne, "A History of Roman Classical Literature" (London, 1853); Munk, *Geschichte der römischen Literatur* (Berlin, 1858-'61); Sellar, "The Roman Poets of the Republic" (Edinburgh, 1863); Bähr, *Geschichte der römischen Literatur* (4th ed., 3 vols., Carlsruhe, 1866); Patin, *Études sur la poésie latine* (2 vols., Paris, 1869); Hübner, *Grundriss zu Vorlesungen über die römische Literaturgeschichte* (2d ed., Berlin, 1869); and especially Bernhardt, *Grundriss der römischen Literatur* (5th ed., Brunswick, 1872), and Teuffel, *Geschichte der römischen Literatur* (2d ed., Leipsic, 1871; English translation, 2 vols., London, 1873).

**LATINI, Brunetto**, an Italian scholar and poet, born in Florence about 1230, died there in 1294. He was the son of Bonacorso Latini, and became a leader of the Guelphs, after whose downfall he was exiled (1260), and spent many years in Paris in teaching philosophy and letters. After the overthrow of the Ghibellines he returned to Florence, where he became a friend and teacher of Dante, and in 1284 held the office of syndic. He was buried in the church of Santa Maria Novella, and he is one of the four personages commemorated by medallions in the cupola of Dante's tomb at Ravenna. His didactic poem *Tesoretto*, which he wrote, as he said, when "Florence was in her splendor," was published in Venice in 1553, besides which he composed various other works in Italian. But his fame rests on his *Livre du trésor*, a philosophical compilation, written in French, because, as he says, "he happened to be in France, and the language was more agreeable and usual than any other," Italian being as yet little used in prose at that period. The first part relates to history, theology, geography, and other subjects, and contains a remarkable allusion to the mariner's compass. The second part treats of ethics, and the third of rhetoric and the art of government. Editions of Buono-Giamboni's Italian translation were published from 1474 to 1824. The French

bibliographer, F. A. P. Chabaille, who died in 1863, published Latini's manuscripts extant in the national library of Paris in his *Documents inédits de l'histoire de France*. A project of Napoleon I. to nominate a commission for publishing the *Livre du trésor* at public expense, with commentaries, was not taken up till May 15, 1855, when it was recommended by the minister of public instruction. Dante, though praising Latini for teaching him how immortality is achieved by man, represents him as having committed a crime, which, according to one of the commentators, refers to a charge of forgery, but which had been indignantly denied by Latini in his *Tesoretto*.—See Ortolani's essay, included in his *Pénalités de l'Enfer de Dante* (Paris, 1874).

**LATINUS**, a king of Latium, and father of Lavinia, whom he gave in marriage to Æneas. (See ÆNEAS.)

**LATITUDE** (Lat. *latitudo*, breadth). **I.** In geography, the distance of a place on the earth's surface from the equator, N. or S., reckoned in degrees, minutes, and seconds of the great circle constituting the earth's polar circumference. (See DEGREE.) Technically expressed, the latitude of a place is its distance from the equator, measured by the angle which the horizon plane of the place makes with the equator, or by the angle which a plumb line at the place makes with the plane of the earth's axis. It is therefore equal to the altitude of the pole of the heavens above the horizon. There are several ways of determining the latitude of a place. 1. The elevation of the pole star, corrected for the effects due to the star's motion round the real pole of the heavens, and for refraction, aberration, &c., gives the latitude. 2. The latitude may be determined by observing the altitude of a known star, when on the meridian; for manifestly the known north polar distance of the star added to the meridian altitude, corrected for refraction, aberration, &c., is the supplement of the altitude of the pole of the heavens, which altitude, as we have seen, is equal to the latitude of the place of observation. 3. If the altitudes of circum-polar stars above and below the pole be observed, the mean of these altitudes (corrected for refraction, aberration, &c.) is the altitude of the pole; that is, is the latitude. 4. The latitude can be determined by an extra-meridional observation of a star at a known hour. For in this case we have: 1, the star's polar distance; 2, the zenith distance at the time (which is the complement of the observed altitude corrected for refraction, aberration, &c.); and 3, the hour angle. That is, we have two sides and an angle (opposite to one of them) of the spherical triangle which has for its angular points the pole, the zenith, and the star. Hence we can determine the third side, which is the zenith distance of the pole, that is, the complement of the latitude. 5. If a star be observed when on the prime vertical, the latitude becomes known without an exact knowl-

edge of the hour, which the preceding method requires. For then we have in the right-angled spherical triangle which has for its angles the star, the pole, and the zenith, two sides known, viz., the polar distance of the star and its zenith distance. The third side, as in the last case, is the co-latitude. This method is more exact in its results if the observation is made with a carefully oriented transit instrument, and the star observed during both the eastern and the western passage of the prime vertical. 6. In Sumner's method, the altitude of a star is observed twice, a known interval of time separating the two observations. 7. The altitude of a star may be determined by observing the meridian altitude of the sun, the polar distance of the sun at the epoch of observation being known from the ephemeris for the year. II. In astronomy, the distance of a heavenly body from the ecliptic, measured by the arc of a great circle perpendicular to the latter, intercepted between the ecliptic and the body. The heliocentric latitude of a planet is its distance from the ecliptic, such as it would appear from the sun.

**LATITUDINARIANS**, the name given specially to certain theologians of the Anglican church, in the latter part of the 17th century, who were generally low churchmen of Arminian principles, aiming to give a philosophical tone to theological discussions, and admitting a greater latitude of doctrine than was allowed either by the Presbyterians and Independents or by the stricter Episcopalians. Most of them were connected with the university of Cambridge. Among the more distinguished of them were Henry More, Cudworth, Chillingworth, Hales, Wilkins, Gale, and Tillotson.—See the "Principles and Practices of certain Modern Divines of the Church of England, abusively called Latitudinarians, truly Represented and Defended by Way of Dialogue," by Fowler, bishop of Gloucester (London, 1670).

**LATIUM**, one of the principal divisions of ancient Italy. The name is variously derived from Latinus, who more probably owed his to that of the region; from *latere*, to be hidden; from *latus*, broad, &c.; but hardly any of the derivations are satisfactory. The boundaries of Latium varied in different periods of Roman history. In the earliest times the name designated a small tract of land S. of the Tiber, inhabited by the Latins; it subsequently extended as far S. as the promontory of Circeii and Anxur or Terracina; and in its latest and widest acceptation it included the lower valley of the Liris, and embraced all the land between the Tiber, the territories of the Sabines and Samnites, Campania, and the Tyrrhenian sea. Pliny calls the southernmost part *Latium Adjectum*, in contradistinction to *Latium Antiquum*. The greater part of the whole territory is an undulating plain, gradually rising from the seashore to the Apennines, with an isolated range of mountains, Mt. Albanus, of which Mt. Algidus and the Tusculan hills are

branches. A part of the coast land between Antium and Terracina was gradually converted into the Pontine marshes by the waters of various streams which found no outlet; all other parts of Latium were renowned for fertility. In the vicinity of Campania some of the choicest wines of Italy were produced. Among the towns of Latium conspicuous in the history of Rome we find, besides the eternal city itself, Alba Longa, Lavinium, Antium, Corioli, Ardea, and Tusculum. The most ancient inhabitants of Latium, the Siculi, were expelled by a people of Pelasgic descent, who there became known as Latins, or *Prisci Latini*, in contradistinction to the later Latin subjects of Rome. They formed a league of 30 cities, of which Alba was subsequently the head. Alba succumbed to Rome, one of its colonies, under Tullus Hostilius, and other Latin towns soon after. Rome entered the league under its sixth king, and became its head under the next and last. On the fall of the Tarquins the Latins regained their independence, and struggled long against the republic to maintain it; but it was finally overthrown by the great victory of the Romans near Mt. Vesuvius (340 B. C.). Several of their towns received the Roman franchise, and others were converted into allied towns, under the general name of *Nomen Latinum*. During their independence, the Latin towns, mostly built on the top of steep and fortified hills, were governed by dictators elected annually, senates, and popular assemblies. Their common meetings, in which federal questions were discussed, were held in a sacred grove at the foot of Mt. Albanus, on the top of which stood a temple of Jupiter Latiaris. An ancient festival in honor of that divinity was adopted by the Romans, retaining its name of *Feria Latina*.

**LATONA** (Gr. *Λητώ*), in Grecian mythology, a daughter of the Titan Cœnus and Phœbe, and mother of Apollo and Diana by Jupiter, to whom she was married before he wedded Juno. It is only by later writers that she is described not as the wife but concubine of Jupiter. According to the fable, Latona, when pregnant, and persecuted by the jealous Juno, could find no rest, the earth being afraid to receive her, while she was constantly pursued by the serpent Pytho. Finally she came to the floating isle of Delos, which gave her refuge, or which, as some accounts state, was created for her after all other parts of the earth had been cursed should they afford her rest. Symbolically Latona seems to have signified the primitive darkness whence sprung Apollo, or the light. She was worshipped only in connection with her children.

**LATOUR**, *Antoine Tenant de*, a French author, born at St. Yrieix in 1808. He studied at Dijon, and at the normal school in Paris, under Michelet, and subsequently became professor in various colleges and a preceptor of the duke of Montpensier, in whose service he remained in exile, as secretary, after the revolution of

1848. He has published several volumes of poems and miscellaneous writings, and has translated into French *Le mie prigioni* of Silvio Pellico, the memoirs of Alfieri, and the dramatic and epic poetry of Manzoni. Among his other works are: *Séville et l'Andalousie* (2 vols., Paris, 1855); *Tolède et les bords du Tage* (1860); *L'Espagne religieuse et littéraire* (1863); *Études littéraires sur l'Espagne contemporaine* (1864); and *Espagne, traditions, mœurs et littérature* (1873). Two volumes of his translation of Calderon appeared in 1873.

**LATOUR D'AUVERGNE, Théophile Malo Corret de**, a French soldier, born at Carhaix, Brittany, Nov. 23, 1743, fell at Oberhausen, Bavaria, June 27, 1800. He entered the French army in 1767, and subsequently the Spanish, and in 1782 served at the siege of Port Mahon. In the service of the French republic he distinguished himself at Chambéry and in the Pyrenees. He refused promotion, saying that he was only fit to command a company of grenadiers. All the grenadier companies being however united in one, he found himself, while still retaining the simple title of captain, at the head of 8,000 men, who as a part of the vanguard of the army soon became the terror of the enemy under the name of "the infernal column." After the peace of Basel (1795) he retired from service, and devoted himself to literary work. Making a sea voyage for his health, he was taken prisoner by an English privateer, but was exchanged in 1797. He re-entered the army as substitute for the son of a friend, fought under Masséna in Switzerland, rejoined his own company in Germany in 1800, and fell by the lance of a uhlan, exclaiming that it was in this manner he wished to die. Napoleon, by order of the directory, at one time sent him a sword with an inscription declaring him to be the first grenadier of France, which he refused to accept, saying: "Among us soldiers there is neither first nor last." A monument was erected on the spot where he fell, and his heart, embalmed and kept in a silver vase, was carried by his company. His name continued till 1814 to be called at roll, when the oldest sergeant answered: "Died on the field of honor." He was the author of a work entitled *Nouvelles recherches sur la langue, l'origine et les antiquités des Bretons* (Bayonne, 1792; reprinted with the title *Origines gauloises*, Hamburg, 1802).

**LATREILLE, Pierre André**, a French naturalist, born in Brives, Nov. 29, 1762, died in Paris, Feb. 6, 1833. He belonged to a poor though distinguished family, and owed his education to friends, one of whom, a merchant, by lending him works on natural history, awoke in him a love for that study. In 1778 the baron d'Espagnac, governor of the Hôtel des Invalides, placed him in the college of Cardinal Lemoine. He studied theology, and was ordained priest in 1786, after which he retired to Brives, where he passed his leisure in the study of entomology. In 1788 he returned to Paris,

where he became intimate with Fabricius, Olivier, and Bosc, and brought to the notice of Lamarck several rare and curious plants. He published at this time a treatise on entomology, and contributed to the *Encyclopédie méthodique*. The revolution drove him from Paris. He was arrested and sentenced to transportation, but the naturalists Bory de Saint-Vincent and Dargelas obtained his freedom. He was again arrested in 1797 as an *émigré*, but was once more saved by influential friends. In 1798 he was placed in charge of the entomological department of the museum of natural history. In 1814 he was elected a member of the academy of sciences. He was appointed assistant professor to Lamarck, and succeeded him in 1829. His writings are very voluminous. Those best known are: *Histoire naturelle des crustacés et des insectes* (14 vols., 1802-'5); *Histoire naturelle des fourmis* (1802); *Genera Crustaceorum et Insectorum* (4 vols., 1806-'9); and *Cours d'entomologie* (1831). He also wrote parts of the "Natural History" of Buffon, and of the entomological part of the *Règne animal* of Cuvier.

**LATUDE, Henri Masers de**, a French prisoner of state, born near Montagnac, March 23, 1725, died in Paris, Jan. 1, 1805. He entered the army while young, but in 1748 went to Paris to study mathematics. Being ambitious of making himself known at court, he obtained an interview with Mme. de Pompadour, and informed her that he had seen a box placed for her in the post, probably for no good purpose. The box came, filled with a harmless powder; and ascertaining that Latude himself had sent it, the marchioness had him cast into the Bastille, May 1, 1749, whence he was transferred to the prison of Vincennes. On June 25, 1750, he escaped, but six days afterward voluntarily gave himself up to the king, who sent him again to the Bastille. The marchioness, piqued that he had not applied to her for mercy, procured his confinement for 18 months in a dungeon, after which he was placed in an ordinary room of the prison. From this place he escaped, Feb. 25, 1756, by means of a long rope ladder prepared with wonderful perseverance from a quantity of linen, and fled to Amsterdam, where he was again arrested on June 1, and reconducted to the Bastille. He was now confined in a dungeon, chained hand and foot, and obliged to sleep upon straw without any covering. While in this condition he submitted to the government some projects of public utility, one of which was adopted, but procured him no better treatment; but in 1762, his dungeon becoming untenable, he was removed to an upper room. In 1764 Mme. de Pompadour died, and Latude, having learned the fact, petitioned Sartine, lieutenant general of police, for his liberty. Sartine demanded the name of the person who had given him the information, and as Latude refused to betray the secret he was doubly ironed and kept on bread and water. Having been removed to Vin-

cennes he again escaped, was again arrested, and finally, after the death of Louis XV., was liberated through the influence of Malesherbes, June 5, 1777. But he was soon after rearrested and thrown into a dungeon at Bicêtre, where he remained for many years. Mme. Legros, having learned his history, determined to obtain his liberty, and at length, with the assistance of the cardinal de Rohan and Mme. Necker, procured his release, March 18, 1784, with the allowance of a small pension, and took him into her house. The French academy decreed a prize to Mme. Legros, in the same year, for her efforts in behalf of Latude. The day after the taking of the Bastille Latude reclaimed his papers and other memorials of his first imprisonment. The whole were publicly exhibited with his portrait in the court of the Louvre, and were instrumental in exciting the populace. In 1793 he brought suit for damages against the heirs of Mme. de Pompadour, and was awarded the sum of 60,000 livres, of which he received only 10,000. He published a *Mémoire de M. de Latude, ingénieur* (Paris, 1789), and several essays. The advocate Thierry published *Le despotisme dévoilé, ou Mémoires de Latude* (3 vols., 1791-'2); and in 1838 was published at Paris *Mémoires inédites de Henri Maseurs de Latude*.

**LAUBAN**, a town of Prussia, in the province of Silesia, on the Queis, 38 m. W. S. W. of Liegnitz; pop. in 1871, 9,082. It has three Protestant churches, a Catholic church, a gymnasium, an orphan house, a public library, a considerable weaving industry, and a brisk trade. It was founded in the 10th century, destroyed during the Hussite wars, and rebuilt in 1435.

**LAUBE, Heinrich**, a German author, born at Sprottau, Prussian Silesia, Sept. 18, 1806. He completed his studies in Halle and Breslau, and was a teacher in Silesia till 1832, when he removed to Leipsic, and subsequently accompanied Gutzkow to Italy. He was expelled from Saxony in 1834, and under arrest in Berlin during nine months, on account of his liberalism, and the publication of his writings was interdicted. He married in 1836 the widow of Professor Hänel of Leipsic, travelled extensively, and resided in that city till 1848, when he became a member of the Frankfort parliament. He resigned in March, 1849, and from the close of that year till 1867 he was director of the court theatre in Vienna, and in 1869-'70 of the new city theatre at Leipsic. In 1872 he founded the city theatre in Vienna, and retired in October, 1874. He acquired celebrity as a representative of the political and literary school of "Young Germany," and published dramas, novels, books of travel, and miscellaneous writings. His principal works are: *Das neue Jahrhundert* (2 vols., Fürth and Leipsic, 1832-'3); *Das junge Europa* (4 vols., Mannheim, 1833-'7); *Reisenovellen* (6 vols., 1834-'7); *Die Gräfin Chateaubriand* (3 vols., Leipsic, 1843); *Das erste deutsche Parlament* (3 vols., 1849); *Der deutsche Krieg* (9 vols., 1863-'6);

and his *Dramatische Werke* (11 vols., 1845-'68). Among his successful comedies is *Die Karlsschüler*, and his finest drama is *Graf Essex*. His later works comprise *Das Burgtheater zu Wien* (1868), *Demetrius*, a dramatic poem (1869), and *Das norddeutsche Theater* (1872).

**LAUD, William**, an English prelate, archbishop of Canterbury, born in Reading, Berkshire, Oct. 7, 1573, executed on Tower hill, London, Jan. 10, 1645. The son of a wealthy clothier, he was educated in the grammar school of his native town, till in his 16th year he entered St. John's college, Oxford, where he obtained a scholarship in 1590 and a fellowship in 1593. He received clerical orders in 1601, became chaplain to Charles Lord Mountjoy, earl of Devonshire, in 1605, and, though holding marriage to be an indissoluble sacrament, performed the rites of matrimony between that nobleman and Lady Rich, whose first husband was still living. He was appointed chaplain to Bishop Nene in 1608, and had held several minor livings when in 1611 he was elected president of St. John's college, Oxford, and became one of the royal chaplains. In 1616 he was presented to the deanery of Gloucester, accompanied King James to Scotland in 1617, became prebendary of Westminster in 1620, and was raised to the see of St. David's in 1621, when he resigned his presidency. In 1622 took place his famous conference with the Jesuit Fisher, in presence of the duke of Buckingham. The result was, according to his diary, that he became "C." to Buckingham; the initial is usually believed to stand for confessor. Under the patronage of this nobleman his rise was rapid. In 1624 he was made a member of the court of high commission, in 1626 bishop of Bath and Wells, in 1627 a privy councillor, and in 1628 bishop of London. He became the confidential adviser of Charles I. in ecclesiastical affairs, succeeded Buckingham in the royal favor, and began to play a foremost part in politics. His first object was to force the Puritans and other dissenters to conformity. "Under his direction," says Macaulay, "every corner of the realm was subjected to a constant and minute inspection. Every little congregation of separatists was tracked out and broken up. Even the devotions of private families could not escape the vigilance of his spies. Such fear did his rigor inspire, that the deadly hatred of the church, which festered in innumerable bosoms, was generally disguised under an outward show of conformity." In 1628 Dr. Leighton, a Scottish theologian, published a book entitled "Sion's Plea against the Prelacy." At the instigation of Laud he was brought before the star chamber in 1630, was condemned to pay a fine of £10,000, was twice publicly whipped and pilloried in Cheapside, had his ears cut off, his nostrils slit open, and his cheeks branded with the letters S. S. (sower of sedition), and was imprisoned 10 years in the Fleet. Laud was now intimately associated with the earl of

Strafford, of whose principle of "thorough" he approved. He became chancellor of Oxford in 1680, of which university he was a liberal benefactor, and was present in 1683 at the coronation of the king in Scotland, urging the forced establishment of episcopacy and uniformity in that country, which resulted in revolt and the adoption of the national covenant. On his return he was promoted to the see of Canterbury, began his administration by the republication of the "Lawful Sunday Sports," and enforced an exact observance of the rubric and a uniform discipline in the cathedral churches. He indicated his preference in the bestowment of benefices for single over married men. His diary records that a cardinal's hat was offered to him, which he declined with the answer that "something dwelt within me which would not suffer that till Rome was other than it is." He became one of the committee of trade and the king's revenue in 1634, a commissioner of the treasury soon after, and a censor of the press under a decree of the star chamber in 1637. The clergy at that time held probably a larger share in the government of England than at any subsequent period. The public odium against Laud caused by his principles and his overbearing temper was greatly increased when the star chamber sentenced Prynne, Burton, and Bastwick to be fined and maimed for libels "against the hierarchy of the church." Immediately after the meeting of the long parliament in 1640 he was impeached for high treason and committed to the tower. After an imprisonment of more than three years, he was brought to trial, defended himself with ability and often with success through a long and wearisome process, and was condemned and executed by a sentence that is now admitted to have been unjust and illegal. His diary was published by Wharton in 1694. The first edition of his complete works is in the "Library of Anglo-Catholic Theology" (6 vols., Oxford, 1847-'9), and a complete edition, including his letters and miscellaneous papers, was published in Oxford in 1857-'60. His principal biographers are Prynne (1644), Heylin (1671), Lawrence (1829), Le Bas (1836), and Baines (1855).

**LAUDANUM**, a name of uncertain origin applied to several tinctures of opium; it should be restricted, however, to the official tincture, which is prepared with  $2\frac{1}{2}$  oz. troy of opium to 2 pints of menstruum consisting of equal parts of water and alcohol. About 13 minims of 25 drops of this tincture are equivalent to a grain of opium. The strength of laudanum may be increased on exposure to evaporation; and when after standing some time it becomes thick, it should be administered with caution, especially to infants. The laudanum of Sydenham is a wine of opium, prepared with saffron, cinnamon, and cloves. It is nearly equivalent to the United States official wine of opium, and is slightly stronger than ordinary laudanum. (See **OPTUM**.)

**LAUDER, Robert Scott**, a Scottish artist, born at Silver Mills, near Edinburgh, in 1803, died April 21, 1869. Showing a taste for art in his youth, he was enabled by Sir Walter Scott to pursue his studies in the trustees' academy, Edinburgh. Subsequently he passed five years on the continent, and in 1838 established himself in London. In 1849 he returned to Edinburgh, where he resided until his death. His best pictures were suggested by scenes in Scott's novels, and comprise "The Trial of Effie Deans," well known by the engraving of it, "Meg Merrilies," "Claverhouse ordering Morton to be Shot," &c. He also produced large Scriptural compositions, one of which, "Christ teaching Humility," was purchased by the Scottish association for the encouragement of art as the commencement of a Scottish national gallery.

**LAUDER, William**, a Scottish literary adventurer, born in the early part of the 18th century, died in Barbadoes in 1771. He was educated at the university of Edinburgh, and failed in several attempts to procure a professorship there, through dislike of his character and disposition. In 1739 he published an elegant edition of sacred Latin poems by Arthur Johnston and others. A few years later he established himself in London as a teacher of Latin, and proposed to publish by subscription an edition of the Latin poetry of Grotius, Masenius, and others, of which only 2 vols. appeared (1752-'3). In January, 1747, he began to publish in the "Gentleman's Magazine" a series of papers, the object of which was to show that Milton, in composing his "Paradise Lost," had borrowed largely from Masenius, Staphorstius, Grotius, and other writers. The substance of these appeared in his "Essay on Milton's Use and Imitation of the Moderns in his 'Paradise Lost'" (1751), the preface and postscript of which were written by Dr. Johnson. A pamphlet by John Douglas, afterward bishop of Salisbury, in vindication of Milton from the accusation of plagiarism, showed that many of the passages cited as plagiarisms had been interpolated from Alexander Hog's Latin translation of "Paradise Lost." Lauder, unable to meet the charge of forgery and imposition, signed a confession of his offence, in the form of a letter to Dr. Douglas, dictated by Dr. Johnson; but he nevertheless published in 1754 another work impugning the fame of Milton, entitled "The Grand Impostor, or Milton detected of Forgery against King Charles the First;" an answer to which, supposed to be from the hand of Johnson, appeared in the "Gentleman's Magazine" of the same year. He subsequently emigrated to Barbadoes, where he kept a school.

**LAUDERDALE, I.** The N. W. county of Alabama, bordering on Tennessee and Mississippi, and bounded S. and W. by the Tennessee river; area, 672 sq. m.; pop. in 1870, 15,091, of whom 5,170 were colored. The surface is hilly, and the soil fertile. Iron ore and limestone abound.



The Florence branch of the Memphis and Charleston railroad terminates at the county seat. The chief productions in 1870 were 24,126 bushels of wheat, 447,155 of Indian corn, 12,526 of oats, and 5,457 bales of cotton. There were 2,380 horses, 1,115 mules and asses, 2,964 milch cows, 4,288 other cattle, 5,984 sheep, and 16,196 swine. Capital, Florence.

**II.** An E. county of Mississippi, bordering on Alabama, and drained by branches of the Chickasawha river; area, 700 sq. m.; pop. in 1870, 13,464, of whom 6,411 were colored. The Mobile and Ohio, the Alabama and Chattanooga, the Alabama Central, and the Vicksburg and Meridian railroads traverse it. The chief productions in 1870 were 140,250 bushels of Indian corn, 23,902 of sweet potatoes, and 3,683 bales of cotton. There were 895 horses, 561 mules and asses, 2,040 milch cows, 4,218 other cattle, 2,314 sheep, and 7,276 swine. Capital, Marion.

**III.** A W. county of Tennessee, separated from Arkansas by the Mississippi, bounded N. in part by Forked Deer river, and S. by the Big Hatchie; area, about 350 sq. m.; pop. in 1870, 10,838, of whom 8,484 were colored. The surface is level or undulating, and the soil fertile. The chief productions in 1870 were 18,669 bushels of wheat, 443,809 of Indian corn, and 6,337 bales of cotton. There were 1,992 horses, 1,123 mules and asses, 2,799 milch cows, 4,727 other cattle, 3,118 sheep, and 22,086 swine. Capital, Ripley.

**LAUDON**, or **Loudon**, **Gideon Ernst**, baron, an Austrian general, born at Trotzen, Livonia, Oct. 10, 1716, died at Neutitzschein, Moravia, July 14, 1790. He was descended from an ancient Scottish family, settled for several centuries in Livonia, and at 15 years of age entered the Russian military service, from which he retired after the peace of Belgrade in 1739, with the rank of lieutenant. Having unsuccessfully applied to enter the service of Frederick the Great of Prussia, he went to Vienna, and received in 1742 a captain's commission in Trenck's corps of pandours, and fought with reputation in the campaigns of Bavaria and the Rhine in 1742-'4. At an affair of outposts near Saverne he was wounded and taken prisoner, but was exchanged, and participated in the second Silesian war against Prussia. Disgusted with the cruelties of his commander, he left the corps, and after the peace of Dresden (1745) remained for several years in obscurity and poverty. Having at length procured a major's commission in a regiment stationed on the Turkish frontier, he married, embraced the Catholic religion, and devoted much time to the study of mathematics and tactics. At the breaking out of the seven years' war he was appointed lieutenant colonel of a partisan corps charged with supporting the movements of the Austrian army, and in a single year, by his activity, courage, and capacity, acquired the rank of general, notwithstanding that the battles in which he participated were generally disastrous to the Austrians. His commission

of general having fallen into the hands of Frederick, the latter sent it to him with a congratulatory letter. In 1758 he contributed to raise the siege of Olmütz, and harassed the retreat of Frederick, receiving for his services the rank of lieutenant field marshal. The next year he crossed the Brandenburg frontier to cover the operations of Marshal Daun, and ended a series of brilliant exploits by deciding the rout of the Prussians at the decisive battle of Kunersdorf, Aug. 12, 1759. Receiving the rank of *Feldzeugmeister*, he gained the battle of Landshut, June 29, 1760, took the fortress of Glatz, and covered the retreat of Daun after the Austrian defeat at Liegnitz, Aug. 15, with so much skill that Frederick exclaimed: "We must learn from Laudon how to retreat; he leaves the field like a conqueror." He crowned his achievements in the seven years' war by taking by assault, without previous investment, Oct. 1, 1761, the important city of Schweidnitz, filled with provisions and munitions of war. During the peace which succeeded he was employed with credit in various public capacities, and in 1766 became a member of the aulic council of war, and in 1769 commandant general of Moravia. For a number of years he lived in retirement at his estate near Vienna, devoting himself to his favorite studies; but upon the breaking out of the Bavarian war of succession he took the field in Bohemia, and by a skillful concentration of his forces on the Isar prevented a junction between Prince Henry of Prussia and Frederick, thereby securing a decided advantage to the Austrians. In 1778 he was made field marshal. His military career terminated with the campaign against the Turks in 1788-'9, the first act of which he brought to a successful conclusion by the capture of Belgrade, for which he was appointed generalissimo. He died soon after removing to his headquarters in Moravia, whither the emperor Leopold II. had sent him after the Turkish war. He was simple in his manners and tastes, averse to securing influence by flattering the weaknesses of the great, and beloved by his troops.

**LAUDONNIÈRE**, **René Goulin de**. See **REBAULT**, **JEAN**.

**LAUBENBURG**, a duchy of northern Germany, since 1865 united with the crown of Prussia, but in point of administration entirely independent. It borders on Lübeck, Mecklenburg, Hamburg, and the Prussian provinces of Hanover and Schleswig-Holstein; area, 454 sq. m.; pop. in 1871, 49,546, all but 155 belonging to the Evangelical church. It has a very fertile soil, extensive forests, and a number of picturesque lakes. The principal river is the Elbe. The chief products are corn, vegetables, flax, hemp, fruit, and lumber; agriculture and cattle breeding are the occupation of the majority of the inhabitants. The diet of the duchies consists, according to the constitution of Dec. 20, 1853, of the *Erblandmarschall*, an office which is hereditary in the family of

Bülow, 2 provincial councillors, and 15 deputies chosen for six years (5 of the noble estates, 5 of the towns, and 5 of the peasants' estates). The provincial councillors are appointed for life, and constitute with the *Erblandmarschall* the *Landrathscollgium*, which shares with the government the right of convoking the diet. The government of the duchy consists of a president (*Landdrost*) and two councillors at Ratzeburg, subordinate to the minister for the duchy of Lauenburg, who resides at Berlin. From 1865 to 1874 this office was held by Prince Bismarck. The highest judicial resort is the supreme court of appeal at Berlin. In the budget for 1873, the revenue and expenditure were estimated at \$313,000 each. The public debt amounted to \$1,224,000. The capital is Ratzeburg, and there are only two other towns, Lauenburg and Mölln.—Henry the Lion of Saxony conquered the duchy of Lauenburg from the Slavic tribe of the Polabs (*i. e.*, dwellers on the Elbe). It then remained for some time a subject of dispute between his descendants and the Saxon dukes of the Ascanian line, until in 1227 it was occupied by Albert I. of Saxony, whose younger son, John I., became in 1260 the founder of a separate line, Saxe-Lauenburg, which became extinct in 1689. In accordance with a family pact, concluded in 1369 with the house of Brunswick-Lüneburg, the duchy fell to the duke of Brunswick-Lüneburg-Celle, after whose death it was inherited by George I., elector of Hanover and king of England. In 1810 it was incorporated with the French department of Bouches-de-l'Elbe; in 1813 it was reoccupied by Hanover, and in 1815 ceded to Prussia, which in the same year transferred it to Denmark in exchange for Swedish Pomerania. By the peace of Vienna, 1864, it was ceded by Denmark to Austria and Russia; and by the convention of Gastein, Aug. 14, 1865, Austria, in consideration of a sum of 1,875,000 thalers, left it to the sole possession of the king of Prussia, who formally took possession of it as duke of Lauenburg, but without consolidating it with his other dominions.

**LAUGIER, Auguste Ernest Paul**, a French astronomer, born in Paris in 1812, died there, April 5, 1872. He was a son of the chemist André Laugier (1770-1832), and a brother of the medical writer Stanislas Laugier (1799-1872). He studied under Arago, became connected with the observatory of Paris, and was employed in naval examinations. He was the first to define the proper motion of solar spots. His discovery and calculation of a telescopic comet in 1842 won for him the Lalande gold medal, and in 1843 he succeeded Savary in the academy of sciences, of which he was president for some time. At the request of Humboldt he was engaged for some years in the improvement of the construction of astronomical clocks. In 1853 he made an exact determination of the latitude of the Paris observatory, estimating it at  $48^{\circ} 50' 11''$ , differing considerably from the earlier deter-

mination of Arago and Mathieu. In 1857 he published a catalogue of the declination of 140 stars, having previously issued one of 53 nebulae. He was associated with Arago in researches on the physics of the globe, and in magnetic and photometric labors; and for a long time he made the observations on the declination and inclination of the magnet for the bureau of longitudes.

**LAUGIER, César de Bellecour**, count de, an Italian soldier and author, of French origin, born at Porto Ferrajo, Elba, Oct. 5, 1789. He served in the French and Italian armies, distinguishing himself in May, 1848, at Curtatone, at the head of the Tuscan forces, against the Austrians; but in 1849 he opposed the Tuscan patriots in the interest of monarchy, and was obliged to seek refuge in Piedmont until the restoration of the grand duke Leopold II., after which he was minister of war till October, 1851. He is one of the most voluminous and able writers of Italy; his principal work is *Fastes et vicissitudes des peuples italiens de 1801 à 1815* (13 vols., Florence, 1829-'32).

**LAUGIER, Jean Nicolas**, a French engraver, born in Toulon in 1785, died near Paris in 1865. He studied under Girodet in Paris, and in the school of fine arts. His engravings of Delorme's "Hero and Leander" (1817), and of Gros's "Plague-stricken at Jaffa" (1831), received gold medals. His subsequent works comprise engravings after Leonardo da Vinci, Raphael, Titian, and other masters, Poussin's "Trance of St. Paul," David's "Leonidas at Thermopylae," and Girodet's "Pygmalion and Galatea," and his portrait of Chateaubriand. While at the Boston athenæum he made a drawing of Stuart's portrait for Léon Coignet's picture of Washington.

**LAUMONITE** (called by Werner efflorescing zeolite, from its property of crumbling at the touch after exposure to the air), a mineral found in cavities in amygdaloidal rocks, and also in syenite and porphyry; named after Laumont the mineralogist, who first observed it in 1785 in the lead mines in Brittany. It occurs in crystals of the form of oblique rhomboidal prisms, and also in lamellar masses. The color is yellowish or grayish white; it is transparent, and has a vitreous lustre, but becomes opaque and usually pulverulent on exposure; hardness 3.5-4; specific gravity 2.3-2.4. In composition it is a hydrated silicate of alumina and lime, a specimen from Phippsburg, Me., giving the following proportions of its ingredients: silica 51.98, alumina 21.12, lime 11.71, and water 15.05=99.86. Some varieties are so liable to effloresce and fall to fine powder, that they can be preserved only by a coating of gum arabic, or by keeping them in moist air. The mineral is found principally in the Faroe islands, the Hebrides, Greenland, and Switzerland, but occurs also on the N. shore of Lake Superior, at Bergen Hill, N. J., and at Port George, Nova Scotia, where the veins are sometimes 3 in. thick.

**LAUNAY, Emmanuel Louis Henri de.** See AN-TRAIGUES.

**LAUNCESTON,** a town of Tasmania, on the Thamar, 90 m. N. by W. of Hobart Town; pop. in 1870, 10,668. There were 22 churches, a grammar school, 33 private schools, three public schools under the board of education, a mechanics' institute with a library of 5,800 volumes, five banks, and three newspapers. Steamers run to Melbourne twice a week, and to Tasmanian ports at less frequent intervals. The town was incorporated in 1858.

**LA UNION,** a seaport town of San Salvador, on the S. W. shore of the subordinate bay of its own name, forming a part of the bay of Fonseca, 100 m. E. by S. of San Salvador city; pop. about 2,000. The situation of the town, in front of the volcano of Conchagua, renders it an extremely hot and unhealthy place. It is nevertheless one of the principal ports of the republic. The aggregate tonnage of the shipping is about 35,000 annually. A railroad to connect La Union with San Miguel was reported in active progress in 1873.

**LAUNITZ.** I. Nikolaus Karl Eduard Schmidt von der, a German sculptor, born at Grobin, Courland, Nov. 23, 1797, died in Frankfort, Dec. 12, 1869. He studied at Rome under Thorwaldsen, whom he assisted in restoring the Æginetan marbles. He spent his last 40 years chiefly in Frankfort, where he executed the Gutenberg monument and other notable works. For the villa Torlonia in Rome he made several statues, and other works of his are at the Hague. II. Robert Eberhard, nephew of the preceding, born in Riga, Nov. 4, 1806, died in New York, Dec. 13, 1870. He studied under Thorwaldsen in Rome, settled in New York in 1828 as a sculptor of tombstones, and was the first instructor of Thomas Crawford. He executed the Battle monument at Frankfort, Ky.; Pulaski monument at Savannah, Ga.; the monument to Gen. George H. Thomas at Troy, N. Y.; and other similar works. He has been called the father of monumental art in America.

**LAURA.** See PETRARCH.

**LAUREL,** a name applied to a number of trees and shrubs, which in many cases are not related to one another. It should be restricted to the genus *laurus* or true laurel, which is the type of the *lauraceæ* or laurel family. This family includes a large number of mostly aromatic trees and shrubs, with alternate, dotted, simple leaves, and perfect or polygamous, apetalous flowers; the anthers have two or four cells, which open from below upward by small valves; the fruit is a one-seeded drupe or berry. The *lauraceæ* are especially natives of tropical regions, but several are found in North America. The genus *laurus* formerly included several hundred species, among them the trees producing cinnamon and camphor, as well as our native sassafras and spice bush; but later botanists have placed these and others in other genera of the same family, leaving only two species to represent the old genus. The true

or noble laurel, *L. nobilis*, is a native of the south of Europe, where it sometimes grows as high as 60 ft., still retaining a shrub-like character by throwing up stems from the base; it is a handsome evergreen, the dark shining leaves of which are wavy on the margin and pleasantly aromatic; the black berries, of the size of small cherries, are also aromatic. The tree is much cultivated in Europe, and is hardy in favorable situations in England and in the southern United States. Several garden varieties are known which differ from the type in the form and color of their leaves. The tree is also called the bay, from the French *baie*, derived from the Latin *bacca*; the term bay was formerly applied to berries generally, but is now restricted to those of the laurel. The custom of crowning successful poets with leaves of this tree gives origin to our expression poet laureate; wreaths of the laurel with the berries (*bacca*) on were formerly placed



Laurel (*Laurus nobilis*).

upon the heads of students who took their degrees, and were hence known as baccalaureates, a name still retained in the universities, and from which, through the French *bachelier*, our word bachelor is derived. In the days of Roman greatness the laurel was considered an emblem of victory and likewise of clemency, crowning the victor, and being borne in the hands of the returning soldiery. It is honorably mentioned by Chaucer as the crown of the knights of the round table. The laurel is of little use except as a decorative plant. The leaves and berries were formerly used in medicine as stimulants; in large quantities they are emetic. A solid oil is obtained from the berries by heat and pressure; it has the consistence of butter, a greenish color, and the odor of the berries; it is still found in commerce as the oil of bays, and has a limited use in veterinary medicine. The leaves, under the name of bay leaves, are used in cookery for flavoring; the better qualities

of figs always come packed with a few bay leaves placed at the top of each box, to repel an insect which is very destructive to the fruit. The only other species, the Canary laurel (*L. Canariensis*), has much larger leaves, but, being a sub-tropical plant, is rarely seen in cultivation.—The Portugal laurel of the European gardens is *prunus (cerasus) Lusitanica*, an evergreen species of cherry, similar in properties to the related cherry laurel. (See CHERRY LAUREL.) The Carolina laurel cherry is *prunus Caroliniana*, another evergreen species related to the cherry laurel, and like that having poisonous properties; its leaves, especially after wilting in the sun, destroy cattle. The Carolina laurel of the English gardens is known with us as the Carolina red bay; it was formerly *laurus Carolinensis*, but is now placed in the genus *Persea*. California or mountain laurel (*oreodaphne Californica*) is a fine tree, sometimes 70 or 100 ft., but usually much smaller; its leaves are pleasantly aromatic, and sometimes used as a spice; its dark-colored, handsomely veined wood is valued for cabinet work.—Among the plants popularly called laurel, but which do not belong to the laurel family, are *magnolia grandiflora*, called big laurel and laurel magnolia; *rhododendron maximum*, the great laurel; *epigaea repens*, the ground laurel or trailing arbutus (see ARBUTUS); and the kalmias (see KALMIA).

**LAUREL**, a S. E. county of Kentucky, drained by Rockcastle river and Laurel creek; area, 288 sq. m.; pop. in 1870, 6,016, of whom 144 were colored. The surface is undulating or hilly, and thickly timbered, and the soil is fertile. The Knoxville branch of the Louisville and Nashville railroad traverses the county. The chief productions in 1870 were 14,146 bushels of wheat, 136,259 of Indian corn, 45,043 of oats, 11,597 of potatoes, 13,600 lbs. of wool, 17,784 of tobacco, and 46,394 of butter. There were 1,351 horses, 1,537 milch cows, 2,526 other cattle, 7,617 sheep, and 7,625 swine. Capital, Loudon.

**LAURENS. I.** A N. W. county of South Carolina, bounded N. E. by Enoree river, and S. W. by the Saluda; area, 812 sq. m.; pop. in 1870, 22,536, of whom 12,632 were colored. The surface is moderately uneven, and the soil, watered by numerous small rivers, is rich and well cultivated. The prevailing geological formation is granite. The Laurens railroad terminates at the county seat. The chief productions in 1870 were 52,246 bushels of wheat, 277,364 of Indian corn, 35,192 of oats, 19,947 of sweet potatoes, 88,554 lbs. of butter, and 7,077 bales of cotton. There were 1,741 horses, 2,037 mules and asses, 3,071 milch cows, 3,924 other cattle, 5,658 sheep, and 10,581 swine; 20 flour mills, and 2 woollen factories. Capital, Laurensville. **II.** A central county of Georgia, traversed by the Oconee river; area, 780 sq. m.; pop. in 1870, 7,834, of whom 3,654 were colored. It abounds in soft limestone, and has an undulating surface, overgrown in

many places with forests. The soil is a fertile sandy loam, resting on a bed of clay. The chief productions in 1870 were 175,298 bushels of Indian corn, 18,229 of sweet potatoes, 22,728 lbs. of wool, and 4,305 bales of cotton. There were 1,037 horses, 586 mules and asses, 2,567 milch cows, 6,733 other cattle, 8,502 sheep, and 9,603 swine. Capital, Dublin.

**LAURENS. I.** Henry, an American statesman, born in Charleston, S. C., in 1724, died there, Dec. 8, 1792. His ancestors were French Huguenots who shared in the exile of the sect at the revocation of the edict of Nantes. He was educated in Charleston, was designed for mercantile life, and passed from school to a counting house in Charleston, from which he was transferred to another in London, in order that he might enjoy a larger field for commercial study and acquaintance. Returning to his native city, he began business for himself, which he pursued with a rare industry and intelligence. As rigid with others as himself, he trained all his agents and subordinates to orderly habits like his own; so that his counting room became a school of discipline, into which the youth was deemed fortunate who could find his way. Although tenacious of his interests as a business man, he was a sturdy opponent of the abuses of power. His contests with the crown judges were frequent, especially in respect to their arbitrary decisions in marine law and the courts of admiralty, and his pamphlets gave remarkable proof of legal ability. Retiring from business, he visited Europe in 1771, put his sons to school in England, made the tour of Great Britain, and spent some time on the continent. In 1774 he was one of 38 Americans, a large proportion of whom were South Carolinians, who signed a petition to dissuade parliament from passing the Boston port bill. Finding, however, that petition was unavailing, and that war was inevitable unless averted by submission, he hastened home to take his part in the patriotic cause, reaching Charleston near the close of 1774. He was made a member of the council of safety, and soon became its president. In 1776 he was elected a delegate to the continental congress from South Carolina, and became its president, which office he held till the close of 1778. He was a frequent correspondent and resolute supporter of Washington. In 1779 he was appointed minister plenipotentiary to Holland, to negotiate a commercial treaty, but was captured on his way thither by a British frigate. He threw his papers overboard, but they were recovered by the enemy. They afforded conclusive evidence of his mission, and also disclosed the fact that Holland had been in secret negotiation with the revolted colonies, which led to a declaration of war by Great Britain against Holland. He was taken to London, and, being known to have been president of the rebel congress, was in October, 1780, closely incarcerated in the tower. His imprisonment continued for nearly 15 months, during which he

was greatly enfeebled, and suffered also from frequent attacks of gout. He was solaced, however, by the kind attentions of many friends, among whom was Edmund Burke. The British government made frequent attempts on his patriotism, but in vain; all that they obtained from him was a petition for his enlargement, in which he stated that he had honestly striven to prevent the final rupture between the crown and the colonies. Though his health was broken when he was released, he received the commission of congress as one of its ministers for negotiating the peace. He proceeded to Paris, where on Nov. 30, 1782, with Franklin and Jay, he signed the preliminaries of the treaty. On his return to America he was welcomed with the highest consideration. Offices were tendered him, which the state of his health and of his private affairs compelled him to decline. By an injunction in his will, his body was burned according to detailed directions of his own, and the remains were collected and buried. He left numerous original and valuable papers, a portion of which have been published in the collections of the South Carolina historical society. **H. John**, an American soldier, son of the preceding, born in South Carolina about 1756, killed there, Aug. 27, 1782. He was educated in England, returned home at the opening of the revolutionary war, and joined the army in 1777. He became aide to Washington, and was frequently his secretary, writing many of his letters and despatches, and was his chief medium of communication with foreigners in the service. He distinguished himself at Brandywine, was wounded at Germantown and again at Coosawhatchie, and was of great service to Moultrie when besieged in Charleston. He was one of the first to mount the British lines at the attack on Savannah, and was prominent in the defence of Charleston when it was besieged by Sir Henry Clinton. After the fall of the latter city he rejoined Washington, and was designated by him as the special representative of the army to proceed to France and appeal to the king for succor. He set out in the autumn of 1781, succeeded in his mission, and returned to his military duties. At the siege of Yorktown he led the forlorn hope and captured one of the two redoubts which were stormed. When operations had ceased in the north he joined the army of the south under Greene, and by his activity checked every effort of the British garrison in Charleston, and confined them for many months to the walls of the city. He was killed in a skirmish on the Combahee river with a marauding party of British. Washington lamented with keen feeling the loss of Laurens, who had shared his confidence and had requited his preference with the most affectionate devotion. Laurens once rushed between him and danger at Monmouth, and afterward shot in a duel Gen. Charles Lee for disrespectful language to his general. His correspondence, which was voluminous, exhibits an easy, grace-

ful, and vigorous style, marked equally by thought, information, and originality, and freedom of opinion. His army correspondence, with a memoir by W. G. Simms, was printed in 1867 for the Bradford club of New York.

**LAURENT, François**, a Belgian historian, born in Luxemburg, July 8, 1810. He studied at Louvain and Liège, where he graduated as a lawyer in 1832. He practised his profession in his native city till 1834, when he became connected with the ministry of justice in Brussels. In 1835 he accepted the professorship of civil law in the university of Ghent, and he was sustained by the government in this post notwithstanding his anti-ultramontane writings. His principal work, *Études sur l'histoire de l'humanité* (14 vols., Brussels and Paris, 1860-'68), is a collective edition of his publications on the various eras of history.

**LAURENTIAN MOUNTAINS**, a range of British North America, extending in its general direction from Labrador in a curve around the S. and W. shores of Hudson bay to the Arctic ocean, upward of 3,000 m. In its E. portion it forms the watershed separating the tributaries of the St. Lawrence river from those of Hudson bay. Beyond the basin of the St. Lawrence it is traversed by two affluents of the bay, Nelson and Churchill rivers; and still further N. it divides for 800 m. the tributaries of Mackenzie river from the streams flowing into Hudson bay. Its general elevation is from 1,500 to 1,600 ft., with some peaks about the Saguenay river of 4,000 ft. It is mostly well wooded with pine or spruce on the summits, and hard wood on the lower elevations and in the valleys. A remarkable feature of the range is the immense number of ponds and lakes, expansions of the streams, that dot its surface. The principal break in its general direction is on the Ottawa river, above Ottawa, where it crosses that stream, sweeps round S. to the Thousand islands near the exit of the St. Lawrence from Lake Ontario, then bends N. W. to the S. extremity of Georgian bay, and continues along the N. E. and N. shores of Lakes Huron and Superior, resuming its general course. The rocks of this range are sedimentary strata, which have become highly crystalline, and are the most ancient known on the American continent. The Canadian geologists have given to this formation the name of the Laurentian system.

**LAURENTIE, Pierre Sébastien**, a French historian, born at Houg, department of Gers, Jan. 21, 1793. He was a professor at Paris, for some time inspector general of studies, and for many years editor of the *Quotidienne* and other journals in the legitimist interest. Among his numerous works are: *De la légitimité et de l'usurpation* (1830); *Histoire de France* (8 vols., 1841-'3; with supplement, 1855); *Histoire de l'empire romain* (4 vols., 1861-'2); and several pamphlets in opposition to Renan (1862-'3).

**LAURENTUM**, an ancient city of Latium, between Ostia and Lavinium, 15 m. S. S. W. of



Rome, and contiguous to the coast. It is said to have been the capital of Latium and the residence of its king when Æneas and the Trojans arrived in Italy. After the establishment of the Roman empire it was incorporated with the neighboring municipality of Lavinium. Laurentum gave name to a territory extending from the mouth of the Tiber to near Ardea, which in imperial times was studied along the shore with the villas of the Roman aristocracy, including those of the younger Pliny and the emperor Commodus.

**LAURIUM** (Gr. *Λαύριον* or *Λαύρειον*), a promontory of Greece, in the southern portion of Attica. Famous silver, lead, zinc, and antimony deposits were discovered here in very remote antiquity, were successfully worked from the time of Themistocles to that of Pericles, and were supposed to have been exhausted in the time of Strabo, about the commencement of our era. In 1863 two agents of a commercial house of Marseilles explored the ancient mines and the adjacent country, purchased the land, and obtained from the government authority to reopen the mines and the right to the ores of argentiferous galena in their neighborhood. The great financial success of the mining operations induced the Greek government to raise claims against the Laurium company, which led to the diplomatic interference of the governments of France and Italy. In 1871 and 1872 the Laurium question completely absorbed public attention in Greece, even causing several ministerial changes. It was finally settled in 1873 by the sale of the mines to a Greek company, which came to an understanding with the government.

**LAURISTON, Jacques Alexandre Bernard Law**, marquis de, a French soldier, born in Pondicherry, India, Feb. 1, 1768, died in Paris, June 10, 1828. At the military school of Paris he was intimate with Bonaparte. In 1792-'3 he served in the armies of the north, of the Moselle, and of the Sambre and Meuse, and distinguished himself at the siege of Valenciennes. In 1796 he left the army; but he was recalled by Bonaparte when first consul, was appointed his aide-de-camp, and accompanied him to Italy. In 1801 he was sent on diplomatic business to Denmark, and in 1802, having been chosen to convey to London the news of the ratification of the treaty of Amiens, was there received with great enthusiasm by the people, who took the horses from his carriage and drew him to Downing street. In 1805 he was sent under Admiral Villeneuve on an expedition to Martinique, where he took Fort Diamond. Ten days later the fleet sailed for Europe, and after an engagement off Cape Ortegal was defeated by Nelson at Trafalgar, Oct. 21. Returning to France, he was placed at the head of a division of the army sent into Germany, and was made governor of Braunau. In 1806 he was commissioned to superintend the surrender of the magazines and arsenals of Venice in accordance with the treaty of Pres-

burg; and in the following year, by Napoleon's orders, he seized on the republic of Ragusa as a reprisal for the Russians having occupied the harbor of Cattaro. His defence of Ragusa against overwhelming odds was his most brilliant exploit. His allies the Turks having taken many Russian prisoners, Lauriston, in order to save their lives, ransomed them with his own money. In 1808 he accompanied Napoleon to Spain; in 1809 he was with Prince Eugène Beauharnais in Italy and Hungary, where he distinguished himself at the battle of Raab. The victory of Wagram was in great measure due to his bringing up 100 cannon in the face of a terrible fire. After the peace he negotiated the marriage of Napoleon with Maria Louisa, for which service he received the title of count and a mission to Russia, where he remained till 1812, when he joined the grand army. After the retreat from Moscow he organized at Magdeburg the 5th corps, occupied Leipsic during the battle of Lützen, turned the right wing of the enemy at the battle of Bautzen, and took Breslau, June 1, 1813. He was made prisoner at Leipsic, and did not recover his liberty till after the peace of Paris. He was treated with regard by Louis XVIII. When Napoleon returned, Lauriston accompanied the king to Béthune and then retired to his estate of Richecourt, where he remained during the hundred days. For this he was appointed peer of France and commander of the infantry of the guard. In 1817 he was created marquis, and in 1820 was called to direct the administration of the royal household. In May, 1821, he was made a marshal of France, and after the campaign in Spain in 1823 was in command of the 2d corps of the reserve. While visiting a celebrated opera dancer, he was struck with apoplexy, and died the next day.—His widow died early in 1873, at the age of 100 years and three months. His eldest son, **AUGUSTE JEAN ALEXANDRE LAW**, marquis de, born at La Fère, Oct. 10, 1790, served in the army, and from 1849 to 1851 in the legislative assembly. He was for a short time under arrest in December, 1851, afterward retired from public life, and died in July, 1860.

**LAUSANNE**, a city of Switzerland, capital of the canton of Vaud, situated near the N. shore of the lake and 31 m. N. E. of the city of Geneva, and about  $\frac{1}{2}$  m. from Ouchy, its port on the lake; pop. in 1870, 26,520. It is built on three steep hills, which project from Mont Jorat, the highest of which is crowned by the old cathedral, 500 ft. above the lake. The gymnasium, which was founded in 1537, was in 1806 converted into an academy, which has three faculties. There is also a theological faculty belonging to the synod of the Free church, a cantonal school, a normal school, an institution for the blind, an insane asylum, a cantonal museum, a cantonal library with more than 90,000 volumes, and several learned societies. The cathedral, a noble Gothic structure completed in the 13th century, is adorned with a lofty tower

and a spire, and contains the remains of St. Bernard de Menthon. The church of St. François is also a very old building, and is memorable for the council assembled within its walls in 1449, in which Felix V. resigned his claims to the popedom. The other remarkable build-

ings are: the old episcopal palace, now the government house, the penitentiary, the charity schools, and the casino or club house. The streets are steep, narrow, and ill paved. The manufactures comprise woollen cloth, paper, leather, and jewelry, and some trade is carried



Lausanne.

on in wine, which is the staple of the canton. Steamboats ply on the lake between Ouchy, Geneva, and other towns; and there are railways to Yverdon, Geneva, Bern, and Vevay. Among the objects of interest are the house in which Gibbon wrote the greatest part of his "Decline and Fall," and the grave of John Philip Kemble, the tragedian, in the cemetery of St. Pierre de Plain near the city. A Celtic burial ground has been discovered about 6 m. N. W. of the city, near Cheseaux.—Lausanne became the see of a bishop in the 6th century; but in 1536 the bishop transferred his seat to Fribourg, as Lausanne had joined the Reformed church. Since then Fribourg has been the residence of the bishop of the diocese, which retained the title of Lausanne till 1819, when it was called Lausanne and Geneva, as the Catholic parishes of the canton of Geneva were united with it. In 1873 the bishop resumed the former title of bishop of Lausanne, as the pope had erected the canton of Geneva into an independent vicariate apostolic. The federal council of Switzerland regarded the change of the title and the territory of one of the Swiss dioceses as an encroachment upon the rights of the confederation, and refused to recognize it. (See SWITZERLAND.)

**LAUZUN, Antonin Nompard de Caumont**, duke de, a French courtier, born about 1633, died Nov. 19, 1723. A poor nobleman from Gascony, he made his fortune at the French court by his elegant manners and wit and dauntless ambi-

tion, and became a favorite of many of the most eminent and beautiful women, and of Louis XIV., who appointed him to various offices. He was about to marry Mlle. de Montpensier, granddaughter of Henry IV., and to take the command of the French army in Flanders, when the intrigues of Louvois and Mme. de Montespan caused him to be detained in prison for many years. He finally recovered his liberty at the instance of the French princess, whom he is supposed to have secretly married. In 1688 he escorted the queen of James II. and her infant son to France, and in 1689 took an active part in the fruitless expedition to Ireland. Although he never fully recovered the good graces of the French monarch, he was raised to the rank of duke in 1692. Mlle. de Montpensier died in 1693, and in 1695, at the age of about 62, he married Mlle. de Durford, a girl of 16. Lauzun figures frequently in the French literature of the 17th century, and even of a later period, particularly in the works of Mme. de Sévigné, La Bruyère, and Saint Simon.—The *Mémoires du duc de Lauzun*, of which various editions have appeared, and a new one by Lacour in Paris in 1858, do not refer to this Lauzun, but to a noted member of the Biron family. (See BIRON, ARMAND LOUIS.)

**LAVA.** See VOLCANO.

**LAVACA**, a S. E. county of Texas, watered by Lavaca and Navidad rivers; area, 926 sq. m.; pop. in 1870, 9,168, of whom 2,707 were col-

ored. It has an undulating surface, partly covered with ash and post-oak timber, and a fertile soil adapted to cotton, sugar, and Indian corn. The chief productions in 1870 were 261,815 bushels of Indian corn, 47,287 of sweet potatoes, 19,508 lbs. of wool, and 3,528 bales of cotton. There were 5,970 horses, 1,058 mules and asses, 21,012 milch cows, 2,553 working oxen, 56,309 other cattle, 10,890 sheep, and 20,494 swine. Capital, Hallettsville.

**LAVAL**, a fortified town of France, capital of the department of Mayenne, on the Mayenne river, 41 m. E. S. E. of Rennes; pop. in 1866, 27,189. There is a considerable trade in wine, brandy, wood, iron, clover, and marble. It has four parish churches of the first grade, a theological seminary, a college, a convent of Trappists, two castles, three hospitals, a public library, iron works, and a considerable linen industry. In 1855 it was erected by Pius IX. into an episcopal see. It was in the environs of Laval that originated in 1791 the royalist insurrection called the Chouannerie. Laval was taken by the Vendean army, and a brilliant victory gained near it over the republicans, in October, 1793.

**LAVAL**, a county of Quebec, Canada, embracing Isle Jesus, which lies at the mouth of the Ottawa river, and is separated from the island of Montreal on the south by the rivière des Prairies; area, 85 sq. m.; pop. in 1871, 9,472, of whom 9,325 were of French origin or descent. Capital, Ste. Rose.

**LA VALETTE**, Antoine Marie Chamans, count de, a French officer, born in Paris in 1769, died there, Feb. 15, 1830. At the breaking out of the revolution he became an officer of the national guard, and he was one of the last defenders of the king on Aug. 10, 1792. Entering the republican army, he distinguished himself on the Rhine and in La Vendée, and gained the confidence of Bonaparte, who appointed him his adjutant and private secretary. He accompanied him to Egypt, and became more nearly allied to him by marrying a niece of Josephine. After the 18th Brumaire he was made postmaster general and count. In 1814 he lost his office, but he reoccupied his post immediately on the departure of Louis XVIII. for Ghent. After the restoration of Louis XVIII. he was arrested for having aided the emperor, and condemned to death. He escaped by the aid of his wife and daughter and three English gentlemen, and went to Munich, where he was kindly received by the king. Mme. de La Valette, after the escape was discovered, was kept for some time imprisoned, and became insane; but she survived until June, 1855. In 1822 La Valette was pardoned and returned to France, where he lived in obscurity. He left a volume of *Mémoires et souvenirs* (Paris, 1831), containing an interesting account of his escape. Napoleon I. bequeathed 300,000 francs to La Valette, of which he received 60,000; in 1855 Napoleon III. paid the remainder to his heirs.

**LA VALETTE**, Jean Parisot de. See VALETTE.

**LA VALLIÈRE**, Françoise Louise de La Baume Le Blanc, duchess de, mistress of Louis XIV., born in Tours in August, 1644, died in Paris, June 6, 1710. After the death of her father, a nobleman and superior officer, her mother married the baron de Saint-Rémy, who was attached to the household of the duchess of Orleans. Introduced at court and appointed maid of honor to Henrietta of England, sister-in-law of Louis XIV., Mlle. de La Vallière soon received the homage of several distinguished persons, whose attentions she discountenanced from a feeling of sincere love and admiration for the king. All who became acquainted with the young lady were struck with her modesty, gentleness, and truthfulness, as well as with her personal charms and varied accomplishments; and the most eminent French writers, as Racine, La Fontaine, and Mme. de Sévigné, bestow the highest encomiums upon her virtues and graces. Her love for Louis XIV. was as enthusiastic as it was disinterested; and after having for some time resisted his advances, she became his mistress in 1661, but on several occasions felt impelled by conscientious scruples to desert her lover, who twice succeeded in bringing her back from the convent in which she had taken refuge. In 1674, however, she left him definitely, and took the veil in the Carmelite convent of the faubourg St. Jacques under the name of Sister Louise. She received the visits of the queen, the duchess of Orleans, and other warm admirers, and, engaged in works of piety and charity, spent the rest of her life in the seclusion of that convent, of which Mme. de Montespan, who had succeeded her as mistress of the king, also eventually became an inmate. She bore four children to the king, two of whom were legitimated, viz., Mlle. de Blois, who married the prince of Conti, and the count of Vermandois. She wrote a work entitled *Réflexions sur la miséricorde de Dieu, par une dame pénitente* (1680), of which a copy, dated 1688, with corrections by Bossuet, was discovered in the Louvre library by M. Damas-Hinard in 1852. The original as well as the corrected work was edited by M. Romaine Cornut (Paris, 1854). A collection of her letters was published in 1767. Among the works based upon her life, the novel of Mme. de Genlis has attained the greatest popularity. Lebrun's "Magdalen" in the Val-de-Grâce in Paris has been said to represent the features of the duchess, but this is now very generally disbelieved. See Arsène Houssaye, *Mlle. de La Vallière et Mme. de Montespan* (Paris, 1860).—Her grand-nephew, LOUIS CÉSAR DE LA VALLIÈRE (1708-'80), was a celebrated bibliophile.

**LAVAL-MONTMORENCY**, François Xavier de, the first Roman Catholic bishop of Quebec, born in Laval, France, March 23, 1622, died in Quebec, May 26, 1708. He was ordained priest in Paris, Sept. 23, 1645, was nominated missionary bishop of Cochin China in 1651, but did not

accept the office, and became archdeacon of Évreux in 1653. He was chiefly known as the abbé de Montigny, one of his family titles. In 1658 he was appointed vicar apostolic of New France, and bishop of Peträa *in partibus*, in opposition to the archbishop of Rouen, who claimed exclusive jurisdiction in Canada. He was consecrated privately, arrived in Quebec June 16, 1659, displayed equal firmness and moderation in overcoming the pretensions of the vicar general of the archbishop of Rouen, and returned to France in 1662 in order to obtain missionaries, nuns, and pecuniary aid for his flock. He founded while there the seminary of Quebec, March 26, 1663, connecting it by name with the seminary of foreign missions in Paris; the deed of foundation was confirmed by letters patent of Louis XIV. in April, 1664. In the following September he arrived in Quebec, and on July 11, 1666, consecrated the church of Notre Dame. Besides his efficient measures for the organization of a parochial clergy, he enacted the most stringent regulations against the sale of intoxicating liquors to the Indians. This brought him into conflict with the colonial authorities, but he triumphed over all opposition. During a second stay in France, in October, 1674, he obtained his appointment as titular bishop of Quebec. This office enabled him to protect the Indians from the injurious intercourse with the whites, and to define the mutual relations of the regular and secular clergy. Having secured sufficient revenues for the support of the seminary and his episcopal establishment, he made a third voyage to France, obtained the nomination of a coadjutor bishop, into whose hands he resigned the administration of his see in January, 1688, and came back to Quebec to reside in the seminary, without taking further part in public affairs. To the seminary he made over his entire estate, and saw it twice burned to the ground. He was distinguished by unblemished purity of life, ardent zeal for religion, and a firmness which bore down all opposition. The Laval university in Quebec is named after him. His life was written by Louis Bertrand de la Tour (Cologne, 1751), and by an anonymous author (Quebec, 1845).

**LAVAL UNIVERSITY.** See QUEBEC.

**LAVATER, Johann Kaspar,** a Swiss mystic and physiognomist, born in Zürich, Nov. 15, 1741, died there, Jan. 2, 1801. He was the son of a physician, a timid, sensitive, imaginative boy, with an aversion to school, but fond of poetry, solitude, and religious reverie. Intended for holy orders, he pursued his studies at Zürich, but was more interested in Klopstock and Rousseau than in controversialists, and sought the revival of piety rather by humble labors as member of an ascetic society than by weighing theological formulas. "Limit yourself at every moment, if you can, to what is nearest to you," was one of his early ethical precepts. Notwithstanding his shrinking nature, his first public act was a vehement pamphlet (1762) as-

sailing an oppressive but influential officer of Zürich, which made it advisable for him to leave his native town for a time. He went to Berlin, then, under Frederick the Great, the centre of intellectual culture in Germany, and continued his studies there, enjoying the friendship of Sulzer and Mendelssohn, and in Barth, Pomerania, under the theologian Spalding. Returning to Zürich in 1764, he entered on the duties of pastor, and the peculiar charm of his mystical discourses, his benevolent character, and blameless life made him warmly and universally beloved. His published sermons and his correspondence soon extended over Europe. In 1767 appeared his *Schweizerlieder*, containing his finest poems, which was followed by his *Aussichten in die Ewigkeit* (3 vols., 1768-'73), the first of a series of works in which he maintained the perpetuity of miracles, the irresistibility of prayer, and the necessity for every person to conceive of God as manifested in Christ crucified in order to be really alive himself. The last doctrine was called his Christomania. He determined to oppose his illumism to the philosophy that was reigning at Paris and Berlin; and having found in the *Palingenésie philosophique* of Bonnet what he deemed a triumphant exposition of Christian faith, he sent a translation of it with remarks of his own to his friend Mendelssohn, the mildest and ablest living advocate of deism, and summoned him either to refute it or to become a Christian. The controversy which ensued excited the greatest interest. Mendelssohn maintained that according to the system of Bonnet it would be as easy to demonstrate the divine origin of Islamism or Buddhism as of Christianity; and Lavater, fearing that his imperious challenge had been intolerant and unkind, withdrew it in a long letter. From that time he was the chief and almost the idol of the mystics. He explained the performances of Gessner and Mesmer by the theory of the Rosicrucians, visited and disputed with Cagliostro under a conviction that he was an envoy of Satan, and was suspected by his contemporaries of almost all heresies, of being an atheist, and of being secretly a high officer in the order of Jesuits. His celebrity was extended into foreign countries chiefly by his *Physiognomische Fragmente zur Beförderung der Menschenkenntnis und Menschenliebe* (Leipsic, 1775-'8), the first elaborate attempt to reduce physiognomy to a science, illustrated with numerous engravings and vignettes, and superior in respect of paper and typography to any book previously issued from the German press. It was the fruit of singularly acute observations from an early period of life, confirmed by the study of a large collection of likenesses of distinguished personages which are introduced into the work. Though he was sometimes deceived, the remarkable skill of Lavater in detecting character by some slight feature was often proved. The new science was widely studied, occasioned

many discussions, and was assailed with ridicule by Lichtenberg at Göttingen, by Nicolai at Berlin, and by Zimmermann in a parody on the physiognomy of tails. The author was visited at Zürich by numerous curious and eminent persons, whose characters he usually judged with sagacity; at a glance he recognized Necker, Mirabeau, and Mercier. He made a long and philosophically impartial commentary on his own physiognomy as displayed in several silhouettes: "A most delicate organization, forming a singular *ensemble*, many of whose parts are in contrast. He delights in high metaphysical speculations, and his intelligence cannot grasp the simplest mechanism. His imagination is extravagant, disordered, immensely eccentric; but it is checked by two severe guardians, good sense and a good heart. He knows much, but is the least erudite of all professional savants. None of his knowledge has been acquired; everything has been in some sort given to him. He loves, and has never been in love." The last years of his life were connected with the efforts of the Swiss for freedom. He had hailed the French revolution with an enthusiasm which was quickly changed to horror. His declamations in the pulpit against the French party caused him to be banished to Basel in 1796. He was soon permitted to return, renewed his pastoral offices, and opposed the oppressive measures of the French directory, till, when Masséna took Zürich (Sept. 26, 1799), he was shot in the streets while encouraging the soldiers and relieving the wounded. The shot is said to have proceeded not from a French but a Swiss soldier, who thus gratified a personal and partisan spite; and though Lavater recognized him he did not divulge his name, but wrote verses of forgiveness. He languished from the wound with severe suffering for more than a year. The original and peculiar character of Lavater was admired by Goethe, who pronounced him "the best, greatest, wisest, sincerest of all mortal and immortal men that I know." Their friendship was however interrupted in consequence of Lavater's portraiture of the non-Christian in his "Pontius Pilate."—A selection from his voluminous works was edited by Orelli (8 vols., Zürich, 1841-'4). His biography was written by Gessner (1802-'3). His work on physiognomy has been issued in various forms in the principal languages of Europe. The best English translation is by Henry Hunter, D. D. (5 vols., London, 1789-'98), the engravings for which were under the superintendence of Fuseli, who also translated his "Aphorisms on Man" (London, 1788). Other translations are by Thomas Holcroft (3 vols., London, 1789-'93; 10th ed., 1 vol., 1858), Morton (3 vols., 1793), and Moore (4 vols., 1797).

**LAVAUUR**, a town of Languedoc, France, in the department of Tarn, on the Agout, 21 m. N. E. of Toulouse; pop. in 1866, 7,376. It has a college, a public library, and a flourishing silk industry. Near it are coal mines. It was the

strongest fortress of the Albigenses, and was in 1211 taken by Simon de Montfort. From 1317 to 1801 it was the seat of a bishop.

**LAVENDER** (*lavandula*, Linn.), a genus of hoary, narrow-leaved, fragrant, sub-shrubby or perennial-herbaceous plants, of the natural order *labiate*, indigenous to the south of Europe, the Canaries, N. Africa, &c. Both the common and botanical names are derived from the latin *lavare*, to wash, either on account of the use made of the distilled water in bathing, or because the flowers were used to scent newly washed linen, whence the expression to be "laid up in lavender." There are several species, but two only which are economically employed. The common lavender (*L. vera*, Linn.) has been long known in gardens, and in deep, dry, warm soil it forms a compact hemispherical bush, flowering abundantly every year. Its flowers are lilac or purple, though a white-flowered variety is known. In the climate of



Common Lavender.

New York it is scarcely hardy, but in the vicinity of Philadelphia considerable quantities are grown for market. The dried flowers are used to make *sachets* or scent-bags for perfuming drawers, and the fresh flowers distilled with alcohol furnish the official spirits of lavender. By distillation with water they yield the fragrant oil of lavender, extensively used in perfumery. The lavender is easily propagated from cuttings, which often send up flower stalks the same season. The second kind, sometimes called French lavender, and sometimes spike or broad-leaved lavender, is *L. spica*. Its oil, called oil of spike, is employed by painters on porcelain and in the preparation of varnishes for artists. The plant has the habit of the common lavender, but more humble and the aspect more hoary, the spikes more dense and shorter; it yields by distillation twice as much essential oil as the preceding. The sweet basil is frequently called lavender in



our gardens; it belongs to the same natural order, but to a different genus. (See *BASIL.*)—Lavender is considered an aromatic stimulant, but is seldom used in medicine alone. The compound spirit of lavender is prepared with oil of lavender, oil of rosemary, cinnamon, cloves, nutmegs, and red saunders, with alcohol and water. This is frequently employed as an adjuvant to other drugs, or as a remedy for gastric disturbance or faintness. From 30 drops to a teaspoonful may be given with sweetened water or on a lump of sugar. In cases of inflammation of the stomach it should be cautiously administered.

**LAVERDIÈRE, Charles H.**, a Canadian historian, born at Château-Richer, Oct. 23, 1826, died in Quebec, March 27, 1873. He was ordained priest in August, 1851, and soon became a teacher in the seminary of Quebec. When the university of Laval was created, the abbé Laverdière was appointed its librarian. While a student he had established, and for several years directed, *L'Abeille*, a college journal, to which he contributed many historical articles. He was distinguished as a local antiquary. He aided in the publication of the "Jesuit Relations" (3 vols., Quebec, 1858); edited and completed the second volume of Ferland's *Cours d'histoire*, after the death of the author; in conjunction with the abbé Casgrain, he collected all the voyages of Champlain, and issued an edition (5 vols. 4to, Quebec, 1870), with extremely valuable notes and a biography of Champlain, and also the *Journal des Jésuites* (4to, 1871), a diary kept for several years by the superior of the Jesuits in Canada, of great historical importance. He also wrote *Histoire du Canada à l'usage des maisons d'éducation*, which was most favorably received; an account of *Notre Dame de Recouvrance à Québec*; and *À la mémoire du R. P. Ennemond Massé, S. J.*, one of the earliest Jesuit missionaries, whose grave at Sillery he discovered and marked by a fine monument. He also edited several works on church music, in which he was a proficient.

**LA VILLEMARQUÉ, Théodore Claude Henri Hersart de**, viscount, a French philologist, born at Quimperlé, Brittany, July 6, 1815. He has published *Barzas-Breiz* (2 vols., 1839; enlarged ed., 2 vols., 1846), containing popular Breton songs with a French text; *Contes populaires des anciens Bretons* (2 vols., 1842); and other works relating to the language and literature of the ancient Bretons, including an edition of Le Gonidec's French-Breton dictionary (2 vols., St. Brienc, 1857). Tom Taylor has translated some of his Breton songs and ballads into English (London, 1865). A new edition of his *La légende celtique en Irlande, en Cambrie et en Bretagne, suivie de textes rares ou inédits*, appeared in Paris in 1864; and in 1865 *Le grand mystère de Jésus*, a mediæval Breton drama, with an essay on the ancient Celtic stage.

**LAVINIUM**, an ancient city of Italy, in Latium, situated near the sea, between Laurentum and

Ardea, about 17 m. S. of Rome. It is said to have been founded by Æneas, shortly after his arrival in Italy, and named by him after his wife Lavinia. He made it the capital of Latium, but it was never in historic times of much political importance; and Strabo speaks of it as presenting the mere vestiges of a city, though still retaining a sacred character. It was customary for the Roman consuls and prætors, when entering on their office, to offer sacrifices here to Vesta and the Penates.

**LAVOISIER, Antoine Laurent**, a French chemist, born in Paris in August, 1743, died on the scaffold, May 8, 1794. He was the son of a rich merchant, studied at the Mazarin college, and learned astronomy from La Caille, chemistry from Rouelle, and botany from Bernard de Jussieu. In 1766 he won a prize from the academy of sciences by his *Mémoire sur la meilleure manière d'éclairer les rues d'une grande ville*. Several other essays, especially his *Mémoire sur les couches des montagnes*, secured him admission to that academy in 1768. To meet the heavy expenditures necessitated by his experiments, he sought and received an appointment as farmer of the public revenue; and he showed himself a skilful administrator no less than an acute philosopher. In 1776 Turgot placed him at the head of the *régie des salpêtres*, and he introduced many improvements into the manufacture of gunpowder. From 1778 to 1785 he gave attention to agriculture, and enriched the science of husbandry by many valuable suggestions. In 1787 he was elected to the provincial assembly of Orleans. In 1788 he became one of the trustees of the bank of discount, and in 1789, as assistant deputy to the constituent assembly, presented an interesting report upon the condition of that institution. He was a member of the commission on weights and measures in 1790, and took great interest in the preparation of the new decimal system. Being in 1791 one of the commissioners of the treasury, he published his essay *De la richesse nationale de la France*, in which he presented a plan for the collection of taxes; this essay, which was to be but the forerunner of a complete treatise upon this important subject, entitles him to a high rank among political economists. But the best of his energies had been devoted to chemical investigations, which he pursued with untiring perseverance from 1772 till his death; in 1786 he had published no fewer than 40 essays or memoirs, giving incontrovertible evidence of great logical power and unparalleled acuteness, while successively embodying the principles out of which chemical science was to be renovated. His discoveries and general influence in this branch of natural philosophy are treated in the article *CHEMISTRY*. His greatest work is his *Traité élémentaire de chimie* (2 vols. 8vo, 1789), a synopsis of modern chemistry, in which he exhibits no less ability as a logician than as a natural philosopher. His physical investigations were also valuable; he

wrote an excellent essay *Du principe constitutif de la chaleur*, first printed in the *Mémoires de l'académie des sciences* in 1777. In his later years his attention was mostly turned to applications of chemistry to physiology, and his two *Mémoires sur la transpiration des animaux* deserve to be particularly noticed. He was collecting all his writings with the ultimate view of remodelling them into a single work, when the course of revolutionary events brought him to a premature end. Dupin, a member of the convention, having on May 2, 1794, introduced an act of accusation against all the farmers of the public revenue, Lavoisier delivered himself up and was imprisoned; on the 6th he was involved in the general sentence of death against the corporation to which he belonged, and two days later he was guillotined. His essays were collected and published by his widow (who afterward married Count Rumford), under the title of *Mémoires de physique et de chimie*, in 2 vols. 8vo. A complete edition of his works has been published under the supervision of the minister of instruction, and at the expense of the government (4 vols., Paris, 1864-'8).

**LAW** (A. S. *legu, lag, lah*, from *leggan*, to lay), in a general sense, a rule of action; in a more restricted one, a rule of human conduct, or collectively a body of regulations adapted to a particular subject. In the civil code of Louisiana it is defined as a "solemn expression of the legislative will." Law, regarded as a body of rules for the direction of the individual in his relations with society, is treated in the articles CIVIL LAW, CODE, COMMON LAW, CRIMINAL LAW, LAW MERCHANT, and MARTIAL LAW; as regards matters of ecclesiastical jurisdiction, in the article CANON LAW; and as regards the mutual rights and relations of states, in the article LAW OF NATIONS.

**LAW, Edward, Lord Ellenborough.** See ELLENBOROUGH.

**LAW, John, of Lauriston,** a British financier, born in Edinburgh in April, 1671, died in Venice, May 21, 1729. He received an excellent education, and manifested at an early age a talent for finance, but became notorious as a gambler and roué. Having killed an antagonist in a duel, he fled to France. Thence he went to Holland, where he made a special study of banking in the great bank of Amsterdam. In 1700 he returned to Scotland, and published a work advocating the establishment of a bank which should hold all the sources of revenue of the state in its own hands, and, treating them as capital, issue notes, and at the same time make a profit by discounting. The proposition was declined by government, and Law went with his scheme to Paris, where it also failed to meet approbation. He was afterward expelled from Paris and other continental cities, but not before he had obtained admission to court circles, and gained large sums by gambling. On the death of Louis XIV., and the accession of the duke of Orleans to the

regency, Law reëntered Paris with a fortune of more than \$500,000 made by gambling. The financial affairs of the French kingdom being at this time in the utmost embarrassment, he soon gained a hearing, and, having secured the patronage of the regent, in 1716 established a bank under royal authority. This institution was authorized to discount bills of exchange, and to issue notes redeemable in specie of fineness equal to that of the current money of the realm. As it accepted at par government bills, on which there was a discount of nearly 80 per cent., and as there was a general want of private credit, its stock was soon taken, and a very lucrative business established. Law, however, aimed higher than this. He believed that, while there was no standard of prices or of money, credit was everything, and that a state might with safety treat even possible future profits as the basis of a paper currency. With this view he established the Mississippi or West India company, based on the scheme of colonizing and drawing profit from the French possessions in North America. This company, enlarging its scope, soon absorbed the French East India company under the general title of the "Company of the Indies." It extended its capital to 624,000 shares of 550 livres each, and engaged itself to lend the king 1,600,000,000 livres at 3 per cent. An extraordinary fever of stock gambling had been gradually excited by these financial efforts, and the result was that the shares of the company rose to 35 or 40 times their original value. Great extravagance resulted. Land near Paris rose to the value of 100 years' purchase, and most objects of commerce in the same proportion. Law was now made comptroller general of the finances, and his power was almost absolute. But the constant decrease of specie in France, and the constant issue of government notes, which by May, 1720, had reached the sum of 1,925,000,000 livres, soon undermined the company. A crash came, the shares sank in value, and Law became a fugitive. It seems, however, to be well established that he was a sincere believer in his own scheme, and that he acted honestly, and with a desire to promote the public welfare. He laid by no money, and when he left France took with him only 800 louis d'or. He travelled for some time afterward in different European countries, and at the invitation of the British ministry finally returned to his native kingdom, being presented on his arrival to George I. by Sir John Norris. On Nov. 28 he pleaded at the bar of king's bench for the royal pardon for a murder, on which occasion he was attended by the duke of Argyll and the earl of Hay. He received from France a pension of 20,000 livres until the death of the regent, and entertained till then hopes of arranging his differences with the French company of the Indies, which claimed from him the sum of 20,236,375 livres. Little by little he sank into obscurity, and finally died in great poverty in Venice. His remains

were buried in the church of San Geminiano, whence in 1808 they were transferred to the church of San Moise by Marshal Lauriston, the grandson of his brother.—Works upon Law and his system are numerous, but it is only within the present century that justice has to any degree been done to the uncommon abilities of which he was really possessed. See Thiers, *Histoire de Law* (published in Paris in 1858, from the *Revue progressive* of 1826; English translation, New York, 1859); Kurtzel, *Geschichte der Law'schen Finanz-Operation* (in Raumer's *Historisches Taschenbuch*, 1846); and Charles Mackay, "Memoirs of Extraordinary Popular Delusions" (London, 1850).

**LAW, William**, an English mystic, born at King's Cliffe, Northamptonshire, in 1686, died there, April 9, 1761. He was admitted into Emmanuel college, Cambridge, in 1705, received the degrees of bachelor and master, and was elected to a fellowship in 1711, which he retained till 1716, when he forfeited it by refusing as a Jacobite to take the prescribed oath of allegiance to George I. He never again officiated in public, though livings were tendered him through his friend Dr. Sherlock, afterward bishop of London. In 1717 he engaged in London in the Bangorian controversy, publishing three letters to the bishop of Bangor which are among his most effective productions. In 1726 he wrote an answer to Mandeville's "Fable of the Bees," an admirable essay, which has been republished separately with an introduction by F. D. Maurice (Cambridge, 1844). He soon became tutor to the father of the historian Gibbon at Putney, accompanied his pupil to the university of Cambridge in 1727, and afterward remained in the family more than ten years. His treatise on "Christian Perfection" appeared in 1726, and was followed in 1729 by his "Serious Call to a Devout and Holy Life," his most popular work. Dr. Johnson mentions it as the first book which made him think in earnest of religion, and styles it the finest hortatory theology in any language. These writings caused him to be consulted as a spiritual adviser by many serious persons, and his piety and wisdom gave him great personal authority. Among those who were instructed by him were the brothers John and Charles Wesley; and a divine named Dr. Trapp in a published discourse, which was answered by Law, attributed the origin of Methodism and other religious movements of the time to his influence and writings. To a young lady who had expressed a desire to be of the Roman Catholic communion he addressed three remarkable letters (1731-'2; first published in 1779). He lived subsequently with Mrs. Hutcheson, and with Hester Gibbon, a sister of his pupil, at King's Cliffe, engaged in exercises of piety, and devoting their combined annual income of about £3,000 to purposes of charity. A school was endowed for the instruction and clothing of 40 boys and girls, which still continues under the name of

Law's and Hutcheson's charities. He published subsequently a few tracts, and a translation of Jacob Boehm (Behmen), which bears his name (4 vols., 1764-'81), but contains little by him besides illustrative mystical figures, having been prepared for the press by Mrs. Hutcheson and Miss Gibbon, and published at their expense. His collected works (9 vols., London, 1762) embrace 16 treatises and a collection of letters. His life was written by Richard Tighe (London, 1813). A volume entitled "Notes and Materials for an Adequate Biography of the celebrated Divine and Theosopher William Law" was printed for the Theosophian library in London in 1856.

**LAWES, Henry**, an English composer, born probably in Salisbury in 1600, died in 1662. About 1625 he became one of the gentlemen of the chapel to Charles I., and soon acquired a considerable reputation as a composer of music for masques and songs. His works are numerous and of unequal merit. Among the most successful was the music to Milton's "Comus," performed at Ludlow castle in 1634, the composer himself personating the "Attendant Spirit." Milton speaks of his strains as "sweetening every musk rose of the dale." Waller, many of whose songs Lawes set to music, Herrick, and Phillips also speak of him in their verses as the great English composer of the day. Lawes continued in the service of Charles until the death of the latter, and at the restoration he composed the anthem for the coronation of Charles II.

**LAW MERCHANT.** This ancient phrase has been defined as synonymous with the law of merchants. It is rather the system of law which the courts of England and the United States apply to mercantile contracts. It is a branch of the common law, inferior in importance to no other, and in many respects quite distinct from any other. The principal subjects embraced within it are the law of shipping, including that of marine insurance; the law of negotiable bills of exchange and promissory notes; and the law of sales; all of which topics are treated of in this work specifically.—The law merchant has grown up gradually, and during the larger part of its existence, slowly. It originated undoubtedly in the customs of merchants. That it stands out in English law more prominently and distinctly than in any other general system of municipal law, may be reasonably ascribed to the greater extent of the commerce of England for many ages. In the earliest records we have distinct intimations that questions in relation to the interests and contracts of merchants came not unfrequently before the courts; and that these questions were decided even then by a reference to the customs of merchants. In doing this the courts only obeyed a necessity, which was felt wherever commerce existed and was respected. It is not to be concealed, however, that the courts did this with some reluctance, and by steps which followed each other only at long

distances. The reasons for this are obvious, and may be discerned the more easily because they have not yet ceased wholly to operate. The common law was, at a very early period, a complicated but well arranged and exceedingly systematic body of law. To know this was the privilege of a few; to administer it gave wealth and dignity to a very few. The law was then a monopoly, and one of very great value, and it was guarded carefully by those who possessed it. But merchants were compelled to find, or to invent, for the various exigencies of their commerce, rules and principles different from those which had grown out of the feudal system, and were intended mainly to govern titles to land and the relations of feudal rank. When these mercantile contracts came before the courts, the same necessity which had led merchants to find and introduce their new rules, acted upon the courts, and induced the courts, more or less willingly, to accept these rules as their rules also, and thus to make them law. But while some of these rules were only modifications of the existing rules of the common law, others of them were very distinct exceptions, and some were positive contradictions. It was perhaps wise in the courts to regard with jealousy rules of law made by no sovereign authority, and neither evidenced nor promulgated in any authentic way; and indeed at all times the established rules which governed the business and the contracts of any set of men must have been recognized as law; and even the Roman civil law acknowledged the binding force of mercantile usage as constituting law. One instance (Digest, L. 14, tit. 2, sec. 9) will show this regard to usage. In the reign of the emperor Antoninus a vessel had been wrecked; a part of her cargo had been thrown over to lighten her, and by this loss the vessel and the remainder of the cargo were saved, and the owner of the property demanded a contribution from the others. Many centuries before this time the merchants and navigators of the Mediterranean had formed a code of laws for their own government, and as it was agreed upon at and promulgated from the island of Rhodes, then a principal centre of commerce, it was known as the Rhodian law. By this law, the claimant would be entitled to contribution under a principle which has come down to our own times, and is now in full force under the name of general average. The claim of the owner of the property lost was submitted to the emperor, and the rescript, or decree, was as follows: "I, indeed, am lord of the earth; but the law (or this law) is the lord of the sea. Whatever the Rhodian law prescribes in the premises, let that be adjudged." The very next rubric makes the ship owner responsible for the acts of the master of his ship. Another (Dig. 4, 9) provides that mariners and certain others shall be responsible for all property committed to their charge. Another (Dig. 22, 2; Code, 4, 83) gives rules which are quite the same with

those that regulate at this day loans on bottomry and respondentia. And another (Dig. 47, 9) provides that fourfold damages should be paid by the plunderer of a vessel in distress. These provisions of the Roman law, with the remains of the law of Rhodes, sufficed for the purposes of commerce until about eight centuries since, when the *Consolato del mare* was promulgated. It is an excellently constructed system, constantly referred to by law writers of continental Europe at this day, and in some instances mentioned by English and American judges. The origin of this code is not certainly known, nor the name of its authors, nor the time or place of its original promulgation. Next to the *Consolato* in time, according to the best authorities, came the "Laws of Oléron." We know that these were collected, reduced to systematic form, and published, as the rules then in force for the regulation of shipping, in the small island of Oléron, off the coast of France. Queen Eleanor was duchess of the province of Guenne, near which Oléron lies, and French writers assert that she caused the preparation and publication of this code. English antiquaries refer it to her son Richard I. But no one certainly knows who was their author, or when they were first in force. This code has been repeatedly published in English, and is most accessible to American students in the first volume of Peters's "Admiralty Reports." Then followed the "Laws of Wisby." This was the name of a convenient port on the W. coast of Gothland, an island in the Baltic, about equidistant from Sweden, Russia, and Germany, and once the emporium of a great commerce. These laws were probably founded upon the laws of Oléron, with which they frequently coincide. A French work called *Le guidon*, and often referred to under that name (the author being unknown), was published about three centuries since. Its whole title, translated into English, is: "A Useful and Necessary Guide to them who deal in Merchandise and send it to Sea." And then we reach the *Ordonnance de la marine* of Louis XIV., published in 1681. It covers the whole ground of maritime law, including insurance. It codifies and systematizes with great skill all existing provisions, whether they were derived from enactment or from usage, and in many instances improves upon them. Chancellor Kent calls this ordinance "a monument of the wisdom of his reign, far more durable and more glorious than all the military trophies won by the valor of his armies."—Passing now over to England, we find even in Magna Charta (1215) a section running thus: "All merchants shall have safe and secure conduct to go out of and to come into England and to stay there, and to pass as well by land as by water, to buy and sell by the ancient and allowed customs, without any heavy tolls, except in time of war, or when they shall be of any nation at war with us." And the next section defines the rights of alien merchants in time of war. In subsequent

reigns, and especially in those of the Edwards, various statutes were passed, expressly *de mercatoribus*, and in most instances securing to them valuable privileges. Such enactments were from time to time repeated, as they are to this day. And the struggle of the courts, and still more of members of the legal profession, to prevent this invasion of the law, is very remarkable. Thus a question early grew up whether "the custom of merchants" was to be regarded as a custom of certain places, differing in one of them from that which it was in others, or as a part of the general law of the realm. After some intimations in favor of the latter view, in 1622 (Winch's Reports, 24) Lord Chief Justice Hobart declared that "the custom of merchants is a part of the law of this realm;" and Coke, in both the 1st and 2d Institutes, declares that "the *lex mercatoria* is part of the laws of the realm." So this question seems to have been finally disposed of. Not so easy was it however to determine, finally and practically, another question which had also arisen. When it was determined that the custom of merchants had become the law merchant, and therefore must be applied to all mercantile contracts between parties who were merchants, it was now asked whether the same law should be applied to the construction and enforcement of the same contracts when they were made between parties who were not merchants. That the law merchant should be confined to persons who were merchants was at first held by the courts (Cro. Jac., 306, A. D. 1613), in a case where the drawee and acceptor of a bill of exchange was sued on his acceptance, and the defendant prevailed, on the grounds that only a merchant would be held on such acceptance, and that it did not appear that the defendant was a merchant at the time when he accepted the bill. In another case occurring 19 years afterward, the same doctrine was held. But in two years more the court had got so far that, the defendant being called a merchant, they held that they would intend that he was a merchant at the time; and 22 years afterward the court in a similar case decided the whole question by declaring that "the custom is good enough generally for any man without naming him merchant." From this doctrine the courts never afterward swerved, though the point continued to be repeatedly raised in argument, and it was not till 1765 that Lord Mansfield finally declared: "The law of merchants and the law of the land is the same. A witness cannot be admitted to prove the law of merchants. We must consider it as a point of law." The importance of this rule depends upon the difference in law between a custom which is so general that it has the force of law, and one which applies only to a contract made under it because it is to be considered as a part of that contract. This distinction is not merely technical, for it rests upon the most substantial foundations. If two men enter into a contract which relates

to some certain subject matter, and upon this an action of law begins which can be determined only by a construction of the contract, one of the parties may insist that it shall be construed in a certain way, because a custom exists in reference to that subject matter and that kind of contract, which gives it that meaning and effect. But, to make out this case, he must prove that this custom not only exists, but is so general, so old and well established, and so widely known and recognized, that a jury may believe as a matter of fact that the custom was in the minds of the parties at the time they made their contract, and that they made it in conformity with custom. Very many cases have been decided on this ground. Thus, in England, a party agreeing to leave in a warren 10,000 rabbits, was held bound to leave there 12,000, because it was proved to the satisfaction of the jury that, as to rabbits, and in that neighborhood, the words one thousand meant 1,200. (3 Barn. and Adol., 728.) So in New York, where one promised to pay 12 shillings per day for every man employed in a certain business, and some of the men worked 12½ hours within the 24, it was held that the employer must pay 15 shillings for such a day, because a custom was shown, applicable to that kind of work, of considering 10 hours in 24 a day's work. (5 Hill, 437.) But it is a very different thing when the question is whether a custom exists, so general as to be a part of the law of the land. Thus, a man promises, by his note in writing dated Jan. 1, to pay to some one \$1,000 in three months from date. The general law says that the money must be paid on the 1st of April. But a custom comes in, which has, after ages of general acknowledgment and practice, acquired the force of law, and this custom adds three days to the three months, and the money is not due until the 4th of April. And then another custom comes in, which by the same means has acquired the same force, and the effect of this is, that if the 4th of April falls on Sunday or any legal holiday, the money is due on the 3d. The practical difference between these two things is this. In the two cases cited of the rabbits and the days' work, whoever relied upon the custom was bound to prove conclusively to the jury its existence and recognition, as a matter of fact; and if it were so proved, the court would instruct the jury as to the legal effect of the fact thus proved. This legal effect would be only that these two persons would be bound by the construction put upon the words by the custom under which they used the words, in the same way in which they would be bound if they had expressly defined those words as having that meaning. But in the other case, no proof would be offered to the jury, nor would the court permit them to listen to any evidence about it. The only question would be, what is the law, not for this bargain only, or for these parties only, but for all parties and in reference to all similar



bargains? But it is the duty of the court to know the law, and it is their exclusive function to determine the law, and to declare it to the jury, whose duty it is, in civil cases certainly, to receive and obey the instructions given to them. But then it may be asked, how could this law merchant, which is by theory a mass or system of these customs, become known to the courts? None of these laws or rules were ever enacted, except, in some instances, after they had acquired the force of law, and it was thought desirable to give them more precision and uniformity. Of few of them is the origin known, either as to time, or parentage, or authority. How then came they to be law? The answer is not difficult if we keep in mind the distinction between a question of fact and a question of law. For the want of remembering this distinction, there is a seeming antagonism in the cases on this subject. Thus, in 1760 the court of king's bench said: "The custom of merchants is part of the law of England; . . . if there be a doubt about the custom, it may be fit and proper to take the opinions of merchants thereon." And in 1765 Lord Mansfield, chief justice, says: "A witness cannot be admitted to prove the law of merchants." But the contradiction between these two principles is apparent only, and both of them are unquestionably sound. Mansfield means that no witness can be admitted to prove to a jury what the law merchant is; it can no more be allowed than it would be to prove in this way the law of real estate or any other branch of law. But if the court are themselves uncertain as to what the law merchant is, they will hear evidence, authority, and argument upon the subject, and ascertain the existence or character of the customs which compose it, as well as they can. Lord Mansfield was in the constant habit of ascertaining from "the city," as the phrase was then, or from "the Trinity house" (a board consisting of eminent merchants), what their customs were; and it was by these means that he laid the foundations, to say no more, of some of the most important departments of the law merchant. And now both in England and the United States it is perfectly well understood that the courts will hear arguments and listen to citations of competent and pertinent authority upon any question of the law merchant, precisely as upon any other question of the law of the land. But when they decide that any rule enters into and forms a part of the law merchant, it has exactly the same force as any other rule of law.

**LAWN**, a word derived from the old English *lawnd* or *lawnd*, land, especially applied to untilled land left between woods, now used for any extent of grass land kept especially for ornamental purposes. When of small extent such land is often called a grass plot; but in gardening, any piece of ornamental grass, large or small, is a lawn. The thick-turfed, close-shaven, dark-green lawns which form so

important a feature in English scenery, are seldom seen in this country for two reasons: the intensity of our summer sun is such that the finer lawn grasses cannot withstand it, and those who lay out grounds have not learned the necessity for a thorough preparation of the land. A turf which is expected to last for an indefinite number of years is generally no better provided for than an annual crop. In making a lawn, expense should not be spared at the outset; the land must be drained if need be, and well and deeply worked, with a good supply of manure. The time for this work is in the autumn, and the sowing may be done then or in spring. In Europe a mixture of grass seeds, sometimes containing a dozen or more kinds, is sown, and the composition varied to suit different lands; each planter has his preferences as to the kinds and proportionate quantity of each, and uses grasses that are scarcely known here even by name. These mixtures have been frequently tried in this country, at a great expense, with the result of showing their unfitness for our climate. With us but three plants can be relied upon to form a good turf, viz.: June or Kentucky blue grass, redtop or bent, and white clover; timothy should always be avoided on account of its tendency to form tussocks or clumps, and orchard grass is still worse in this respect. Some use June grass or redtop alone, others mix either with white clover, and again both grasses are sown together with the addition of clover. A lawn mixture much used consists of Rhode Island bent 8 quarts, creeping bent 3 quarts, redtop 10 quarts, Kentucky blue grass 10 quarts, white clover 1 quart, making a bushel. The Rhode Island bent is a local variety of redtop, and the creeping bent is a closely related grass. Whichever seed or mixture of seeds is fixed upon, a sufficient quantity should be used; on very rich land three bushels to the acre may be enough, but upon ordinary soil at least five bushels are required. If the sowing is done late in the spring, it is customary to sow oats with the grass seed, in order that the growing oats may afford shade to the young grass; the oats should be cut at or before flowering time. The after care of the lawn consists in frequent mowing to cause the grass to spread, rolling to compact the earth about the roots, and the removal by hand of any coarse weeds that may appear. Annual weeds will soon succumb to the frequent mowing. The fertility of the soil must be maintained by annual top-dressings, in which stable manure, unless so well decomposed as to bring in no weed seeds, is to be avoided, but ashes, ground bones, and similar fertilizers employed. The lawn was formerly mown by a scythe, but this process is much simplified by the introduction of lawn mowing machines, moved by hand for small surfaces, and by horse power for large lawns. The present custom is to cut the grass frequently, and leave the clippings to serve as a

mulch to the grass, and ultimately to decay and enrich the soil. There can be no greater ornament to a place than a well kept lawn, and it should not be cut up by useless paths or numerous flower beds. Masses of flowers nowhere appear to such advantage as in a setting of turf, but these should be so judiciously introduced as not to break up the expanse of grass.—Several years ago it was proposed to use *spargula pilifera*, a relative of the common chickweed, as a substitute for grass in lawn making, but it had only a limited application. For covering soils so poor that grass will not grow upon them, the French horticulturists give high praise to a composite, which is said to afford a dense and lasting verdure, *pyrethrum Tehihatcheffi*, from Asia Minor.

**LAW OF NATIONS**, according to Mr. Wheaton, "may be defined as consisting of those rules of conduct which reason deduces, as consonant to justice, from the nature of the society existing among independent nations, with such modifications and deviations as may be established by general consent." International jurisprudence is a science of modern origin. In its present sense the law of nations was quite unknown to the two great states of antiquity. In Greece the amphictyonic council bore in some sort the character of an international tribunal, but it concerned itself chiefly with the internal affairs of the members of the league; the few relations which Greece maintained with foreign nations were defined by special compacts, and the general principles of right were rarely invoked in their adjustment. A nicer sense of international obligation was early evinced by the Roman state. The *collegium fetialium* is said to have been introduced among the religious orders of Rome by Numa Pompilius. It was the office of these *fetiales* not only to perform the ceremonies which attended a declaration of war, but also to arrange truces and to conclude peace. They performed the sacrificial rites with which alliances and treaties were solemnized, were intrusted as the representatives of the state with their enforcement, and guarded the security of foreign ambassadors at Rome. Indeed, Niebuhr expressly styles them "judges of international law." The rules of their procedure in these various functions constituted the *ius fetiale*; but though the order continued to exist until the time of the emperors, the *fecial* law had been in the insolence of conquest often disregarded, and with the world-wide extension of the empire it had necessarily fallen into disuse. The works of Cicero, Sallust, Livy, and other writers of the best age of Rome, do indeed contain allusions which imply a recognized law of nations; yet it is certain that the Roman law, as it existed at the dismemberment of the empire of the West, embodied no system of rules for governing the intercourse of states, or for deciding questions of right which might arise between them.—During the middle ages, the pope was often the judge and arbitrator in

the affairs of nations. His authority reached its height when Alexander VI. presumed to parcel out the new world to Spanish and Portuguese princes. The doctrines involved in the papal grant were supported by the jurists of Bologna, but their reasonableness was denied by a Dominican monk of the time, Francisus à Victoria, professor in the university of Salamanca, who published in 1557 a collection of dissertations entitled *Relectiones Theologicae*. Of these the 5th, *De Indis*, contested the validity of the papal pretensions; and the 6th, *De Jure Belli*, discussed exclusively the law of war. These essays are perhaps the earliest works written in the spirit of the modern international jurisprudence. Grotius mentions them in his *Prolegomena*, but includes them among the productions which, "whether composed by theologians or doctors of law, had, in the discussion of the laws of war, alike mingled and confounded natural law, the divine law, the civil and the canon law, and the law of nations." In 1581 Balthasar Ayala composed a treatise *De Jure et Officiis Bellicis*, which Hallam considers the first systematic one upon the practice of nations in the conduct of war. The honor of being the founder of the science of the law of nations has also been claimed for Albericus Gentilis, a native of Ancona. Gentilis became professor of civil law at Oxford, and attained high rank as a civilian by his works upon the Roman jurisprudence. As advocate of the Spanish embassy in the prize court at London, his attention was directed to questions of international rights; his most remarkable work upon topics of this nature was an essay upon the law of war.—In 1625 appeared at Paris the celebrated treatise *De Jure Belli et Pacis*, by Hugo Grotius. "Grotius was," says Sir James Mackintosh, "without dispute, the first to give a new form to the law of nations, or rather to create a science of which only rude sketches and undigested materials were scattered over the writings of those who had gone before him." Hallam says that the publication of the book marks an epoch in the philosophical, and it may be said in the political history of Europe. It was very early translated into various European languages, and great jurists made it the subject of elaborate commentaries. In 1656 it was made the text of lectures on public law in the university of Tübingen, and in 1661 a professorship was created in Heidelberg for expounding the law of nature and of nations from the writings of its author. The treatise *De Jure Belli et Pacis* is not limited to the law of war and of peace; it embraces also a view of the general principles which should govern the intercourse of nations. In the Roman law, the phrase *ius gentium* was not always used in an exact and specific sense, but it generally signified what modern writers have called the natural law, viz., the principles of right which are dictated by reason, and are common to all men alike. The *ius gentium* might assume the form of posi-

tive enactments, and then it formed an element of the *jus civile*, or municipal law of the state; or, if regarded as the basis and rule of the dealings of states with each other, it signified what is now called international law, or *jus inter gentes*. It was the object of Grotius to show that nations are governed by a law distinct from the natural law, to wit, by a code or body of rules founded indeed in the law of nature, but proceeding immediately from universal consent. "Those right deductions," he says, "which proceed from the principles of reason point to the law of nature, while those which proceed from common consent proceed from the law of nations." Pufendorf, who was invested with the professorship of public law at Heidelberg, rejected the distinction which Grotius had drawn between the law of nature and the law of nations; he denied that the latter was founded upon express consent, but considered it merely the law of nature applied to nations; he maintained, therefore, that the customs and usages which nations observe in war have no legal obligation in them, and consequently that, unless they are directly deduced from the law of nature, they may be rejected at pleasure. Wolf, who represented rather the school of Grotius than that of Pufendorf, admitted with the latter and with Hobbes that, as aggregate bodies of individuals, nations must be in some degree subject to the law of nature, yet maintained that, in their collective capacity, nations acquire a new character and being, different from that of the individuals of whom they are composed; therefore, in its applications to societies of men, the law of nature must undergo some changes and modifications, and thus is derived the voluntary law of nations. Vattel, a disciple of Grotius, assents to this doctrine of the latter, and develops still further his conception of the law of nations. There is an internal, necessary law, he says, resting upon the natural law or dictates of conscience, and therefore immutable; and there is an external, conventional law, which admits deviations from the former, when these involve an invasion of perfect rights. Finally, according to Vattel, the voluntary law, founded on presumed consent, the conventional, framed by express consent, and the customary, proceeding from the tacit consent of nations, compose the positive international law.—The sources of international law are, according to Grotius, natural law, divine law, customs, and special compacts: *natura ipsa, leges divinae, mores, et pacta*. In the celebrated reply made by the British government in 1753 to a Prussian state paper, the law of nations is said to be founded upon justice, equity, convenience, and the reason of the thing, confirmed by long usage. The principle of national justice, founded upon the laws of morality, is, then, the basis of the positive law of nations, that is to say, of the treaties, conventions, and usages which compose it. It is the office of

right reason to apply this natural law of equity to the circumstances of each case; and it is the art of applying this law, according to justice and guided by reason, which renders international jurisprudence a particular science. Treaties and usages offer evidence of the general consent of nations, and are important sources of the law. The customary law of nations is further expressed in manifestoes and declarations of war and in the decisions of prize courts. Finally, the concurrent testimony of the great writers upon the science, and the written opinions which official jurists give to their governments, are further evidence and depositories of the law of nations.—States are the proper and immediate subjects of this international law. A state is defined by Phillimore as "a people permanently occupying a fixed territory, bound together by common laws, habits, and customs into one body politic, exercising, through the medium of an organized government, independent sovereignty and control over all persons and things within its boundaries, capable of making war and peace, and of entering into international relations with other communities." The sovereignty of a state depends upon its existence *de facto* as a state; and until this is recognized by other nations, the state enjoys no share in international rights. When once, however, it is admitted into the society of sovereign states, it is the equal of each of these. States may combine and form a confederacy, in which each retains its independent power and sovereignty, or may form a federal government or composite state, which alone is the sovereign power.—It is the clear right of every sovereign state to maintain its political integrity in the society of nations. It may, therefore, justly assert its independence of and its equality with all other sovereign states, and by all the modes permitted in the practice of nations it may confirm its power and extend its domain, either by the acquisition of new territory, the extension of its commerce, or the development of its internal sources of wealth. All these rights presuppose that of self-preservation. The state may, then, to this end, form alliances, provide land and sea forces, build fortifications, or employ any other usual means for its defence. With these measures other powers have no right to interfere, unless they assume an aggressive character, and seem to threaten the security of such states. Thus a sudden and extraordinary increase of armaments would furnish good reason for demanding an explanation of the object of such warlike preparations. Further, by virtue of its independence, every sovereign state may adopt whatever form of government and whatever political institutions it may prefer, free from the control of any foreign power. Still each state is to remember that all other sovereign states are its equals, and therefore that it may not, by any measures of its private legislation or policy, virtually invade the sovereignty of others. When in 1792 the French national convention declared that it would

render aid to all nations that might wish to recover their liberty, and ordered the decree to be printed in all languages, Great Britain was regarded as justified by the law of nations in treating the resolution as a declaration of war against all nations.—Another clear right of every sovereign state is that of exclusive property in its territory, and therefore of complete inviolability. This right is derived either from conquest or from occupancy, confirmed, as in the case of private individuals, by the right of prescription; or it may rest upon express treaty or conventions with foreign states. As against other powers, the right to territory is exclusive; in respect to its own subjects, the right is paramount, and constitutes what is called the state's right of eminent domain. Mere discovery by the subject of a nation does not give title to his sovereign, unless the sovereign commissioned him to this intent, or subsequently confirmed his claim of discovery by adopting it. Much too depends in respect to right of acquisition upon occupancy. Therefore, in the case of newly discovered lands, not only is some formal act usually considered necessary in taking possession, but the right will hardly be protected and confirmed without use and settlement of the territory. But how far the territorial sovereignty shall extend, even after a settlement, gives rise to very difficult questions of international law. These principles received very ample discussion in our conventions and treaties with Great Britain concerning the northwestern coasts and territory.—The state's exclusive jurisdiction extends of course over all rivers and lakes which are entirely enclosed within its boundaries. But it is difficult to determine rights when a river forms the boundary between or flows through the territory of different states. When a river forms the limit of conterminous states, the presumption is that both of these have the right of navigation in the whole river, though, according to the Roman law, the middle line of the river forms the strict limit between the two. But in respect to rivers which at any part of their course lie within the territory of a single state, the strict rule is, that the right of navigation here, for those even who border upon it higher up in its course, is but an imperfect one, and the right of a passageway may be conceded or withheld as it may seem good to the state through whose domain the river flows. The strictness of this rule was insisted upon by Great Britain against our government in regard to the St. Lawrence. The United States claimed the right of navigation down the river to the ocean, in virtue of their proprietary right in the great lakes through which it passes. By the treaty of 1854 Great Britain conceded to this country the privilege of navigation, subject to revocation, but still, as it had always done, denied our natural right to enjoy it. But by the treaty of 1871 the river was made for ever "free and open for the purposes of commerce to the citizens of the United States, subject to

any laws and regulations of Great Britain or of the Dominion of Canada not inconsistent with such privilege of free navigation." Over straits, or those narrow passages which communicate between two seas, a state may possess an exclusive control if both shores belong to her, and if the navigation of either sea to which they lead be subject to her exclusive power. Thus, while the Black sea belonged exclusively to Turkey, and the Bosphorus and Dardanelles were both bordered by her territory, the jurisdiction over these was rightfully claimed by the Porte. But when the navigation of either of the seas is free, the right to control the straits must be modified by the necessities and rights of commerce. By the treaty of Paris of 1856 the Black sea was opened to the commerce of all nations, and the clause of that treaty excluding all ships of war was abrogated at the close of 1870. A state cannot be completely secure without extending its authority over some portion of the waters which wash its coasts. By the general law of nations, which may however be modified by unquestioned usage or by special compacts, this authority reaches over a marine league, or the distance measured by a cannon shot from the shore at low tide. For the prevention of frauds upon the revenue laws in time of peace, or to prevent war ships of a belligerent power from cruising so near the coast as unfairly to menace homeward or outward bound ships, it is the practice of nations, certainly of Great Britain and the United States, to exercise jurisdiction for these purposes within four leagues from the coast. Over all bays and gulfs, and those parts of the sea which are included within lines drawn between headlands, the state has unquestioned right. The open ocean is the common territory of all nations.—Finally, it is an incident of sovereignty that the state may exercise exclusive jurisdiction over all persons within its limits, whether they be its own subjects or those of foreign states. It has an undoubted right to the service of its citizens, the right to forbid their departure (a power which is actively exercised by some European states), and the right to recall them from foreign countries. It may dismiss foreigners, or by an act of naturalization adopt them into its citizenship. From the principle of exclusive sovereignty it also follows, that the laws of every state govern not only the persons who dwell in it, but control all property, real and personal, within the territory, and all acts done and contracts concluded there. The state concedes no proper force to foreign laws, yet upon the principle of reciprocity, complete or partial, or upon considerations of equity or international comity, they may be recognized and allowed their effect. It is plain that the tenure, the title, and the modes of conveyance of real property must be uniformly governed by the laws of the country where it is situated. Hence it is a rule of the English and American law that a deed or will executed in a foreign country, or

in another state of the Union, must be executed with the formalities which are required in that state in which the land lies. On the European continent, however, a different rule is admitted, and a deed or will, properly executed where it is made, may dispose of real property lying in another jurisdiction, no matter what forms of execution may be demanded there. As to personal property, it is now the well settled rule of international jurisprudence, that the law of the owner's domicile must govern the succession to it wherever the property may be. The municipal laws of states may sometimes have an extra-territorial effect, so far, for example, as to determine the civil and personal capacities of their citizens while residing in foreign countries, or in defining the obligations of contracts made within their territory, but sought to be enforced in foreign jurisdictions. But in neither case will the foreign state resign its control over property lying within its limits, or admit the operation of other laws than its own, when that would prejudice the rights or interests of its citizens, or in any degree infringe its own sovereign authority. The jurisdiction of a state extends also so far as to exempt its sovereign, or his ambassador, or his fleets and armies, from the operation of the laws of a country where they may be. The same exemption extends to its fleets and armies, when they are suffered to pass through a foreign state, and generally to its public ships. These exemptions rest on the promise implied in the comity of nations that no state will exercise its jurisdiction over that which most intimately affects the sovereignty of another. Special conventions may concede to consuls an authority over their countrymen in the foreign states in which they reside. In Christian countries this authority is usually limited to such civil matters as those arising out of disputes between ship masters and seamen, and to the ministerial acts of attesting contracts and protests, and authenticating other mercantile instruments. In criminal affairs the consul's jurisdiction is limited to the infliction of fines, and in grave cases it is his duty to collect evidence, and send the accused to his own country for trial. In semi-civilized and barbarous countries our consuls often possess complete and exclusive jurisdiction over matters relating to their countrymen.—Except as it is modified by treaty, the judicial power of every state is coextensive with its territory. It reaches all offences committed against its laws, whether by its own subjects or by aliens, and whether within its landed domain or on board its ships, public or private, upon the high seas, or on its public ships in foreign ports. As to the return for trial and punishment of offenders who escape to a foreign jurisdiction, see EXTRADITION.—Though sovereign states are equal, so far as essential rights are concerned, yet in respect to titles and similar distinctions, some of them may assert a preëminence over others. Thus, in virtue of the "royal honors" which every empire and

kingdom in Europe enjoys, these powers may claim certain exclusive privileges of a commercial nature, and take precedence of states which are inferior in dignity. To avoid contests or questions of superiority, the order of signature to public instruments has been often determined by lot, by the use of the alphabet, or by the *alternat*, by which latter mode the representative of each government signs first in order the copy intended for his own government.—Every independent power possesses the right to send and to receive embassies. In monarchies the prerogative usually resides in the sovereign. In composite states, like the United States, it is generally reserved to the federal government, that is, to the supreme executive power. By grant from their respective governments, the right of embassy has been often exercised by the governors of great colonial states. Thus, the British governors general of India, the Spanish governors of the Philippines, and the Dutch governors of Java have possessed the right; so have the Dutch, French, and British East India companies. A merely rebellious colony cannot assert a *jus legationis*; but when rebellion has grown to war, and rebels have become enemies, powerful enough to maintain their hostile and independent posture, then they become capable of new rights, including that of negotiation and therefore of embassy. Yet, as to indifferent states, the international position and right of the revolted colony depend on their recognition of it. The state which has the right to send embassies has also the right to receive them, though there is perhaps no perfect obligation in either case, under the positive law of nations. Phillimore says that a state is bound to give audience to an ambassador, and, except under extraordinary circumstances, to receive him for that purpose into its territory and at its court; though, he adds, it may make conditions as to the nationality of the minister, refusing, for example, to receive one of its own subjects. The privilege of continuous residence rests in comity, and is not matter of right. Public ministers are commonly divided into three classes. The first of these comprises ambassadors ordinary and extraordinary, as the mission is limited or indeterminate in point of time, and papal legates and nuncios, ordinary and extraordinary. These all have the representative character, and are entitled to the same honors which the sovereign power would itself receive. Diplomatic agents of this rank can be sent only by crowned heads, the great republics, and other powers which enjoy royal honors. The second class includes envoys ordinary and extraordinary, ministers plenipotentiary, and internuncios of the pope. In the third class are ranked *chargés d'affaires* accredited to ministers of foreign affairs, and consuls, such as those maintained in the Barbary states by the European powers, who bear credentials as public agents of their governments. Ministers resident accredited to the sovereign are sometimes ranked as a sepa-



rate class between *chargés d'affaires* and envoys and ministers plenipotentiary. The public character of an ambassador at a foreign court is recognized upon the production of his letters of credence. In the case of a *chargé d'affaires*, these are addressed by one minister to another. In the case of ministers of all the higher ranks, they are addressed to the sovereign. The full power which authorizes the diplomatic agent to negotiate is in modern times given separately from the letter of credence. During his residence the public minister is entitled to perfect inviolability, and to exemption from the local civil and criminal jurisdiction. This immunity extends also to the members of his household, whether they belong to his own family or to the diplomatic corps, and also to his house and personal property. A consul cannot claim these privileges of exemption which are accorded to public ministers. So far, indeed, as he is impressed with a public character his right extends; but ordinarily he is subject to the local tribunals, like any other resident foreigner. A minister's public mission is terminated by his recall, or by the decease or abdication of his own or of the sovereign to whom he is accredited; by his own declaration to this effect, when on account of any infraction of the law of nations he thinks it his right to do so; by his dismissal from the court at which he is residing; or by the final accomplishment or failure of the object of his mission.—International rights are often defined by specific conventions. As in respect to embassies, so in regard to treaties, the power to make them resides generally in the supreme executive authority. But they will be exactly determined by the fundamental law of the state. In virtue of their full powers, diplomatic agents may sign treaties, but generally these are not binding upon their governments until they are ratified by the supreme authority. Under the constitution of the United States treaties become obligatory only with the advice and consent of the senate. But once ratified in prescribed form, the treaty is binding upon the contracting states, no matter what legislative measures may be required in order to carry it into effect. The constitution gives to the president and senate the treaty-making power. Congress cannot defeat this provision by refusing to pass appropriation bills or other measures, when the engagements entered into are within the constitutional limits. This question has been much considered, especially in its bearing upon Jay's treaty of 1794, and the treaty for the acquisition of Alaska; and the power of congress to withhold laws required by treaties has been asserted in debate, but never finally insisted on. Treaties in the proper sense of the word, like those of alliance or amity, of commerce and navigation, exist only so long as the parties exist who made them. They expire, therefore, if either loses its sovereignty, or if circumstances change so much as to make the treaty utterly foreign to the ex-

isting condition of things. They may also be annulled by the outbreak of war, or expire by their express limitation. Treaties of alliance may be either offensive or defensive, as they engage to render aid, aggressively or defensively, against other powers. In the event of hostilities, the contracting powers become allies against the common enemy; but not so when a state contracts generally to furnish to another a certain definite succor by war supplies in case of war. Apart from its particular engagements, such a state is neutral. Guaranties are frequent forms of international compacts. Agreements to defend the particular constitution of a country against every aggression, or to secure the liberties of a single state during war between other powers, are instances of these obligations.—Sovereign states being equal, it follows that there can be no supreme tribunal of appeal. Except therefore by submission of their wrongs to arbitration, nations can have no redress for them except by resorting to force. When, then, differences have arisen, and they cannot be composed by negotiation or other peaceful means, the injured state may employ the forcible measures of retaliation, of reprisals, of embargo or the sequestration of the goods of the offending power, or, finally, of war. Embargoes or sequestrations are often declared as preliminary measures to active hostilities. A declaration of war has a retroactive effect, and the property already seized is placed upon the same footing as that taken during the war. Reprisals are general or special. They are general when a state authorizes its subjects to capture the goods and attack the subjects of the offending power, wherever they may be found. In the modern practice of nations, general reprisals are deemed synonymous with war, and are indeed the initiative step to hostilities. When wrong is done to particular individuals in time of peace, and justice is plainly refused or unreasonably withheld, letters of marque may be issued to the parties, or a public ship be commissioned to avenge their wrong. These are instances of special reprisals. The ownership of the property taken is acquired, so far as it is necessary to satisfy the debt, or otherwise compensate for the injury committed; the surplus must be restored to the government of the subject against whom the right has been exercised. In modern times letters of reprisal are chiefly confined to goods, and would hardly be granted to a private individual during a general peace.—The precise extent of obligation resting upon a neutral nation to pass and enforce laws in order to prevent its territory being made use of in originating hostile measures against a power with which it is at peace, has never been fully determined. All authorities agree that the government must not aid or give countenance to such measures, but how active it is required to be in thwarting them, and how stringent and effectual its legislation should be to that end, in order to preserve its character as a neutral

and friendly state, were the subject of very earnest discussion in the controversy between the United States and Great Britain preceding the treaty of Washington of 1871, and also at the Geneva conference held under its provisions. In that treaty the British government agreed to the following rules for the future, while not assenting to the claim of the government of the United States that they were in force before. A neutral government is bound : 1, to use due diligence to prevent the fitting out, arming, or equipping within its jurisdiction of any vessel which it has reasonable ground to believe is intended to cruise or to carry on war against a power with which it is at peace; and also to use like diligence to prevent the departure from its jurisdiction of any vessel intended to cruise or carry on war as above, such vessel having been specially adapted, in whole or in part, within such jurisdiction, to warlike use; 2, not to permit or suffer either belligerent to make use of its ports or waters as the base of naval operations against the other, or for the purpose of the renewal or augmentation of military supplies or arms, or the recruitment of men; 3, to exercise due diligence in its own ports and waters, and, as to all persons within its jurisdiction, to prevent any violation of the foregoing obligations and duties. It is probably not too much to say that these rules are regarded by the best authorities of the present day as a correct statement of the duties of a neutral in the particulars covered by them. —An open contest between sovereign states is called a public war. It may be general, extending to all persons and places in the two states, and is then called a perfect war; or it may be imperfect, as it is limited in these respects. Once it was considered necessary to declare war formally before proceeding to hostilities; now it is customary to declare simply that war exists. Forthwith, all enemy property is, by the law of war, subject to confiscation; thus, debts due from one state to the other may be sequestered, or property lying within the territory of either be seized as prize of war. But in the exercise of international comity these rights are not usually enforced. The obligation of debts is, as it were, suspended during war, but the right of recovery revives with the peace; and enemy's ships in port may be allowed to depart, and those on their voyage thither to enter, discharge their cargoes, and sail without molestation. All commerce between the subjects of belligerent states is interdicted by the laws of war; yet for good reasons either power may, by express license, permit a partial intercourse. Very large indulgence was shown in this respect, and for the interests of commerce, by England in the last war with Russia. Provided only that British ships did not enter ports in possession of the enemy, the commerce with the enemy, though indirect, might still be carried on. The interdiction of intercourse between belligerents extends not only to commerce, but to every

species of contract, such as insurance of enemies' property, the drawing of bills on subjects of the enemy, or the remission of funds to them by bills or money. So too partnerships existing between the subjects of hostile states are absolutely dissolved by a declaration of war. In the language of Lord Bacon, war is the highest trial of right. It has also been defined as an exercise of the international right of action. Its end and object is to compel justice from an enemy, and it must be prosecuted with steady regard to that end. All measures of force which must be employed to attain it are justifiable, but no others are permissible. Therefore wanton waste of the enemy's country, or wanton destruction of the property or lives of his subjects, are in the modern practice of nations unjustifiable and illegal. Generally, all those who are engaged in the merely civil affairs of life are exempted from the direct effects of war, and only those who are expressly or impliedly authorized by the commands of the state to represent its sovereignty are ordinarily subjected to hostile attack. Property at sea, however, makes an exception to the usual indulgence shown to the goods of an enemy; for ships and their cargoes upon the ocean are liable without exception during war to seizure and confiscation, and even if captured by uncommissioned cruisers are condemned as good prize of war. The abolition of privateering was proposed to the United States by the governments represented in the congress of Paris in 1856; but the proposition was then declined, and when Mr. Seward in 1861 offered to assent, the offer was declined by Great Britain in view of the then existing circumstances. The validity of all claims of prize and capture is determined by the prize courts of the captor's country. These may sit either within their proper territory or in that of an ally, and exercise jurisdiction over captured property lying either in their own ports or in those of an ally or of a neutral. They possess a jurisdiction, in respect to captures made by subjects of their sovereign, exclusive of the tribunals of all other nations, excepting only in cases when the capture was made upon the territory of a neutral, or by vessels fitted out within a neutral's limits. These cases involve an invasion of the neutral's sovereignty, and must be adjudicated in his court. The decisions of prize courts are final and conclusive upon rights of property involved; and if their judgments work injustice to the subjects of other powers, their claims to reimbursement must be adjusted between the sovereigns of their respective states. The demand for the surrender of Mason and Slidell, the confederate emissaries seized on board the Trent in 1861, was assented to by the United States government, because Capt. Wilkes had neglected to bring the Trent into port in order that the proper adjudication might be had to determine the lawfulness of the seizure. — Either for ordering the general conduct of war, or for

lightening its rigors, belligerent states may enter into general or special conventions. The former are often made at the beginning of the war, and lay down the rules to be mutually observed in the war, respecting the exchange and redemption of prisoners, concerning passports, safe-conducts, and similar matters, or agree to abstain from certain modes of warfare, or from levying contributions on invaded territory. Particular conventions are made during war, and concern either truces or partial suspensions of hostilities or capitulations, that is, surrenders of particular forces or places. The power to conclude a truce is generally implied in the official character of every high officer, like a general or admiral, but not the capacity to make a long or universal armistice; for that amounts to peace, which only a sovereign can make, and therefore it requires either the sovereign's previous special authority or his subsequent ratification. A truce is binding upon the two states whose officers conclude it, and they therefore are liable for every infraction of its terms, but not upon those to whom its existence has not been actually notified; and for the purpose of avoiding the mischiefs which may arise out of ignorance of the truce, it is usual to fix prospectively the time when it shall commence. While the truce lasts all warlike acts and preparations must entirely cease, though it does not hinder acts which are allowable in time of peace. But at the place to which the cessation of hostilities particularly applies, a belligerent may not do what he would be allowed to do at a greater distance. That is to say, one party must not take advantage of the temporary peace to perfect its measures of attack or siege, nor may the other repair breaches in its works, or introduce succors or reinforcements, or indeed do anything which would have been impossible if active hostilities had continued.—No state is bound to take part in the wars in which other powers may be engaged. Yet, though the right to remain neutral be one of the clearest rights of its sovereignty, no independent state can retain the same complete independence which it enjoys in time of general peace. A state of war between some members of the society of nations imposes certain positive obligations and restrictions on all the rest. Except when it is bound to do it by previous treaty stipulations, the neutral state may not render assistance to either belligerent party in the prosecution of war, that is, it must not furnish arms, troops, ammunition, or the like, to either side; and further, in matters which do not directly concern the war, it must not refuse to one belligerent that which it grants to the other. On the other hand, if the state observe strictly the conditions of neutrality, it is entitled to perfect inviolability of its territory, and in other respects to complete immunity from the effects of war. Whether the neutral's exemption can be claimed absolutely for its ships, so as to protect the enemy goods which they carry,

has given rise to one of the most vexed questions in international law. It has never been doubted that the neutral's public ships are exempt from all intrusion, and therefore that they cannot be visited and searched for enemy property. In respect to private merchant ships, the practice of different nations has been widely diverse. By express conventions England has sometimes admitted the rule that "free ships make free goods," but, though admitting it again during the war with Russia, declared expressly that she only "waived" her right to seize enemy goods on board neutral vessels. Especially in its treaties, the United States has advocated the adoption of the rule. By the declaration signed at the congress of Paris in 1856 by the representatives of the chief European powers, the principle that neutral ships may carry enemy goods has finally become established, it may be presumed, in the law of nations. The same declaration sanctions the rule that neutral property, except contraband, is not subject to capture though laden in enemy ships. General trade with belligerents is not interdicted by war. The single restriction imposed on commerce is, that it shall not supply either of the hostile parties with means for carrying on the war. A neutral must not carry goods contraband of war, nor bear despatches, nor transport troops to either of the powers at war. Contraband cannot be easily defined, though the proper criterion is, whether the goods be or not *usus bellici*; that is, whether the goods are peculiarly and specifically adapted to serve the uses of war. Contraband property is subject to confiscation by the captor. The strict construction of the principles of neutrality makes the carrying, perhaps even the selling of contraband property in the neutral's home ports, to be a violation of the neutral character. The United States maintains the contrary doctrine, that both such sale and carriage are consistent with neutrality, though during the transit the goods may be rightfully seized and confiscated. Further, the neutral must not send his ships to blockaded ports, for this would be an intermeddling directly in the war measures of belligerents. But the law of blockade is so strict, that to subject a neutral to its operation, the blockade must exist in point of fact; that is to say, there must be a squadron present, and strong enough to constitute an actual blockade of the port; the neutral must have had due notice of its existence, and must have been guilty of some clear act of violation, either by going in or coming out with a cargo laden after the commencement of blockade. Finally, the neutral must be ready to prove himself that which he professes to be, and his ships must therefore be subject to the exercise of the belligerent right of visitation and search.—When the objects of war are accomplished, peace must be reestablished. Generally this takes place upon the conclusion of a formal treaty of peace between the belligerent states.

The power of making a peace is determined by the fundamental law of every state. Under our constitution the assent of the two houses of congress is essential to a declaration of war; but the president, with the consent of two thirds of the senate, may agree upon a peace. A treaty of peace takes effect from the day when it is ratified. Every act of force or violence subsequent to that is unlawful. Yet the party who is guilty of it is not criminally guilty if he had no notice of the peace; and in the case of a capture under such circumstances, the captor's sovereign is bound to effect restitution of the property. So when a period has been fixed for the cessation of hostilities at a specified locality, and before the period has arrived, but with a knowledge of the peace, a capture has been made, the capture is void. The treaty puts an end to the war, and puts at rest for ever the debated matters which were its cause. It leaves everything in the state in which it finds it. Conquered lands and fortresses remain with the conqueror, unless otherwise stipulated. Generally, things which by the treaty are to be restored must be restored in the condition in which they were taken. Thus if a conqueror has rebuilt a town or fortress, and made it what it was before the siege, he should restore it in that condition; but any new works which he has added he may destroy. The particular peace restored by treaty may be broken by omitting to fulfil its stipulations, or by doing some act which contravenes them. The violation of one article is a breaking of the whole treaty, and ends the peace.—The settlement of international disputes by arbitration, or by the establishment of a special international court for the controversy, has been often resorted to; and in the conspicuous instance of the Alabama claims, that method of arrangement was brought more particularly to the favorable consideration of the civilized world than ever before. There are not wanting those who believe it destined rapidly to supersede the resort to arms, and those who do not share this expectation have reason to believe that the terrible arbitrament of war will be often averted by an agreement upon such courts.—See "Elements of International Law," by Henry Wheaton, and particularly the recent editions by William Beach Lawrence (2d ed., Boston, 1863) and Richard H. Dana (8th ed., Boston, 1866); "Commentaries upon International Law," by Robert Phillimore, M. P. (4 vols., London, 1854-'61); "Lectures on International Law," by Travers Twiss, D. C. L. (London, 1856); "Introduction to the Study of International Law," by Theodore Dwight Woolsey (Boston, 1860; 4th ed., revised and enlarged, New York, 1874); "International Law, or the Rules regulating the Intercourse of States in Peace and War," by Maj. Gen. H. W. Halleck, U. S. A. (New York, 1861; Philadelphia, 1866); and numerous foreign authorities referred to in these. Some initiatory steps

have recently been made looking to an authoritative codification of international law, but they have reached as yet no important result. Dr. Bluntschli of Heidelberg has published a work upon the subject; and Mr. David Dudley Field published "Outlines of an International Code" (New York, 1872).—There is another branch of the law of nations, commonly designated private international law, which supplies the rules under which the ordinary courts of justice determine the rights of private parties, where they arise wholly or in part in a foreign jurisdiction. These rules have been treated elaborately by Judge Story in his "Conflict of Laws" (6th ed., revised and enlarged, edited by I. F. Redfield, Boston, 1865), and recently by Mr. Francis Wharton under the same title (Philadelphia, 1872). A treatise by F. K. Savigny on the same subject has been translated into English (London, 1869). Instead of considering them separately here, we refer to them, in their application to contracts, marriage, and other subjects, under the proper titles. (See also *Lex Locri*.)

**LAWRENCE, John**, an American statesman, born in Cornwall, England, in 1750, died in New York in November, 1810. He emigrated to America in 1767, settled in the city of New York, was admitted to the bar in 1772, and soon established himself in successful practice. An active patriot at the outbreak of the revolution, he served in the army throughout the war, first as aide-de-camp to his father-in-law Maj. Gen. McDougall, and afterward attached to the general staff as judge advocate general. In the latter capacity he conducted the proceedings of the court of general officers appointed to inquire into the case of Major André. On the termination of hostilities he returned to New York, where for many years he was engaged in a large and lucrative professional practice. In 1785-'7 he was a delegate to the congress of the confederation, but was superseded in 1788 in consequence of his advocating the new federal constitution. He was a member of the state senate when in 1789 he was elected the first representative from New York city in the first United States congress. He was a zealous and able defender of the measures of Washington, and a political and personal friend of Hamilton. He was elected to the second congress, and in 1794 was appointed judge of the United States court for the New York district. He resigned in 1796 upon being elected to the United States senate, of which he was for a time president. He supported the measures of President Adams, upon whose retirement he resigned and withdrew to private life.

**LAWRENCE**, the name of ten counties in the United States. **I.** A W. county of Pennsylvania, bordering on Ohio, and watered by Beaver river and its constituents the Mahoning and Chenango; area, 360 sq. m.; pop. in 1870, 27,298. It contains limestone and valuable coal and iron mines; the surface is somewhat uneven and the soil fertile. It is traversed by

the Beaver and Erie canal, and by the Erie and Pittsburgh railroad, and the New Castle and Youngstown branch of the Pittsburgh, Fort Wayne, and Chicago road. The chief productions in 1870 were 235,407 bushels of wheat, 349,353 of Indian corn, 547,783 of oats, 119,777 of potatoes, 63,944 lbs. of flax, 268,127 of wool, 716,229 of butter, and 27,965 tons of hay. There were 6,245 horses, 7,650 milch cows, 7,294 other cattle, 61,373 sheep, and 9,380 swine; 3 manufactories of brick, 3 of brooms, 8 of carriages, 1 of window glass, 16 of iron, 1 of machinery, 5 of saddlery and harness, 5 of woollen goods, 1 distillery, 12 flour mills, 3 planing mills, and 16 saw mills. Capital, New Castle. **II.** A N. W. county of Alabama, bounded N. by Tennessee river, the Muscle shoals of which occur in this part of its course; area, 725 sq. m.; pop. in 1870, 16,658, of whom 6,562 were colored. It has a mountainous surface and a good soil. The Memphis and Charleston railroad passes through it. The chief productions in 1870 were 20,233 bushels of wheat, 519,673 of Indian corn, 14,143 of sweet potatoes, 174,063 lbs. of butter, and 9,243 bales of cotton. There were 2,570 horses, 1,816 mules and asses, 3,748 milch cows, 5,832 other cattle, 5,095 sheep, and 18,627 swine. Capital, Moulton. **III.** A S. county of Mississippi, traversed by Pearl river; area, about 700 sq. m.; pop. in 1870, 6,720, of whom 3,042 were colored. Part of the surface is covered with pine forests. The soil is of various quality. The New Orleans, Jackson, and Great Northern railroad passes through it. The chief productions in 1870 were 140,917 bushels of Indian corn, 21,869 of sweet potatoes, 2,782 bales of cotton, and 15,806 lbs. of rice. There were 1,051 horses, 1,718 milch cows, 1,046 working oxen, 2,622 other cattle, 4,014 sheep, and 8,669 swine. Capital, Monticello. **IV.** A N. E. county of Arkansas, drained by Black river and its branches; area, about 600 sq. m.; pop. in 1870, 5,981, of whom 246 were colored. It has a level or moderately diversified surface, with much fertile soil. The chief productions in 1870 were 47,450 bushels of Indian corn, 15,867 lbs. of butter, and 1,023 bales of cotton. There were 526 horses, 659 milch cows, 1,475 other cattle, and 5,471 swine. Capital, Smithville. **V.** A S. county of Tennessee, bordering on Alabama, and drained by small affluents of the Tennessee river; area, 780 sq. m.; pop. in 1870, 7,601, of whom 565 were colored. It contains valuable iron mines. The surface is chiefly table land, and the soil is fertile. The chief productions in 1870 were 31,321 bushels of wheat, 189,695 of Indian corn, 22,095 of oats, 32,417 lbs. of tobacco, 10,598 of wool, and 522 bales of cotton. There were 1,745 horses, 1,867 milch cows, 2,986 other cattle, 5,520 sheep, and 13,584 swine. There were 6 cotton factories. Capital, Lawrenceburg. **VI.** A N. E. county of Kentucky, separated from West Virginia by Big Sandy river, and drained

by the W. fork of that stream and by Little Sandy river; area, 205 sq. m.; pop. in 1870, 8,497, of whom 121 were colored. Coal and iron are abundant. The surface is hilly, and in many places well timbered, and the soil is of excellent quality. The chief productions in 1870 were 11,237 bushels of wheat, 222,659 of Indian corn, 29,782 of oats, 16,626 of potatoes, 11,935 lbs. of tobacco, and 12,918 of wool. There were 1,054 horses, 1,474 milch cows, 1,361 working oxen, 2,291 other cattle, 8,454 sheep, and 9,430 swine. Capital, Louisa. **VII.** A S. county of Ohio, separated by the Ohio river from West Virginia and Kentucky; area, 430 sq. m.; pop. in 1870, 31,380. It has rich mines of iron and coal, and beds of clay suitable for stone ware, and is the chief seat of the iron manufacture in the state. The surface is broken by sandstone hills, but the soil of the valleys is rich. The Iron railroad passes through it. The chief productions in 1870 were 116,058 bushels of wheat, 523,858 of Indian corn, 71,987 of oats, 52,054 of potatoes, 33,370 lbs. of tobacco, 19,336 of wool, 187,174 of butter, and 5,103 tons of hay. There were 2,522 horses, 2,316 milch cows, 5,593 other cattle, 8,512 sheep, and 9,747 swine; 11 manufactories of charcoal, 11 of cooperage, 22 of iron, 1 of engines and boilers, 3 of saddlery and harness, 21 of tin, copper, and sheet-iron ware, 2 planing mills, 7 saw mills, and 4 flour mills. Capital, Ironton. **VIII.** A S. county of Indiana, watered by the E. fork of White river; area, 433 sq. m.; pop. in 1870, 14,628. The surface is undulating and well timbered, and the soil is fertile. The Louisville, New Albany, and Chicago, and the Ohio and Mississippi railroads pass through it. The chief productions in 1870 were 139,340 bushels of wheat, 591,824 of Indian corn, 127,640 of oats, 30,229 of potatoes, 10,073 lbs. of tobacco, 55,843 of wool, 213,125 of butter, and 5,264 tons of hay. There 5,266 horses, 1,516 mules and asses, 3,564 milch cows, 9,984 other cattle, 19,984 sheep, and 23,489 swine; 3 flour mills, 2 saw mills, and 1 manufactory of tobacco and cigars. Capital, Bedford. **IX.** A S. E. county of Illinois, separated from Indiana by the Wabash river, and intersected by its tributary the Embarras; area, 560 sq. m.; pop. in 1870, 12,533. The surface is diversified, and is occupied partly by fertile prairies and partly by swamps. The Ohio and Mississippi railroad traverses it. The chief productions in 1870 were 264,134 bushels of wheat, 656,363 of Indian corn, 131,386 of oats, 33,855 of potatoes, 41,220 lbs. of wool, 93,941 of butter, and 7,701 tons of hay. There were 4,375 horses, 3,053 milch cows, 4,963 other cattle, 15,482 sheep, and 17,654 swine; 5 carriage factories, and 3 flour mills. Capital, Lawrenceville. **X.** A S. W. county of Missouri, drained by Sac river and the head streams of Spring river; area, 573 sq. m.; pop. in 1870, 13,067, of whom 259 were colored. It has a hilly and undulating surface, and a good soil. Coal is found in the



N. W. part. The Atlantic and Pacific railroad passes through the S. E. corner. The chief productions in 1870 were 135,838 bushels of wheat, 621,495 of Indian corn, 222,723 of oats, 40,225 of potatoes, 21,770 lbs. of tobacco, 24,514 of wool, 148,164 of butter, 2,696 tons of hay, and 66 bales of cotton. There were 6,917 horses, 991 mules and asses, 4,043 milch cows, 6,149 other cattle, 12,444 sheep, and 22,076 swine; 5 flour mills, 8 saw mills, and 3 wool-carding and cloth-dressing establishments. Capital, Mount Vernon.

**LAWRENCE**, a city and one of the shire towns of Essex co., Massachusetts, situated on both sides of the Merrimack river, here crossed by two bridges, about 26 m. from its mouth, 22 m. N. of Boston, and 10 m. N. E. of Lowell; pop. in 1850, 8,282; in 1860, 17,639; in 1870,

the N. section of the city is a common of 17½ acres, ornamented with a fountain, the water for which is supplied by a reservoir on Prospect hill, an eminence 140 ft. high. In the S. section are Union square and a trotting park. The city cemetery is in the N. W. part of the N. section. The principal public buildings are the county court house, county jail, city hall, high school building, masonic temple, music hall, and odd fellows' hall. Railroad communication is furnished by the Boston and Maine, the Eastern, the Manchester and Lawrence, and the Lowell and Lawrence lines, and horse cars run to the adjoining towns. The industry of Lawrence is chiefly devoted to cotton and woollen manufactures. Water power is collected by a dam across the Merrimack, built in 1845-'8 at a cost of \$250,000. It is a



City Hall, Lawrence.

28,921, of whom 12,717 were foreigners. There were 5,287 families and 3,443 dwellings. The Spicket river crosses the N. portion of the city and falls into the Merrimack, and the Shawsheen forms a portion of the S. and E. boundary. Near the centre of

\$200,000. These works were constructed by the Essex company, incorporated in 1845, which still controls them, selling and leasing mill sites. The statistics of the principal cotton and woollen manufacturing establishments appear in the following table:

CORPORATIONS.	Date of incorporation.	Capital.	No. of looms.	Spindles.	Operatives.	Yards manufactured per week.
Atlantic cotton mills.....	1846	\$1,500,000	1,800	87,000	1,250	430,000
Lawrence duck company.....	1853	300,000	70	8,000	250	25,000
Pacific mills.....	1853	2,500,000	8,672	136,609	4,299	50,000
Washington mills.....	1858	1,650,000	1,265	61,560	2,900	.....
Everett mills.....	1860	800,000	788	33,000	1,060	135,000
Pemberton company.....	1860	450,000	669	28,000	850	100,000
Lawrence woollen company.....	1863	150,000	40 (broad)	.....	120	.....
Arlington woollen mills.....	1865	240,000	880	4,480	850	.....
Total.....	.....	\$7,590,000	8,634	358,649	11,079	.....

The Pacific mills have extensive print works, and the Washington mills a large dye house. The Atlantic mills manufacture sheetings and shirtings; the Pacific mills, calicoes, shirtings, lawns, delaines, alpacas, serges, and other worsted dress goods; the Washington mills, cam-

brics, shawls, broadcloths, doeskins, opera flannels, and other worsted goods; the Everett mills, cotton fancy cassimeres, gingham, poplins, pantaloons stuffs, and dress goods; the Pemberton company, a variety of cotton and woollen goods; the Arlington mills, ladies'

worsted and cotton dress goods. There is a variety of other manufactories, including one of cordage, four of leather belting, one of cloth boots and shoes, two of cabinet ware, five of carriages, one of earthenware, one of files, one of screws, one of linen hose, six of paper, a brass foundry, and several machine shops, turning out steam engines and boilers, cotton machinery, &c. The city contains three national banks, with an aggregate capital of \$725,000, and three savings banks, with deposits in 1873 amounting to \$3,768,483 21. It is divided into six wards, is governed by a mayor, with a board of aldermen of one member and a common council of three members from each ward, and has a police force and a fire department. Water works, to supply the city from the Merrimack, are in process of construction. The assessed value of property in 1873 was \$21,715,362; total taxation, \$362,827 80, including \$37,581 70 for state and county purposes. The expenditures for city purposes amounted to \$336,150 28, the largest items of which were \$40,683 83 for streets, \$59,164 63 for schools, \$19,386 66 for salaries, \$19,351 78 for paving, \$14,851 25 for fire department, and \$28,078 31 for police. The net debt at the close of the year was \$432,988 59. There are an almshouse, a Catholic orphan asylum, a city mission, and an industrial school. The public schools are graded and in a flourishing condition. The number of children of school age in 1873 was 5,141; number of schools, 59 (1 high, 22 grammar, 1 mixed, 12 middle, 23 primary); of teachers and sub-teachers, 88; pupils enrolled, 4,000; average attendance, 2,500. Evening schools are opened during the winter. There are also Catholic schools attended by about 1,200 pupils. The public library contains about 14,000 volumes; the library of the Pacific mills, 6,000; and there is a circulating library, with 3,000 volumes. Two daily and four weekly newspapers are published, and there are 21 churches, viz.: 2 Baptist, 5 Congregational, 2 Episcopal, 1 Freewill Baptist, 3 Methodist, 1 Presbyterian, 5 Roman Catholic (1 French), 1 Unitarian, and 1 Universalist.—The town of Lawrence was incorporated in 1847, its territory being taken from the towns of Methuen and North Andover. The village had previously been known as Merrimack or New City, and it took its present name in honor of its principal founders, the Lawrence family of Boston, the chief members of the Essex company, which had been chartered shortly before for the erection of the dam and other manufacturing purposes. It was made a city in 1853. On Jan. 10, 1860, the main building of the original Pemberton company, built in 1853, while the machinery was in motion, suddenly fell without warning, and a conflagration soon afterward broke out in the ruins. Of 700 persons in the building at the time, 77 were killed and 134 injured, of whom 14 subsequently died. The cause of the disaster was the faulty construction of the iron pillars which

supported the floor timbers, and lack of adhesive power in the mortar.

**LAWRENCE**, a city and the capital of Douglas co., Kansas, on both banks of the Kansas river, here spanned by two bridges, 70 m. above its mouth, 25 m. E. by S. of Topeka, and 28 m. S. W. of Leavenworth; pop. in 1860, 1,645; in 1870, 8,320. It is built on a rolling slope, and is regularly laid out, with wide streets, partly shaded with trees, and lighted with gas. There are many handsome buildings. Massachusetts street, the principal business thoroughfare, is built up for two thirds of a mile with blocks of brick and stone. The state university, a large and handsome structure, is situated in the S. W. part of the city, upon a bluff called Mount Oread. Lawrence has an important trade, communicating with the surrounding fertile and well timbered country by means of the Kansas Pacific, the Leavenworth, Lawrence, and Galveston, the Lawrence and Southwestern, the Kansas Midland, and the St. Louis, Lawrence, and Denver railroads. The principal manufactories are a planing mill, a machine shop, 7 wagon and carriage factories, 2 agricultural implement factories, 3 grist mills, 2 elevators, 2 breweries, 4 packing houses, a tannery, a soap factory, a woollen factory, a pottery, 3 furniture factories, and 2 mineral water factories, all operated by steam or wind power. A substantial dam has been erected across the Kansas river at this point, capable of furnishing 1,500 horse power for manufacturing purposes. There are two national banks with a capital of \$200,000, a state bank with \$50,000, and a savings bank with \$100,000. There are graded public schools, including a high school department, and attended by about 1,200 pupils, and a library association possessing 3,500 volumes. Three daily, two tri-weekly, and five weekly (one German) newspapers are published. There are 25 churches.—Lawrence was founded in 1854 by settlers from the eastern states under the auspices of the New England emigrant aid society, and became the headquarters of the anti-slavery settlers in the ensuing struggle with the advocates of slavery in Kansas. On Aug. 25, 1863, it was surprised by a band of about 350 confederate guerillas under Quantrell, who killed 145 of the inhabitants, and burned about 200 houses, comprising the greater part of the city.

**LAWRENCE. I. Amos**, an American merchant, born in Groton, Mass., April 22, 1786, died in Boston, Dec. 31, 1852. In 1799 he became a clerk in a country store in Dunstable, and soon afterward in Groton. In April, 1807, he went to Boston, and upon the failure of his employers there, he commenced business upon his own account in December, 1807, as a dry-goods merchant. On Jan. 1, 1814, he entered into a partnership with his brother Abbott, who for the previous five years had been his chief clerk, which continued uninterruptedly until the death of Amos. The business operations of the firm were conducted with great success, and

both brothers aided in the establishment of manufactures in New England, thereby largely adding to their fortunes. The naturally benevolent disposition of Amos gradually led him to resist the demands which his business imposed upon his time and inclinations; and when, after a serious illness in 1831, he was compelled to retire permanently from active participation in the affairs of his firm, he devoted the remaining years of his life to acts of beneficence. From the beginning of the year 1829 till his death he expended, according to his books, \$639,000 for charitable purposes. Nearly five sixths of this amount were given during the last 11 years of his life. Among the public objects of his bounty were Williams college, to which he gave nearly \$40,000; the academy in Groton, now called the Lawrence academy, on which he expended at different times \$20,000; Wabash college, Kenyon college, the theological seminary at Bangor, Me., and several others. Books he distributed in whole libraries, sending collections to many literary institutions and deserving persons. He established and for some time maintained a child's infirmary in Boston, and gave \$10,000 for the completion of the monument on Bunker hill. His private benefactions were almost innumerable, and several rooms in his house were used as the receptacles of articles for distribution.—See "Extracts from the Diary and Correspondence of the late Amos Lawrence, with a Brief Account of some Incidents in his Life; edited by his son, William R. Lawrence, M. D." (Boston, 1855). **II. Abbott**, an American merchant, brother of the preceding, born in Groton, Mass., Dec. 16, 1792, died in Boston, Aug. 18, 1855. In his 16th year he was bound an apprentice to his brother Amos in Boston, and in 1814 he became one of the firm of A. and A. Lawrence, which for many years conducted a prosperous business in the sale of foreign cotton and woollen goods on commission. Subsequent to 1830 they were largely interested as selling agents in the manufacturing companies of Lowell, and in the latter part of his life Abbott Lawrence participated extensively in the China trade. In 1834 he was elected a representative in congress, and was appointed a member of the committee on ways and means. He declined an election to the next congress, but served for a brief period in 1839-'40. In 1842 he was appointed a commissioner on the part of Massachusetts on the subject of the northeastern boundary. He took an active part in the presidential canvass of 1844 as a supporter of Mr. Clay, as he had done four years previous in the election of Gen. Harrison; and in the whig national convention of 1848 he was a prominent candidate for vice president, lacking but six votes of a nomination. In 1849 President Taylor offered him a seat in the cabinet, which he declined; but he accepted the post of minister to Great Britain, which he occupied with credit until October, 1852, when he was re-

called at his own request. The remainder of his life was devoted to his private business. In 1847 he gave to Harvard university \$50,000 to found the scientific school, bearing his name, connected with that institution; and he bequeathed a like sum in aid of the same object. He also left \$50,000 for the erection of model lodging houses, the income to be for ever applied to certain public charities.—See Hunt's "Lives of American Merchants," vol. ii.

**LAWRENCE. I. Sir Henry Montgomery**, a British soldier, born in Matura, Ceylon, June 28, 1806, died in Lucknow, July 4, 1857. He studied in the military college at Addiscombe, obtained a cadetship in the Bengal artillery in 1821, served in the Afghan campaign in 1843, and in the same year, having then reached the rank of major, was appointed British resident at Katmandu. He distinguished himself in the Sutlej campaigns, and from 1846 to 1849 was agent for the governor general on the N. W. frontier and resident at Lahore. He was next appointed chief of the board of administration in the Punjab, and received the commission of colonel. From 1852 to 1857 he was agent of the governor general in Rajpootana. Although ill health demanded his return to England, he consented at the request of the Indian government to assume the chief commissionership of Oude, and arrived at Lucknow in March, just before the commencement of the mutiny. When the first disturbances occurred he demanded and obtained full powers as chief military commander in Oude, receiving at the same time a commission as brigadier general, and the memorable defence of the residency was made under his direction up to the time of his death. He was mortally wounded by a shell July 2, and died at the residency two days afterward. He was the author of "Adventures of an Officer in Runjeet Singh's Service," and of various military and political essays, originally published in the "Calcutta Review," which were collected and reprinted in London in 1859. His life has been written by Maj. Gen. Sir H. B. Edwardes and Herman Merivale (London, 1872). **II. John Laird Mair**, lord, brother of the preceding, born in Richmond, Yorkshire, March 4, 1811. He went to India in 1829 as a cadet in the Bengal civil service, passed through various subordinate stations, and was magistrate successively at Delhi, Paniput, and Goorgaon. About 1845 he was appointed judge, magistrate, and collector in the central district of Bengal, whence he was transferred in 1846 to the chief commissionership of the newly annexed provinces beyond the Sutlej. In 1852 he was appointed chief commissioner of the Punjab. He was still at the head of affairs in that country when the mutiny broke out in 1857, and owing to his prompt and judicious measures the Punjab was one of the few parts of Bengal in which the rebellion never succeeded. He was created a baronet Aug. 16, 1858. In the same year he returned home, where he was made a mem-

ber of the privy council, and received from the court of directors a life pension of £2,000. At the end of 1863 he was appointed viceroy of India. He retired in 1863, and was created a baron, April 4, 1869. In 1870 he was elected a member of the London school board, and chosen chairman.

**LAWRENCE, James**, an American naval officer, born in Burlington, N. J., Oct. 1, 1781, died of wounds received in action, June 5, 1813. He entered the navy as a midshipman Sept. 4, 1798; in 1800 he was made acting lieutenant, and in April, 1802, a lieutenant, and served with distinction during the war with Tripoli, being one of the party which destroyed the frigate Philadelphia, Feb. 15, 1804. In February, 1805, he returned to the United States, but soon sailed for the Mediterranean again, in command of a gunboat. Soon after his arrival on the station peace was concluded, and he returned to the United States. He served as first lieutenant of the Constitution in 1808, and subsequently commanded the Vixen, Wasp, and Argus. On Nov. 3, 1810, he was promoted to the rank of master commandant, and appointed to the Hornet (18 guns), with which in the autumn of 1812 he sailed from Boston in company with the frigate Constitution, Com. Bainbridge's flag ship. In December the two ships arrived off the port of San Salvador, Brazil, where the British sloop of war Bonne Citoyenne was lying, with a very large amount of specie on board. Soon afterward the Constitution separated from the Hornet, leaving her to blockade the Bonne Citoyenne, which she did for 18 days, when she was chased off by the Montague (74), and shaped her course for the mouth of the Demerara river, making several captures on the passage. On Feb. 24, 1813, when off the mouth of the river, the Hornet fell in with the British brig Peacock, a vessel of equal size but somewhat lighter armament. After a short but severe contest the Peacock surrendered. She was found to be in a sinking condition, and before all the wounded could be removed went down with nine of her own and five of the Hornet's men. The loss of the Peacock was 33 killed and wounded, including her commander; the Hornet had but one killed and two wounded, and the ship was but little injured. She arrived at New York in March with 277 souls on board, including prisoners. Congress bestowed a gold medal upon Lawrence, and a silver one upon each commissioned officer who served under him in this engagement. In the same month Lawrence was promoted to the rank of captain, and appointed to the frigate Chesapeake, then lying at Boston. The Hornet was also placed under his orders, and it was intended that the two ships should cruise against the Greenland whale fishery. In the forenoon of June 1 the Chesapeake was lying in President roads ready for sea, and the British ship Shannon (38), Capt. P. V. Broke, appeared alone in the offing, for the express purpose of meeting her.

Capt. Lawrence felt himself impelled under these circumstances to go out and engage the Shannon, though doubtless against his better judgment. The ships were very nearly of equal force, both mounting 48 guns, long 18- and 32-lb. carronades, and their complements were probably about the same. But the Shannon was a thoroughly disciplined ship, and Capt. Broke, who had for some time contemplated meeting the Chesapeake, had been cruising and constantly exercising his ship's company, with a view to this engagement. The Chesapeake, on the other hand, had arrived at Boston two months before from a cruise, and the men had been much on shore, indulging freely in dissipation. Capt. Lawrence was almost a stranger to them, and was weak in officers. At noon the Chesapeake weighed and stood out with a moderate breeze at S. W. At 5h. 45m., when the two ships were about 30 m. from Boston light, the action was commenced by the Shannon, which opened her fire as her guns bore, the Chesapeake retaining hers until the ships were fairly yardarm and yardarm, when she fired a well directed broadside. For several minutes a severe cannonade was maintained by both ships, when the rigging of the Chesapeake was so much cut that she became unmanageable, was thrown into the wind, taken aback, and fell aboard the Shannon, the waist anchor of the latter hooking her rigging. She was now exposed to a destructive raking fire, her upper deck particularly being swept by grape and canister from the carronades of her antagonist. Boarders were ordered to be called, but the bugleman had left his post. This caused some confusion, and at this critical moment Lawrence fell with a second and mortal wound, being shot through the body. The upper deck was now left without a single commissioned officer, the others having been all killed or wounded, and the Shannon boarded and carried the ship, no regular resistance being made. This sanguinary action lasted but 15 minutes. The Chesapeake had 43 killed and 98 wounded. The Shannon had 23 killed and 56 wounded, Capt. Broke among the latter. Both ships now made sail for Halifax. Lawrence survived four days, and every respect was paid by the British officers at Halifax to his remains, and those of the first lieutenant Ludlow. Few officers enjoyed a higher professional or private reputation than Capt. Lawrence. His personal appearance was dignified and commanding. In action he evinced the utmost courage, and his last injunction as he was borne below, mortally wounded, was: "Don't give up the ship."

**LAWRENCE, Saint**, born in Rome about the beginning of the 3d century, martyred under the emperor Valerian, Aug. 10, 258. He was one of the seven archdeacons of Rome under the pontificate of Sixtus I., and had the care of the church treasury and of the poor widows and orphans. He was summoned before the prætor and ordered to surrender the treasures of the church, whereupon he brought forward

the poor and the sick under his care, and declared that they were his treasures. For persisting in his refusal to give up his charge to the Roman prefect, he was scourged and then broiled to death on a large gridiron. His heroism under the torture is said to have caused the conversion of several pagans. A church was built over his remains outside the city walls in the reign of Constantine the Great.

**LAWRENCE, Sir Thomas**, an English painter, born in Bristol, May 4, 1769, died in London, Jan. 7, 1830. While a child he drew likenesses with the pen and pencil, and when only six years old took portraits in profile of Lord and Lady Kenyon. At this time his father was the landlord of the Black Bear inn at Devizes, a fashionable resort of travellers to Bath, and the personal beauty and genius of young Lawrence were wont to excite the admiration of the guests. After a very imperfect education he began to paint, and at 10 years of age attempted such ambitious and difficult subjects as Peter denying Christ, Haman and Mordecai, and the like. In 1782 his father removed to Bath, and placed him under the instruction of Hoare, the crayon artist. Here also he found abundant employment for his pencil in executing half-guinea likenesses of visitors to the wells, thereby acquiring a mastery over the details of costume. At the age of 13 he received from the society of arts the great silver pallet, with an additional present of five guineas, for a copy in crayon of the "Transfiguration." In 1787 he removed with his father to London, exhibited in Somerset house the same year, and almost immediately became the fashionable portrait painter of the day, a preëminence which he maintained for more than 40 years. In 1791 he was chosen a "supplemental associate" of the royal academy, his age not permitting him to become a candidate for associate membership (the only instance on record in which such an honor has been bestowed), and in the succeeding year was appointed by George III. to succeed Sir Joshua Reynolds as his principal painter in ordinary. During the next 20 years commissions for portraits flowed in upon him in such abundance that he was obliged to resign all attempts at historical composition, in which he had given some youthful promise. He was generally considered the first portrait painter of the time, and the members of the royal family and almost all persons distinguished in the fashionable world, or in literature, art, science, or the learned professions, were numbered among his sitters. His portraits of beautiful women and children were particularly celebrated. While at the height of his fame he was commissioned by the prince regent to paint the portraits of the sovereigns, statesmen, and generals who had participated in the overthrow of Napoleon, in the performance of which duty he visited the congress of Aix-la-Chapelle, and thence went to Vienna and to Rome, where he painted the pope. This series of portraits, which is of unequal merit,

is deposited in Waterloo hall at Windsor. In 1820, during his absence on the continent, he was elected president of the royal academy, as successor of Benjamin West. He had some years previous received the honor of knighthood. His reputation has not wholly survived him, as, notwithstanding his facility in expressing individual character, he was inclined to an over-refinement of gracefulness, and his portraits sometimes degenerated into a mannered insipidity. His personal character was in every respect engaging, and he was universally beloved for his amiability and generosity. Although he received large sums for his portraits, his income amounting to from £10,000 to £15,000 a year, his liberal style of living and frequent pecuniary aid to brother artists prevented him from becoming a rich man. His "Life and Correspondence," by D. E. Williams, appeared in 1831. A collection of engravings from his choicest works, with biographical and critical notices, was published in London in 1845 (royal folio, 50 plates).

**LAWRENCE, Sir William**, an English surgeon, born at Cirencester, July 16, 1783, died in London, July 5, 1867. He received a classical education, and in 1799 was apprenticed to Abernethy. He became surgeon at St. Bartholomew's hospital and in other institutions, professor of anatomy in the royal college, sergeant surgeon to the queen, and a fellow of the royal society. His principal works relate to hernia and to venereal diseases of the eye.

**LAWRENCE, William Beach**, an American jurist, born in New York, Oct. 23, 1800. He graduated at Columbia college in 1818, studied law, went to Europe in 1821, and on his return to New York in 1823 was admitted to the bar. In 1826 he was secretary of legation in London, and in 1827-'8 chargé d'affaires. He then went to Paris, where he translated into English Marbois's history of the treaty of Louisiana, with an introduction and notes (Philadelphia, 1830). On his return he delivered a course of lectures on political economy to the senior class of Columbia college, which were published in 1832. He took a prominent position at the bar of New York, and actively promoted the construction of the Erie railway, being a member of the executive committee. In 1850 he removed to Ochre Point, near Newport, R. I. In 1851 he was elected lieutenant governor, and soon after became acting governor of the state; and in 1853 he was a member of the state constitutional convention. During his term as governor he exerted himself to procure the abolition of imprisonment for debt, and was instrumental in defeating the passage by the legislature of the Maine liquor law. In 1855 he published a new edition of Wheaton's "Elements of International Law," with annotations and a notice of the author, a work which he undertook on the death of Mr. Wheaton in 1848 for the benefit of the author's family, and another edition in 1863. In October, 1869, he was a member of the social



science congress held in Bristol, Eng. In 1872-'3 he delivered a course of lectures on international law before the law school of Columbian college, Washington. His more important publications include "History of the Negotiations in reference to the Eastern and Northeastern Boundaries of the United States" (New York, 1841); "The Law of Charitable Uses" (1845); "Visitation and Search" (1858); *Commentaire sur les éléments du droit international*, &c. (3 vols., Leipsic, 1868-'73); *Étude de droit international sur le mariage* (Ghent, 1870); "The Treaty of Washington" (Providence, 1871); "Disabilities of American Women Married Abroad" (New York, 1871); "The Indirect Claims of the United States under the Treaty of Washington of May 8, 1871, as submitted to the Tribunal of Arbitration at Geneva" (Providence, 1872); "Belligerent and Sovereign Rights as regards Neutrals during the War of Secession," an argument on the case of the Circassian before the mixed commission on British and American claims, under the 12th article of the treaty of Washington (Boston, 1873); "Administration of Equity Jurisprudence" (Boston, 1874); and several speeches and addresses.

**LAWRENCEBURG**, a city and the capital of Dearborn co., Indiana, situated in the S. E. corner of the state, on the Ohio river, 22 m. below Cincinnati, and 82 m. S. E. of Indianapolis; pop. in 1870, 3,159. It is the terminus of the Whitewater canal, and the point of junction of the Ohio and Mississippi and the Indianapolis, Cincinnati, and Lafayette railroads. It contains a foundery, two flour mills, two furniture factories, breweries and distilleries, three national banks, a court house, graded public schools, two weekly newspapers, and seven churches.

**LAWSON, L. M.**, an American physician, born in Nicholas co., Ky., Sept. 10, 1812; died in Cincinnati, Jan. 21, 1864. His father was a pioneer Methodist minister who had emigrated from Virginia. He graduated in 1837 at Transylvania university, where in 1843 he became professor of general and pathological anatomy and physiology. In 1847 he became professor of materia medica and general pathology in the Ohio medical college, and in 1852 professor of the principles and practice of medicine and clinical medicine. In 1854 he was appointed to the chair of theory and practice of medicine and clinical medicine in the Kentucky school of medicine at Louisville. In 1857 he returned to the medical college of Ohio as professor of the theory and practice of medicine. In 1860 he filled the chair of clinical medicine in the university of Louisiana at New Orleans; and in 1861 he again returned to the medical college of Ohio, where he remained until his death. He conducted the "Western Lancet" from 1842 to 1864. In 1844 he edited an edition of Hope's "Morbid Anatomy." His chief fame rests upon his "Practical Treatise on Phthisis Pulmonalis" (Cincinnati, 1861).

**LAWSON, John**, an American surveyor and historian, of Scottish birth. He began his surveys in 1700, but fell a victim to the jealousy of the Indians, who confounded the surveyor of their territory with those who despoiled them of it. He was captured by them while exploring North Carolina in 1712, when in company with De Graffenried, a Swiss who contemplated colonization. The latter was permitted to buy himself free, but Lawson was burned at the stake. He left one of the most valuable of the early histories of the Carolinas, entitled "A New Voyage to Carolina, containing the Exact Description and Natural History of that Country, together with the Present State thereof; and a Journal of a Thousand Miles Travelled through Several Nations of Indians, giving a Particular Account of their Customs, Manners, &c." (London, 1709). The volume is a quarto of 258 pages, well illustrated with one of the best maps of the time, and with various other engravings, chiefly in natural history. The original edition is now very rare; it was reprinted at Raleigh in 1860 (12mo).

**LAWYER**, one whose profession is to give advice and assistance in legal matters, and to prosecute and defend in the courts the causes of those who may employ him for the purpose. The designation comprehends the several classes known as attorneys, solicitors, proctors, counsellors, barristers, sergeants, and advocates, who with various privileges and in different capacities give aid in expounding, applying, or enforcing the law, or in the preparation of legal documents. In barbarous countries or under a despotism there could be little occasion for lawyers, and indeed they would scarcely be tolerated; but in civilized countries, where justice is administered in accordance with rules previously promulgated, the employment of persons familiar with these rules to assist in legal controversies those who were not, would be so natural a proceeding, that the establishment of such a practice would be anticipated as quite a matter of course. And such we find to have been the case, though the persons rendering such assistance have not always been set apart as a distinct profession, nor have they always made their legal services a means of support. In Rome the patrician was expected to assist and protect his clients and dependents by his advice, and also when needful by open pleading of their causes before the tribunals; but this soon degenerated into a practice of hiring the aid, as advocates, of such patrons as by their oratory or their social position were specially influential. Many attempts were made by law to put a stop to the feeing of advocates, but without success; and at length lawyers became a recognized class, and the opinions or responses of the most eminent of them on questions arising under the customary law were accepted as authority. (See CIVIL LAW.) In modern times lawyers have generally been

divided into two classes: 1, those who draft legal documents, institute suits, bring them to an issue by proper pleadings, and prepare them for trial; and 2, those who give counsel in legal matters, and take charge as advocates of the causes which the other class have prepared for trial. The second class is regarded as superior to the other in dignity and importance. In England and Ireland the lower class are known as attorneys when their practice is in the courts of common law, solicitors when it is in chancery, and proctors in the admiralty and ecclesiastical courts. They must be regularly admitted to practice by the courts upon an examination regarding their fitness, and are entitled to a compensation for their services from those who employ them. This compensation is according to a fee bill prescribed by law. The present requisite for an examination for admission as an attorney or solicitor is that the applicant shall have served an apprenticeship of five years with a practitioner, but this may be diminished two years if he has received a degree at one of the English universities or the university of Dublin. The second class are counsellors or advocates, and come to the bar through the inns of court. (See INNS OF COURT.) They are first called barristers, but after 16 years' admission may be advanced to the degree of sergeant. From the sergeants the higher judicial officers of the realm are chosen, and the attorney and solicitor general; and it is customary also to confer the title of queen's counsel upon eminent sergeants, who by accepting it are understood to be so far retained in behalf of the crown as not to be at liberty to take employment against it without special license. An advocate makes no stipulation for compensation, but is nevertheless expected to perform no services until a fee is paid; and when a brief is sent him in a cause, the retainer accompanies it. In the recent union of all the courts of England in one supreme court, the practitioners in all the courts are made practitioners in the supreme court. Lawyers in Scotland are known as writers, solicitors, and advocates. The last named are admitted by the faculty of advocates, and may practise in all the courts and in the house of lords. Writers to the signet are a class of attorneys having some special privileges. On the continent, as in England, lawyers are divided into two classes, the higher of which embraces the advocates, and the lower perform the duties corresponding to those of attorneys. In France the practitioners in each court form a society or college, to which admission can only be obtained by their assent; and the same is the case in other countries where the *Code Napoléon* was introduced.—In the United States, each state has its own rules regarding the legal profession; but certain remarks may be made which will be of general application. No person is at liberty to hold himself out as a practitioner of the law without being duly licensed as such by some proper court. A license granted

by the highest court in the state gives authority to practise in all the courts. In some states inferior courts are permitted to grant licenses of like effect, but generally their jurisdiction in this regard is limited to granting admissions to practice in their own courts. In most of the states, perhaps in all, any one may manage his own case in person, and in some he may by special deputation empower any one, whether admitted to the bar or not, to act for him. The English designations of attorney, solicitor, proctor, and counsellor are nominally retained, but with no corresponding division of privileges and duties between the counsellor and the others; and if in any of the states any distinction exists between an attorney and a counsellor, the latter is only an attorney who becomes counsellor, or entitled to admission as such, by virtue of his practice for a certain period of time. In most of the states, to entitle one to apply for admission to the higher courts, he must present certificates showing that he has pursued the study of the law for a prescribed period in the office of a practising attorney or in a law school; and he is then examined as to his legal attainments either in open court or by a committee of the bar, and only admitted if the examination proves satisfactory. In some states applicants are entitled to examination for admission without making any showing as regards previous studies. Practitioners in the highest courts of the several states are admitted to practice in the federal courts on motion, without examination. In courts not of record, license to practise is not required. The wig and gown which are always worn by the judges of the superior courts and the advocates in England when in the discharge of their duties, are not made use of in this country, with the single exception that the gown is worn by the judges of the federal supreme court. Lawyers, by virtue of their admission to practice, are entitled to certain privileges and subject to certain restrictions. 1. They are officers of the court in which they are admitted to practice, and are subject to summary trial and punishment as such for any misconduct in suits or proceedings therein. Their license to practise may also be revoked for specific misconduct in suits, or even for other misconduct, if of a character rendering them unfit to be intrusted with their responsible office. 2. They are exempt from service on juries, and also from arrest on civil process during their attendance upon court engaged in or awaiting the trial of causes. 3. In the United States attorneys and counsel alike are entitled to a compensation for their services, which in the absence of specific agreement as to amount will be such as evidence may establish to be reasonable. Formerly they were not allowed to engage in suits for a share of the money or profits that should be recovered in the event of success, and an agreement to that effect would now be held illegal at the common law in some of the states, while in others it seems admissi-

ble under the statutes, and in still others it is doubtful what the rule would be held to be. But reputable attorneys seldom make such contracts, and they are generally regarded as unprofessional. Fee bills, whether by statute or rule of court, are now almost unknown in the United States, except as regulating the recovery of the successful party from his opponent. 4. The relation of attorney and client is regarded as confidential. The attorney cannot as a witness be compelled to disclose any communication his client may have made to him in order to obtain his advice or assistance; and as this exemption is for the client's benefit and protection, the attorney will not even be permitted to disclose, if willing to do so, unless the client assents. But this privilege would not extend to matters foreign to the client's own business, nor to any disclosure of intended misconduct, such for instance as confiding to counsel the purpose to commit a crime; in other words, it would not extend to anything not within the reason of the privilege, which is to throw the protection of secrecy over all communications between client and attorney which are necessary or proper to put the latter in possession of the facts to enable him to give the former intelligent advice regarding his legal rights and liabilities. While the relation exists the law regards with some degree of suspicion any other dealings of the attorney with the client, and contracts between them may be set aside on the application of the client if they appear to be one-sided or unfair, on the presumption that the attorney's influence growing out of the relation has been improperly employed to obtain them.—Of the ethics of the legal profession but little can be said in this place. By the large majority of the profession a high standard is sought to be maintained, and city, county, and sometimes state societies are formed having this object chiefly in view. In the lower courts, however, a class of practitioners is met with who rely for their success upon pettifogging practices and trickery, some of whom solicit business, and especially the defence of persons accused of crime, with little or no intention to perform valuable service in return. This last class are often called "shysters." And it is not to be disguised that men of eminent ability are sometimes met with at the bar who are as unscrupulous in their practice in the higher courts as are the pettifoggers and shysters in the lower. In this country it is always understood that certain officers will be members of the legal profession, such as judges of the higher courts, masters in chancery, or commissioners performing corresponding duties, attorneys general of states, public prosecutors of counties, and the like; and it is sometimes provided by law that no other persons shall be eligible.—Until recently women have not been admitted to practice as lawyers. An application for admission in Illinois having been denied on the ground that the statutes on the subject em-

braced males only, an appeal was taken to the supreme court of the United States, where the position was taken by counsel that the decision was in conflict with the new amendments to the federal constitution. This position, however, was declared untenable by that court. Afterward a statute was passed in Illinois which permitted women to be licensed to practise, and by statute or decision of courts they may be admitted in several of the other states. Very few, however, have hitherto availed themselves of the permission. The court of claims has recently decided that women are not entitled to practise in that court.

**LAYARD, Austen Henry**, an English archæologist, born in Paris, during the temporary residence of his parents in that city, March 8, 1817. He is descended from a Huguenot family which emigrated from France after the revocation of the edict of Nantes. After spending a number of years in Florence, where he cultivated a taste for drawing, he commenced the study of law in England, but soon abandoned it to embark in a tour of exploration in the East. Leaving England in 1839, he traversed Albania and Roumelia; and after a brief residence in Constantinople he proceeded through Asia Minor to Syria, "scarcely leaving untraced one spot hallowed by tradition, or unvisited one ruin consecrated by history." Thence he went to Persia, and devoted some time to an examination of the remains of Susa, though without any important results. During this period he mastered the Arabic and some other oriental idioms, and so assimilated his habits, dress, and general appearance to those of the Arabs, that he was frequently taken for one of that race. Passing through Mosul in 1842 on his return to Constantinople, he found that M. Botta, the French consul at the former place, was making excavations, under the direction of his government, in the neighboring mound of Kuyunjik; and he accordingly directed the attention of this gentleman to the great mound of Nimrud, about 30 m. below Mosul by the Tigris, as likely to contain remains of the utmost interest to the archæologist. The distance of the place, however, and its inconvenient position, prevented M. Botta from availing himself of this suggestion, and circumstances detained Mr. Layard in Constantinople and its neighborhood for several years. He however strongly cherished the hope of exploring the Assyrian ruins around Mosul, which he had cursorily examined while passing down the Tigris in 1840; and the gratifying results of M. Botta's excavations at Khorsabad in 1843-'4 increased his anxiety to revisit the great mound of Nimrud. Sir Stratford Canning, the British ambassador in Constantinople, agreed to defray for a limited period the expense of excavations in Assyria, and Layard eagerly embraced the opportunity. Arriving in Mosul in November, 1845, he broke ground in the great mound of Nimrud on the 9th of that month; and from that period until April, 1847, with the excep-

tion of partial explorations at Koyunjik, opposite Mosul, and Kalah (or Kileh) Shergat, and occasional excursions into the adjacent regions, he prosecuted his labors assiduously at that place, bringing to light sculptures, bass-reliefs, hieroglyphics, specimens of glass and pottery, and other monuments of Assyrian civilization. His excavations were not pursued without considerable difficulty, caused by the superstition and intractable character of his Arab workmen, and the petty persecutions of the pasha of Mosul, from which he was finally relieved by a firman from the sultan authorizing him to remove the sculptures. During the progress of the excavations, through the interest of Sir Stratford Canning, the British museum advanced a small fund in aid of the undertaking; and in 1847 a number of cases of antiquities, including the colossal human-headed lions and bulls and the Nimrud obelisk, which had been floated down the Tigris to Bagdad, and there placed on shipboard, were received in England, and deposited in the Assyrian transept of the British museum. In the same year Mr. Layard returned home, and prepared his "Nineveh and its Remains" (2 vols. 8vo, 1849), accompanied by two folio volumes of illustrations and a volume of inscriptions in the cuneiform character. In 1848 he returned to Constantinople as attaché to the embassy there; and in the latter part of 1849, at the invitation of the trustees of the British museum and under their direction, he resumed the excavations at Nimrud, which were carried on for about a year, after which he transferred the scene of his labors to Babylon. The excavations at this place produced no important result; but the discoveries at Nimrud, particularly the tablets containing Ninevitic records, were of great value. Returning to England, he published the results of his second expedition, under the title of "Discoveries among the Ruins of Nineveh and Babylon, with Travels in Armenia, Kurdistan, and the Desert" (2 vols. 8vo, 1853). Upon the retirement of Lord Palmerston from the foreign office in 1851, Mr. Layard was appointed under secretary of state for foreign affairs, and soon after entered parliament as member for Aylesbury. He declined appointments under the succeeding administrations, preferring to give his attention chiefly to questions of eastern politics, and soon attracted attention in the house of commons as a debater. In 1854 he visited the Crimea, and was subsequently instrumental in procuring the appointment of the committee of inquiry into the state of the British army before Sebastopol. He declined office under the Palmerston administration of 1855, and became a member of the "Administrative Reform Association." His motion embodying the views of this organization was rejected in the house of commons in June, 1855, by a decisive vote. At the general election of 1857 he was defeated at Aylesbury, and in 1859 at York, but was elected for Southwark in 1860. He

devoted himself for some years to the preservation of the frescoes and paintings of the early Italian masters. Of these he made a series of elaborate drawings and tracings, a portion of which have appeared in the publications of the "Arundel Society." He became again under-secretary of state for foreign affairs in 1861, and retired from the office on the fall of Russell's second administration in 1866. Mr. Gladstone appointed him chief commissioner of works in 1868, and in 1869 minister plenipotentiary at Madrid, a post which he still holds (1874).

**LAYBACH**, or **Laibach**, a town of Austria, capital of the duchy of Carniola, situated on the river Laybach, near its entrance into the Save, 45 m. N. E. of Trieste, on the railway from Vienna; pop. in 1870, 23,032. The town occupies both banks of the river, which is here crossed by five bridges. Among the most remarkable buildings are the palace of Prince Auersperg, the town hall, the theatre, and the barracks. The former fortified castle on the Schlossberg, which was destroyed in 1813, has since been used as a provincial penitentiary, and now serves as a military depot and prison. The city has 11 Catholic churches, several monasteries, a Protestant church, two gymnasia, a *Realschule*, a veterinary school, a provincial museum, manufactories of linen, woollen, and silk, a large sugar refinery, and oil, paper, and cotton mills. Laybach is a place of great antiquity, the seat of a bishop, of the civil and military government of the province, and of a chamber of commerce and industry. From 1809 to 1813 it was the seat of the French government of the Illyrian provinces. A congress of European monarchs was held here in 1821 to regulate the affairs of Italy.

**LAYERING**, one of the processes in horticulture by which plants are multiplied. In the propagation of plants by cuttings, a portion of the stem is removed and inserted in the soil, where it takes root and becomes a new plant; in layering, the portion of the stem which is to form the new plant remains attached to the parent plant while the roots are forming. In the cutting there is sufficient nutriment accumulated within its stem and leaves to enable it to throw out roots, through which it can derive sustenance; but in the layer the portion that is to become a new plant is sustained by the old one until it is provided with the means (roots) of self-support. Many plants which it is almost impossible to propagate by cuttings are readily managed by layers. The operation of layering was no doubt suggested by the manner in which some plants multiply themselves in the wild state; many, as the red raspberry and blackberry, throw out stems just below the surface of the earth; these run along underground, sometimes for several feet, when the end turns up and seeks the light; abundant roots are formed, and when the connection with the old plant is severed by decay or otherwise, the new one grows on and in time

repeats the same process. This propagation by suckers, as it is called, is illustrated in fig. 1. In close imitation of this, the gardener selects a branch which starts above ground,

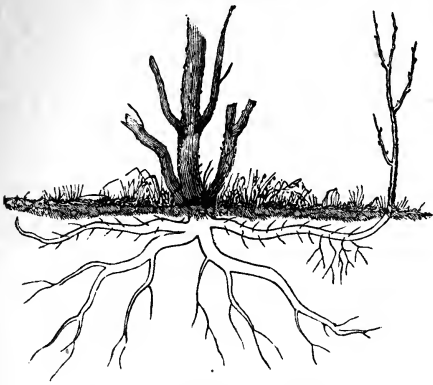


FIG. 1.—Propagation by Suckers.

and bends it down so that a portion can be buried in the soil; roots are soon thrown off by that part of the stem covered by the earth, and when these are sufficiently developed the communication with the parent is cut off. Many plants, the stems of which strike root easily, such as the wistaria and the grape, may be easily multiplied by this simple process. Other subjects are more difficult, and require special treatment. One of the common methods is to form a "tongue" on the buried-stem by cutting halfway through it in a sloping direction; the old practice was to cut the tongue on the under

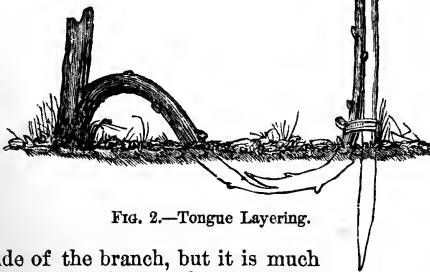


FIG. 2.—Tongue Layering.

side of the branch, but it is much better to cut it upon the upper side, as shown in fig. 2. If measures are not taken to keep this tongue open, the wound will sometimes heal, and no roots be formed; hence a sliver of wood or other matter is put in to keep the cut open; or if the nature of the plant will allow, a slight turn of the stem will separate the parts. In this method the uninjured portion of the stem serves to keep the extremity alive while roots form. The end of the stem is usually turned up and held in an erect position by tying it to a stake. Some plants thus treated will form roots in a few weeks, while others require the whole season, or even

longer, before the new plant may be removed. This kind of layering is practised on herbaceous stems (as the carnation), or upon woody stems two or more years old. Shoots of the grape of the current season, if layered as soon as the wood has become firm enough to handle, will form good plants by autumn. Very flexible vines are treated by what is called serpentine layering, in which successive portions are put below ground, alternating with other portions exposed to the air. In very moist summers florists resort to what is called "layering in the air" for the propagation of geraniums (pelargoniums); in such seasons the stems of these plants are so succulent that cuttings made in the usual way would decay before they took root; in this case the stems are tongued as if they were to be layered, but are left without contact with the soil; the cutting checks the luxuriant growth, causes the soft wood to harden, and in some seasons the cut surface will not only be calloused but even emit aërial roots. Among the modifications of layering is one employed when the stem cannot be made to reach the earth, but the

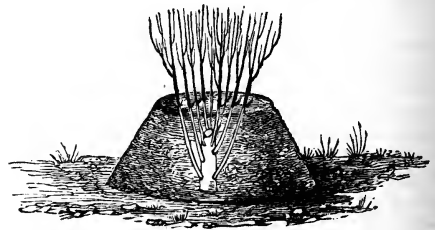


FIG. 3.—Mound Layering.

earth must be brought to the stem; a pot with a slit in the side is made to include the stem and then filled with earth; some contrivance is supplied for keeping the earth in the pot in a properly moist condition, and when sufficiently rooted the layer is detached. Mound or stool layering is largely practised by nurserymen to procure quince stocks for dwarfing the pear, and paradise and doucin stocks for dwarfing the apple. The plants when well established are in early spring cut off near the surface of the ground; numerous shoots spring from the remaining portion of the stem, which are allowed to grow during the season; in the following autumn or spring earth is heaped up around the plant so as to cover the base of these shoots for three or more inches with good soil, and this shaped to form a neat mound as shown in fig. 3; the buried bases of the shoots throw out roots into the soil of the mound, and in autumn the earth is removed, the rooted shoots severed from the parent plant, or stool as it is called, and set out by themselves; if properly managed, the stools will produce successive crops of stocks.

LAYNEZ, or Lainez, Diego, the second general of the society of Jesus, born at Almazan, Cas-



tile, in 1512, died in Rome, Jan. 19, 1565. He received his master's degree in the university of Alcalá in 1533, and in the same year went to Paris for the double purpose of completing his theological studies and of forming the acquaintance of Ignatius Loyola. (See *Jesuits*.) He was ordained priest in Venice, June 24, 1537, and in the following November was appointed by Paul III. to teach scholastic theology in the Sapienza college in Rome. He was afterward employed in a series of reformatory missions destined to check in upper Italy the spread of Protestant doctrines, and to revive faith and piety among the clergy and people. One of the results of his labors there was the foundation in 1542 of a Jesuit college in Padua. He appeared at the council of Trent in May, 1546, as one of the pope's theologians, opening and closing in this capacity every public discussion, and recapitulating the arguments on both sides. He labored during 1548 in reforming various dioceses in Sicily, founding schools, hospitals for the sick, and retreats for the aged and unprotected, as well as the college of Palermo. In 1550 he accompanied the Spanish expedition to Tunis, and on his return he was appointed provincial of his order in upper Italy. He opened the debates in the council of Trent, when it reassembled in 1551, and used his best endeavors to secure freedom to the Protestants invited to be present. During repeated attacks of fever from which he suffered, the council suspended its sessions. In punishment of a fault of insubordination which he committed in 1551, he was ordered by Loyola to compose a complete summary of dogmatic theology. The manuscript still exists in Rome, but no one has been able to decipher the writing. After the death of Loyola in 1556, Laynez governed the order as vicar general till 1558, when he was unanimously chosen general. In 1559 twelve of the cardinals had resolved to elect him pope after Paul IV.; but their purpose was frustrated by his flight from Rome. In 1561 he went by order of the pope to the conference of Poissy, and in 1562 he was present again at the council of Trent, where he took a leading part. Laynez was conspicuous for his unwearied zeal in teaching; and he used his great influence in establishing free schools, colleges, and universities, and in extending the missionary enterprises of the Jesuits. He twice declined the dignity of cardinal.—Besides the work on theology already mentioned, he left several manuscript treatises on other subjects, all of which are equally illegible. His life was written in French by Michel d'Esne (Douai, 1597).

**LAZARISTS**, a society of regular clerks founded at Paris in 1625, so called from the priory of St. Lazare, near Paris, their first official residence, but whose proper name is "Priests of the Congregation of the Mission." While St. Vincent de Paul resided as tutor and chaplain with the count de Joigny, father of Cardinal de Retz, he effected much good among

the count's numerous vassals by religious revivals, called missions in the Roman Catholic church. The countess de Joigny, wishing to have a body of such missionaries, obtained from her brother-in-law, Jean François de Gondi, archbishop of Paris, the Collège des Bons Enfants, and induced Vincent with another priest, Antoine Portail, to take possession of it in 1625, for the purpose of founding a congregation of missionary priests. Their enterprise was officially approved by the archbishop of Paris, April 24, 1626; and the missionary society was approved by Urban VIII., Jan. 12, 1632, and Vincent appointed by him its superior. A few days before this last date, Vincent was put in possession of the priory of St. Lazare in the St. Denis suburb, to which a leprosy hospital had been attached in the 12th century, and which had been till then the property of the canons regular of St. Augustine. The new congregation, which only numbered four associates in 1626, had so much increased in 1632 that they were called to labor in almost every diocese of France, and even in foreign countries. They lived together in great poverty and harmony, without being bound by any religious obligation, till Alexander VII. issued a bull confirming their society, April 18, 1655, and in a brief published in the following September regulated their constitution. This prescribes that no one can be admitted into the congregation till he has passed two years of seclusion in one of their seminaries. At the end of this period the candidate binds himself by the simple vows of poverty, chastity, and obedience, and a special vow of ministering to the spiritual needs of the poor. The associates are exempted from the jurisdiction of bishops in the interior of their houses, but dependent on that jurisdiction in diocesan ministrations. Their dress is that of the secular clergy. When the constitutions, with the supplementary rules drawn up by St. Vincent (who had in 1642 been elected by the congregation superior for life), were formally accepted, May 17, 1658, they had already formed establishments and founded missions in every Catholic country of Europe. Beginning in Rome in 1640, their successful labors among the poor of the city, the shepherds of the Campagna, and the peasants of the surrounding provinces, caused them to be called successively to Genoa, Turin, Naples, and Tuscany. Their establishments in the former kingdom of Sardinia were suppressed by the French in 1798; they were restored in 1816, but occupied none of their former houses till 1830. The establishments formed by them after that date in Piedmont and the island of Sardinia continued to prosper till 1870. They were equally prosperous in the kingdom of Naples, where they were compelled to form almost a separate organization in 1788; they reunited with the main body in 1827, and shared the fate of the religious orders in the late political changes in the peninsula. In 1646 eight Lazarists went to Ireland, and labored among the Catholics of

Limerick and Tipperary, but were compelled to withdraw after the capitulation of Limerick. Others from 1651 to 1679 ministered to the spiritual wants of their coreligionists in the Hebrides, Orkneys, and the west coast of Scotland. James II. called them to London at his accession, but they fled the kingdom in 1688. In 1795 they had a principal share in organizing the college of Maynooth, and in 1832 they opened a college in Dublin; and other establishments followed in Ireland, England, and Scotland. They were introduced into Poland in 1651 by Maria Louisa, the French queen of John Casimir; and in 1796 the Lazarist province of Poland, counting the houses dependent on it in the neighboring countries, possessed in all 35 establishments. Suppressed at that time, they were allowed to return to Russian Poland in 1816, and had seven houses there at the breaking out of the last insurrection, none of which now remain. Their six principal houses in the Austrian dominions have not been molested. In 1843 their former residence in Posen was restored to them, and in 1850 they were intrusted with the direction of the theological seminary of Cologne. From these centres they multiplied so rapidly, that they were considered the largest missionary organization in Germany when they were suppressed by the Falk laws in 1872.—Their success in Spain and Portugal and their colonies was chiefly due to the favor of the Portuguese king John V., which enabled them to extend their missionary enterprise throughout the peninsula, as well as to the Azores and to Goa. In Madagascar a Lazarist mission was opened at the French colony of Fort Dauphin, on the E. coast, in 1648. Successive relays of missionaries having succumbed to the climate, excessive hardship, and the treacherous cruelty of the natives, the mission was closed in 1674. In 1783 the Lazarists were substituted for the suppressed Jesuits in the Levantine and Chinese missions. There are now (1874) 16 Lazarist establishments in the Turkish empire, the principal of which are at Constantinople, Alexandria, Smyrna, Damascus, and Beyrout, and two missions at Urumiah and Khosrovah in Persia. To all of these are attached churches, colleges, and schools for both sexes, those for girls being always directed by sisters of charity. In the Chinese empire one of their first missionaries, Pedrini, obtained high rank at court in 1724 through his proficiency in music and mathematics, and the favor of the emperor, who had been his pupil. The controversy with the Jesuits relating to Chinese religious rites prevented the Lazarists in Europe from sending assistance to Pedrini. Those who first succeeded to the Jesuits gained even a higher position than Pedrini; but in 1820 they were involved in a general religious persecution, several of their priests were put to death, and the remainder expelled. They founded, however, a seminary at Macao for training native missionaries, and by this were enabled to estab-

lish similar seminaries in each of the eight provinces which they at present labor to evangelize in China.—In France the Lazarists have enjoyed the double popularity arising from the name of their founder and from their being, like the sisters of charity, a French institution. Before 1789, besides their numerous residences, they directed 49 theological seminaries for the training of the secular clergy. They were suppressed during the revolution, restored by Napoleon in 1804, and a hospital was given them in Paris for the establishment of a central institution and novitiate, together with an annual dotation of 15,000 francs. In 1809 their opposition to the emperor's plans of a national church caused their suppression. They were recalled by Louis XVIII. in 1816, and have continued to prosper, until in 1874 they count 24 houses in France, and two in Algeria.—In South America they owe their first establishment in 1810 to King John VI. of Portugal. They have colleges and theological seminaries at Caraça and Bahia, with residences at Rio de Janeiro, Congonhas, and Santa Catharina. They accompanied a colony of sisters of charity sent from Spain to Mexico in 1844, opened a seminary in the capital, and almost simultaneously were called to Puebla and Leon. In 1859 a residence was given to them in Monterey, and in 1860 in Guadalajara. They are at present excluded, like all ecclesiastics of foreign birth, from the territory of the republic.—The Lazarists came to the United States in 1817 with Bishop Dubourg of New Orleans, and formed successively residences at Barrens, Perry co., Mo., and St. Louis, and a college at Cape Girardeau. They soon obtained establishments in Louisiana, Illinois, Maryland, Pennsylvania, California, and New York. They now (1874) possess 14 establishments in the United States, with colleges in Brooklyn, N. Y., at Suspension Bridge near Niagara, and at Germantown, Pa., which is the central house in this country.—The total number of Lazarists in both hemispheres is at present a little less than 3,000.

**LAZARUS, Moritz**, a German author, of Jewish parentage, born at Filehne, Posen, Sept. 15, 1824. He is the son of a learned rabbi who died in 1874. He studied at the gymnasium of Brunswick, and from 1846 to 1850 at the university of Berlin. From 1860 to 1866 he was professor of psychology in the university of Bern. Returning to Berlin, he became in 1868 teacher of philosophy at the military academy. In 1869 and 1871 he was president of Jewish synods at Leipsic and Angsburg. His works include *Das Leben der Seele in Monographien* (2 vols., Berlin, 1856-'8); *Ueber den Ursprung der Sitten* (1860); *Ueber die Ideen in der Geschichte* (1865); and *Zur Lehre von den Sinnestäuschungen* (1867).

**LAZULITE**. See LAPIS LAZULI.

**LAZZARI, Donato**. See BRAMANTE D'URBINO.

**LAZZARONI** (It. *lazzaro*, a leper), the lowest classes of the populace of Naples, including porters, itinerant vendors of food, boatmen,

beggars, and all without a fixed place of abode. The name is derived from that of the beggar Lazarus mentioned in the parable of Christ. During the middle ages lepers were obliged to wear a peculiar dress, consisting simply of short drawers, shirt, and hood, and down to a recent time this costume was generally retained by the lazzaroni. At the end of the last century their number was estimated at 40,000, most of them sleeping in the open air, in archways, or in large baskets which they carried with them. Though idle, ignorant, and vicious, they are abstemious, frugal, and, when not excited, proverbial for their good nature. They used to elect yearly their chief, the *capo lazzaro*, who was formally acknowledged by the government which was better able to control the lazzaroni through him. The lazzaroni have frequently played an important part in political revolutions. They aided Masaniello in the revolution of 1647, and during the siege of Naples by Championnet in 1799 they fought bravely, their *capo* Michele being afterward appointed a French colonel. In recent times the lazzaroni have generally been identified with the Bourbon interests and reaction; the dread of their being turned loose to pillage the city having been used during the last reigns of the overthrown dynasty as an effectual check on the middle classes. Of late they have lost many of their peculiarities; efforts have been made by the government of Victor Emanuel to inspire them with a love of cleanliness and order; and they are no longer recognized as a separate class, but are enrolled in different districts, and subjected to the same police regulations as other citizens.

LE. See LEH.

LEA. I. Isaac, an American naturalist, born in Wilmington, Del., March 4, 1792. His ancestors followed William Penn from England, and were ministers in the society of Friends. At the age of 15 he was placed with his elder brother, a merchant in Philadelphia, but retained a fondness for natural objects. With Prof. Vanuxem, then a youth, he collected minerals, fossils, &c., and observed the rocks of Pennsylvania. In 1815 both were elected members of the academy of natural sciences of Philadelphia, and Mr. Lea shortly after published his first paper in the "Journal of the Academy," being an account of the minerals which he had observed in the neighborhood of Philadelphia. To a collection of minerals and geological specimens made by his own exertions, those of palæontology and recent shells were added, which at the present time have grown to great magnitude; that of fresh-water shells is entirely unequalled, the family of *unionida* alone consisting of about 9,500 selected specimens of both sexes, all ages and varieties, and of wide geographical distribution. In 1821 he joined the firm of his father-in-law, Mathew Carey, who was engaged in the largest publishing business in the United States. In 1827 he began a series of memoirs

on new forms of fresh-water and land shells, which have been continued to the present time. These were published in the "Transactions of the Philosophical Society," vols. iii. to x., and in the "Journal of the Academy of Natural Sciences," vols. iii. to vi., and separately under the title of "Observations on the Genus *Unio*," &c. (13 vols. 4to, 1827 *et seq.*; the 13th volume being prepared for press in 1873). In 1832 he visited Europe, and in 1833 published "Contributions to Geology," consisting of descriptions of 228 species of tertiary fossils from Alabama, illustrated with great exactness in colors. He retired from business in 1851, and his time has since been devoted to his favorite scientific pursuits. In all he has read 157 original papers to learned societies. In 1852 he made a second visit to Europe, and soon after his return published, in large folio, with colored plates, "Fossil Footmarks in the Red Sandstones of Pottsville," intended to illustrate the remarkable discovery made by himself of saurian footprints in the red sandstone 700 ft. below the conglomerate of the coal formation at Pottsville, and named by him *sauropus primævus*. This discovery was of great interest, as it had been believed until within a few years that no "air-breathing animal" had existed even so low as the coal measures. In another memoir he described the bones and teeth of a saurian from the new red sandstones of Pennsylvania. These constituted the first bones and teeth observed in this formation in the United States, and the animal was named by him *clepsysaurus Pennsylvanicus*. These discoveries were followed by others which have been communicated to the academy of natural sciences. Mr. Lea has contemplated the publication of a large work on the *unionida* of the United States, which is to be a complete monograph of the genera and species of that family. His memoirs published within the last 46 years are preparatory to this object. He was elected a member of the American philosophical society in 1828, and subsequently of the zoological society of London, the Linnæan society of Bordeaux, the imperial society of natural history of Moscow, honorary member of the Asiatic society of Bengal, &c. In December, 1858, he was elected president of the academy of natural sciences of Philadelphia. Among his works, besides those already mentioned, are "Description of a New Genus of the Family Melaniana" (8vo, 1851), and "Synopsis of the Family of Naiades" (4th ed. enlarged, 4to, 1870). II. Thomas Gibson, an American botanist, brother of the preceding, born in Wilmington, Del., Dec. 14, 1785, died in Waynesville, O., Sept. 25, 1844. He was engaged in mercantile affairs until his 43d year, when he retired from business and devoted himself to botany. He left an extensive herbarium with the synonymy and description of many new species, and an unfinished catalogue. A "Catalogue of Plants, Native and Naturalized, collected in the Vicinity of Cin-

cinnati, O." (8vo, Philadelphia, 1849), was prepared from his papers by Mr. W. S. Sullivant.

**III. Mathew Carey**, an American chemist, son of Isaac, born in Philadelphia in 1823. He studied chemistry in the laboratory of Prof. James Booth, and directed his attention to special branches of the science. His first published papers, in the "American Journal of Science," were a series of analyses of the coals from the various mines of Pennsylvania and Maryland. These were followed by papers on picric acid and its salts; on nitrate and nitrite of ethyl; on the ethyl and methyl ammonias, with their separation and reactions; on the germination and growth of seeds; on the platinum metals, with improved methods of separating them, &c. He is, however, best known by his papers on photographic chemistry. He made a special study of the chemical effects of light, more particularly on the silver haloids, upon which subject he published papers in various scientific periodicals. His "Manual of Photography" (Philadelphia, 1868; 2d ed., 1871) is a work of standard authority among photographers. **IV. Henry Charles**, an American author, brother of the preceding, born in Philadelphia, Sept. 19, 1825. He entered into business at the age of 17, and has been for many years at the head of a large publishing house in Philadelphia. During the civil war he organized the system of municipal bounties to encourage volunteering, and wrote much for periodicals. Since that time he has taken an active part in urging many important measures of political reform. A paper written by him at the age of 14, on the salts of manganese, was published in Silliman's "Journal." He also published papers on fossil and recent conchology, and wrote largely on literary and critical subjects. About 1857 he directed his special attention to the study of European mediæval history, and has published "Superstition and Force: Essays on the Wager of Law, the Wager of Battle, the Ordeal, and Torture" (1866; enlarged ed., 1870); "Historical Sketch of Sacerdotal Celibacy in the Christian Church" (1867); and "Studies in Church History: the Rise of the Temporal Power, Benefit of Clergy, and Excommunication" (1869). He is now (1874) engaged in collecting material for a history of the inquisition.

**LEACH, William Elford**, an English naturalist, born in Plymouth in 1790, died at San Sebastiano, Piedmont, Aug. 25, 1836. As a boy he loved to make collections of natural objects, and in 1809 he became a student at St. Bartholomew's hospital in London, then under the care of Dr. Abernethy. Before the completion of his medical studies he became known as an ardent student in zoölogy; and from Edinburgh he was called to London to fill the post of curator of the natural history department of the British museum. Here he found time to prepare papers for publication in the "Transactions" of the chief scientific societies in Europe and America. One of the first and

most important of these was that on "Crustaceology" (1813), wherein he advocated the separation of the *myriopoda*, *arachnida*, and *insecta* from the *crustacea*, which are all grouped by Linnæus under *insecta*. His other most important works were the "Zoölogical Miscellany," a serial commenced in 1814 and completed in 1817, in 3 vols., and the first division of the "History of the British Crustacea," of which 17 parts appeared. His severe labors finally so affected his eyesight and his general health that he was obliged to resign his curatorship, and to abandon to a great extent the pursuit of his favorite studies. In 1826 he visited southern Europe, where he made valuable collections of insects, which are preserved in the Plymouth institution and by the Devon and Cornwall natural history society. He died of cholera. His love of animals was excessive, and he had a peculiar faculty for subduing the most ferocious kinds. One of the most faithful and attached companions of his walks was a wolf which he had tamed.

**LEAD**, an elementary substance belonging to the class of metals, and having when pure the following characteristics: color white with bluish gray tint; lustre highly metallic; specific gravity 11.370 at 0° C., compared with water at 4° C. (Reich.); specific heat 0.03140 between 10° and 100° C., 0.03065 between -77.75° and 10° C. (Regnault), and 0.0402 between 350° and 450° C. (Person); coefficient for linear dilation for 1° C. between 0° and 100°, 0.00003005 (Calvert and Johnson), for cubic dilation 0.000039 (Kopp). Its melting point is 326° C.=619° F. (Rudberg, Person); latent heat of fusion, 5.369 (Person). The conductivity of lead for heat and electricity is expressed by the numbers 8.5 for heat at 12° C., and 10.7 for electricity, silver in both instances being 100 (Wiedermann). It crystallizes in octahedrons of the regular system. Lead is not sensibly volatile below a white heat if air be excluded, but even at this temperature it cannot be distilled like zinc. It is very soft, can be cut with a knife, and can be rolled or hammered into thin sheets. It is, however, but feebly ductile, and cannot be drawn into fine wire. Two clean and bright surfaces of lead may be united by simple pressure; tin and lead can also be united in the same way. The process seems to be one of true welding at ordinary temperatures, due to the softness of the metal. Finely divided metallic lead can also be united into a compact mass by pressure. When a pig of lead is heated near to its melting point, and then struck a sharp blow, it breaks like tin into a number of pieces having a remarkably columnar structure; the purer the lead the more columnar is the fracture. On bending cast or rolled lead no sound is emitted, as in the case of tin. When solidified and cooled slowly, lead is so soft that it can be indented with the finger nail; when melted at a high temperature and cooled suddenly, it is much harder.

It has a very low tensile strength, amounting, in the form of wire, and between 15° and 20° C., to only 3,620 lbs. per square inch when the strain is slowly applied, and 4,172 lbs. when rupture is effected suddenly. The presence of tin, antimony, and arsenic renders lead harder and diminishes its malleability; oxide of lead disseminated through the metallic lead has the same effect; copper alone does not render lead harder (Brigel). Lead gives a dull sound when struck, but if cast in the form of a mushroom it is sonorous.—*Chemistry of Lead.* The atomic weight of lead is 207 (O=16), its symbol Pb (*plumbum*). When a freshly cut surface is exposed to moist air, it becomes covered with a gray incrustation of oxide, which protects the lead from further oxidation. When very finely divided, metallic lead takes fire spontaneously on exposure to the air. At a red heat lead oxidizes readily. With oxygen it forms four compounds, the suboxide, protoxide, sesquioxide, and peroxide; the protoxide and the mixture of the protoxide and sesquioxide are of importance in the arts. The protoxide of lead (PbO) is made on the large scale by the direct oxidation of metallic lead. When lead is exposed to an oxidizing atmosphere considerably above its melting point, but below the temperature of fusion of the protoxide, the latter is obtained in the form of a yellow powder called massicot. Litharge is made in the process of cupellation (presently to be described), in which lead is oxidized at a high temperature. The oxide thus obtained is melted, and flows into a receptacle where it solidifies. The color of the resulting litharge is yellow or reddish, according as the cooling has been rapid or slow; it is composed of minute scales which have a talc-like feel; when molten, it conducts electricity. Protoxide of lead is slightly soluble in water, to which it communicates a decidedly alkaline reaction; it is soluble in acids and in alkalis; its solution in lime water blackens hair, horn, and other organic matters containing sulphur. Litharge absorbs carbonic acid from the air, and becomes partially converted into carbonate; it is used in the arts as a pigment, in the manufacture of glass, in glazing porcelain and earthenware, in the manufacture of varnishes, and in the preparation of lead compounds. Minium or red lead, as ordinarily made, is not of constant composition; it is generally expressed by the formula  $Pb_3O_4$ , and may be regarded as a compound either of the protoxide with the sesquioxide, PbO,  $Pb_2O_3$ , or of the protoxide with the peroxide,  $2PbO, PbO_2$ . It is prepared on the large scale by first oxidizing metallic lead to massicot, which is ground and levigated, and the resulting fine powder exposed to an oxidizing atmosphere on the hearth of a furnace for about 48 hours, at a temperature from 300° to 450° C., care being taken to prevent the temperature from rising sufficiently high to sinter the mass. The protoxide of lead absorbs about 1.5 to 2 per cent. of oxygen,

and is converted into a beautiful red or orange-red powder; when prepared from the carbonate or white lead it has generally an orange tint, owing to its fine division. Minium is used as a pigment and also in glass making; for the latter purpose it is preferred to litharge, owing to the larger amount of oxygen it contains, which serves to oxidize organic matters, or to peroxidize iron. Minium was known to the ancients; Pliny speaks of its being made by the calcination of white lead or ceruse, and mentions the adulteration of cinnabar with minium. Protoxide of lead forms numerous compounds with acids; the most important in the arts are the carbonate, acetate, and chromate. The carbonate, or white lead, was likewise known and used by the ancients; it owes its superiority as a pigment to its great "body" or covering power, and its opacity; it is not a simple carbonate, but a compound of hydrate with carbonate of lead, in proportions varying from 2 to 4 of carbonate to 1 of hydrate. There are three methods by which it is made on the large scale, known as the French, English, and Dutch methods; they all depend primarily on the formation of the basic acetate of lead and its conversion into carbonate. In the French method, a solution of basic acetate of lead is prepared by the digestion of litharge with acetic acid or a solution of acetate of lead, or by the action of acetic acid on finely divided metallic lead with access of air. Into this solution is forced carbonic acid gas, which precipitates two thirds of the lead, and this after settling is collected and dried. The supernatant clear liquid, which is a neutral or slightly acid solution of acetate of lead, is boiled with litharge, and the basic acetate thus formed again treated with carbonic acid. Experience has shown that it is not absolutely necessary to have the basic acetate of lead completely in solution as in the French process. In the English process, litharge, with about 1 per cent. of acetate (sugar of lead), is mixed with water to a moist mass, and exposed under constant stirring to the action of carbonic acid, when the litharge is converted with great rapidity into white carbonate. The Dutch process, which is the oldest in use, consists in exposing thin sheets of lead to vapors of acetic acid and carbonic acid for a long period. In earthen vessels are placed sheets of lead rolled into the form of a spiral; into the bottom of these vessels, but not in contact with the lead, is poured a mixture of weak vinegar and substances capable of fermentation, as yeast; a plate of lead serves as a cover. From 1,500 to 2,000 vessels thus prepared are piled together in so-called *loogen*, and surrounded with spent bark or stable litter; after six weeks the lead will be found thickly coated or entirely converted into white carbonate. The action is here substantially the same as in the other processes given; the lead is first converted into acetate, and subsequently into carbonate by the carbonic acid given off by the decomposing mat-



ters present, which also serve to maintain an elevated temperature. The Dutch white lead contains more oxide of lead and possesses more body than the French, but is said to have a greater tendency, when used as a paint with oil, to turn yellow on exposure. White lead is frequently adulterated with other substances, principally sulphate of baryta. As a pigment it has been to a considerable extent supplanted by oxide of zinc, which, though of less body, is cheaper and does not blacken when exposed to sulphuretted hydrogen. Protoxide of lead dissolves readily in acetic acid; four salts may thus be formed with varying amounts of oxide of lead, namely, the normal, sesquibasic, tribasic, and sexbasic acetate. The normal and tribasic acetates are of importance in chemistry and in the arts. The former when crystallized is generally called sugar of lead; the solution of this is used in medicine under the name of Goulard's water. The solutions of the acetate have a sweetish astringent taste, and absorb carbonic acid with avidity from the atmosphere; acetic acid also dissolves metallic lead when there is free access of air. The chromates of lead may be formed by precipitation of solutions of the acetate by a solution of bichromate of potassa; they are valuable pigments. The neutral chromate has a beautiful lemon-yellow color; the basic chromates are orange or red. Lead combines with great avidity with sulphur. Four sulphides are known to exist, of which only the protosulphide is important; it will be described further on in treating of lead ores. The best solvent for metallic lead is dilute nitric acid; it is but feebly attacked by sulphuric or muriatic acids, owing to the formation of insoluble sulphate or chloride, which protects the metal from further action by the acid. Sulphuric acid is generated in leaden chambers, and concentrated to a certain extent in leaden pans; a small quantity of lead is always taken up in concentrating the acid, which may be precipitated by dilution of the acid by water.—*Lead Poisoning.* Nearly if not quite all the compounds of lead are poisonous. In cases of acute poisoning, where a large quantity of a lead salt has been accidentally or otherwise taken, there is a metallic taste in the mouth, burning pain in the stomach, nausea and vomiting, followed by prostration and death or by chronic symptoms resulting in convalescence. Cases of chronic poisoning are very common among those engaged in smelting and handling lead, and in the manufacture and use of its compounds. Painters using lead pigments, workmen engaged in red and white lead works, in the manufacture of glazed cards, in the preparation of materials for making flint glass and glazing earthenware, and in bleaching Brussels lace, which is beaten with white lead to whiten the fibre, are especially liable to the chronic form of lead poisoning. Workers in metallic lead, as plumbers, are much less liable to the disease. It is a disputed point whether lead poisoning ever

results from working in lead mines; it may be that the sulphide of lead is innocuous, while the more rarely occurring carbonate is occasionally the cause of the disease. The susceptibility to the effects of the poison varies greatly in different persons. Some are able to follow their occupation as house painters or in manufactories of white lead without suffering materially, while an instance is on record where, after careful inquiry, a severe case of lead colic in a fishing-tackle maker could only be traced to his chewing bits of metallic lead, which he chipped off while engaged for a few days in making sinkers. Among artisans who use it in their work, lead is introduced into the system either by the air passages or by the digestive organs; it is inhaled in fine dust, or it is swallowed. In this way, carefully washing the hands previous to meals is of great importance as a preservative from its effects. Lead is often introduced into the system accidentally or as an adulteration in the manufacture of various liquors. The old name of lead colic, *colica Pictonum*, colic of Poitou, arose from the prevalence of colic there produced by its use in the manufacture of wine. Devonshire colic was traced by Sir George Baker to the use of lead in clarifying cider; the dry bellyache of the West Indies arose from its use in the distillation of rum. Many glazed articles of earthenware, when acted on by acids, give up the lead contained in their glazing. In Nos. 10 and 11 of the *Medicinische Zeitung*, published by the medical society of Prussia (1859), a case is cited of lead poisoning produced by snuff, and upon an analysis of the snuff by Höckel it was found to contain  $2\frac{1}{2}$  per cent. of lead. Snuff packed in lead foil always contains lead. The wrappings of lead foil when the package of snuff is first opened often exhibit an incrustation resembling mould, which is carbonate of lead. The lead foil is frequently tinned on one side; but this proves to be a very insufficient protection, as it is often corroded through, and the workmen are sometimes so careless as to put the tinned surface outside.—There are four distinct affections produced by lead: colic, arthralgia, paralysis, and brain disease or encephalopathy. Of these, colic is by far the most frequent, it having occurred in 1,217 of the 2,171 cases of Tanquerel des Planches (*Traité des maladies de plomb*, Paris, 1839), while arthralgia occurred in 755 cases, paralysis in 127, and encephalopathy in about 72. In chronic poisoning by lead, the skin is dry and of an unhealthy earthy color, the pulse is slow, the secretions generally are diminished, the bowels constipated, and the patient loses flesh and strength. When the gums are examined, a blue line is generally found on their free margin at its junction with the teeth, particularly the incisors; occasionally the mucous membrane lining the lips and palate has the same bluish color. If the patient be now attacked by lead colic, he is conscious of a sensation of pain and sinking, which he

refers to the centre of the abdomen. The bowels are obstinately constipated; there is constant pain in the belly, aggravated in paroxysms, and relieved or not increased by pressure. The walls of the abdomen are hard and sometimes retracted; there is often nausea and vomiting; dysuria is sometimes present, and the patient is exceedingly restless, sleepless, and anxious. Notwithstanding the gravity of the symptoms, the tongue is clean or but slightly coated, the skin cool, the pulse regular, and perhaps a little slower than natural. Left to itself, the disease is of uncertain duration, but under proper treatment it is ordinarily subdued in a few days; the patient, however, is subject to relapses, and when he remains exposed to the original cause of the complaint, the colic gradually becomes complicated with palsy, or perhaps it is terminated by a fatal affection of the brain. Where death has taken place, post-mortem examination shows no special lesion; but in this as in other varieties of lead poisoning, chemical reagents detect the presence of the metal in the blood and the tissues of the body. The following treatment adopted at Guy's hospital, London, where numerous cases of the disease are received, was contributed to Percy's "Metallurgy of Lead" by Dr. Owen Rees: "In the majority of cases an ounce of castor oil mixed with 10 drops of laudanum is given twice daily, and large hot poultices of linseed meal are applied to the belly. At night a draught, consisting of 40 drops of Battley's sedative solution (*liquor opii sedativus*) in camphor mixture, is prescribed, if the bowels have been acted upon by the oil taken during the day. In severer cases, accompanied with tenderness of the belly and retching, bleeding from the arm to the amount of 16 or 20 fluid ounces may be practised with advantage when the patient is young and strong. Pain and spasm are thereby very quickly allayed; and the stomach often loses its irritability and immediately afterward retains food and medicine. Where the patient is less robust, the application of 15 or 20 leeches to the belly followed by a warm poultice has been found to produce much relief. Castor oil with Battley's sedative solution is also given as in other cases. Clysters of this oil may be resorted to when the stomach is too irritable to retain medicine; and in all cases a pint of warm gruel injected into the rectum greatly soothes the patient." Mr. Williams states that according to his experience "no relief is obtained unless the patient is kept under the influence of opium for a few hours before giving purgatives and clysters; that while the spasm lasts the use of purgatives is futile, even clysters of castor oil being expelled without being soiled by faecal matter or tainted by faecal odor; that he begins his treatment by administering a dose of three or four grains of opium, and that in severe cases he has not seen any soothing effect from the injection of warm gruel into the rectum."—In lead arthralgia, besides the gen-

eral symptoms of chronic poisoning, the patient suffers from paroxysms of sharp, darting pains, commonly in the limbs, but sometimes in the trunk; these pains do not follow the course of the nervous cords, and they are increased by motion and diminished by pressure. In the intervals of the paroxysms the patient suffers from a sense of fatigue and constriction in the affected parts. Sulphur baths given daily for seven or eight days form the most efficient method of treatment. It would seem, according to the experiments of M. Melsens, that iodide of potassium administered internally has the power of eliminating lead from the system in cases in which it exists; and Valleix has found this remedy particularly efficacious in lead arthralgia. It may be given in doses of from 6 to 10 grains three times a day.—Lead paralysis is very rarely general; commonly it is confined to either the upper or lower extremities, and in these to one system of muscles. In five cases out of six the upper extremities alone are affected, and the paralysis is limited to the extensor muscles of the hand and wrist, the hand remaining permanently flexed, giving rise to the "dropped wrist." The muscles have lost their contractility, become wasted, and in bad cases after death look pale and as if converted into fibrous tissues. Often the paralyzed parts have more or less lost their sensibility; sometimes this loss of sensibility (lead anaesthesia) occurs independent of paralysis of movement. Lead palsy is rarely a primary affection, lead colic or arthralgia commonly preceding it. Its progress is slow, and in well marked cases the results of treatment are somewhat uncertain. The internal use of iodide of potassium for the purpose of eliminating the poison, the employment of small doses of strychnia, of electricity, and of friction to stimulate the injured muscles, are the means most to be relied upon. In all cases the disease is chronic, and the treatment requires to be persevered in for a long time.—Lead encephalopathy, brain affection produced by lead, is happily the rarest of the forms of lead poisoning. In a few cases the patient is attacked suddenly and without warning; but in the majority of instances, after the symptoms characteristic of the effect of lead upon the system are already well marked, and often after colic has supervened, the patient is attacked with headache, vertigo, sleeplessness or somnolence, frequency of pulse, and stiffness or pains in the limbs. The disease may now assume one of three forms. He may be suddenly attacked by a delirium, which in some cases is mild and tranquil, in others serious, the patient being dangerous to himself and others. In other cases he is seized with epileptiform or epileptic convulsions, in the intervals between which he only partially recovers the use of his intellect, remaining stupid and confused. Both these forms are apt to terminate in coma. In a third the patient is comatose or deeply somnolent from the commencement, neither delir-

ium nor convulsions being present. The mortality in encephalopathy is very high, more than one half of all the cases proving fatal.—Of more importance than the treatment of lead disease is the adoption of means for its prevention, and in this regard there is often much to contend with in the indifference of operatives to sanitary measures. Thorough ventilation and scrupulous cleanliness would in most instances prevent the contraction of the disease. Prophylactic remedies have been much used, those proving the most useful being drinks acidulated with sulphuric acid and milk. Cases of poisoning of animals in the vicinity of lead works are not uncommon. This subject was investigated by Dr. George Wilson in 1852, and the results were communicated to the royal society. He found the herbage in the neighborhood of a lead-smelting establishment to be impregnated with carbonate of lead, as well as the water in a stream used for washing ore. Fourteen horses and some cows died, it was believed, from the effects of the lead. Examination of the tissues of the animals showed the presence of lead in two cases, but not in the others. The lead found was largely present in the spleen. Instances have been recorded of the death of cows from swallowing the "bullet spray" scattered in target practice.—The frequent occurrence of cases of poisoning resulting from the very general use of lead pipe in the conveyance of water into dwellings, has led to investigations by many chemists into the action which different waters exert on this metal. Bright lead remains unchanged in perfectly dry air or in pure water deprived of air and protected from contact with it; but in a moist atmosphere, or in rain water, its brilliancy is soon dulled, and its surface is covered with a thin film of oxide, which adheres closely to the metal and protects it from further oxidation. The oxide, however, is partially soluble in water, and is no sooner taken up by this than it combines with any carbonic acid gas present or absorbed from the air, forming with it a film made up of silky scales of hydrated oxycarbonate of lead. More lead is then oxidized, dissolved, and converted into carbonate, and so the process of corrosion goes on. The oxycarbonate is almost insoluble in pure water, this taking up of it only about  $\frac{1}{100}$  of a grain to the gallon; and so perfectly does this separate from water, that if distilled water holding four or five grains of oxide of lead to the gallon be exposed to the air, the carbonic acid soon imbibed will cause the precipitation of silky crystals of the hydrated oxycarbonate, leaving in solution not more than one part of the metal to 4,000,000 of the liquid, or  $\frac{1}{800}$  of a grain to the gallon. But an excess of carbonic acid gives to the water the property of dissolving this carbonate of lead in the same way that it acquires also the property of dissolving carbonate of lime or limestone. So far it seems therefore that carbonate of lead is as likely to be found dissolved in water that comes

in contact with the metal, as carbonate of lime in water flowing over limestone. But the presence of certain salts in the water, even in very minute quantity, modifies materially this action. The sulphates, phosphates, and carbonates of the alkalies, and the sulphates, carbonates, &c., of the alkaline earths, or indeed any neutral salt, the acid of which can produce with lead or its oxide an insoluble compound, greatly diminish this action, even if present in the water to the amount of only four or five grains in the gallon. Bicarbonate of lime, which is almost always present in spring water, is especially remarkable for its protecting influence. The action of these salts is to form insoluble precipitates, which accumulate upon the surface of the lead, and cover it with a protecting lining. The protection is not, however, uniformly efficient, for there are certain other salts and acids which exert a contrary influence, and frequently completely overpower the beneficial effects of the first class named. Such are the chlorides and nitrates, and especially nitric and nitrous acids, in solution. These acids are generated in all waters containing decomposing animal matter, and therefore must be almost universally present to some extent. Dr. Medlock, who has given much attention to this subject, goes beyond other chemists in the importance he ascribes to the influence of these acids. The action of any water on lead, he states, is entirely due to the presence of nitrous and nitric acid, resulting primarily from the decomposition of organic matters and of ammonia contained in the water; and further, that water deprived of these acids, and of substances capable of producing them, has no action on lead, and may be conveyed with perfect safety through leaden pipes or stored in leaden cisterns. He devised a method of removing the nitrates and also organic matters from water, unless the latter be present in great excess. It was by suspending coils of iron wire or pieces of sheet iron in the water, and after a time filtering off the deposit. The iron decomposes the nitric acid, being itself peroxidized, and nitrous gas is liberated, which oxidizes the carbonaceous matters, so that they are resolved into carbonic acid and a lower oxide of nitrogen. The original paper of Henry Medlock, Esq., "On the Reciprocal Action of Metals and the Constituents of Well and River Waters," is the 24th article of vol. xiv. (4th series) of the "London, Edinburgh, and Dublin Philosophical Magazine" (1857).—The quantity of lead in solution in the gallon of water which will suffice to produce injurious effects, depends very much on the individual constitution and on the length of time that the water continues to be used. Dr. Penny, professor of chemistry at Glasgow, cites an instance of the health of a whole community being deranged by water containing only one ninth of a grain of lead to the gallon; and also quotes the conclusion of Dr. John Smith of Aberdeen, that

the limit of manifestly deleterious action would seem to be somewhere between one tenth and one twentieth of a grain. An interesting case is reported of the lead disease attacking a large number of the household of the ex-royal family of France in 1848, while they resided at Claremont, Surrey, England. The spring that supplied the palace had been selected for the purity of its water, and lead pipes had been laid 30 years previously to the palace, two miles distant. Four members of the family manifested some symptoms of poisoning after five months' use of the water, and in seven months 13 persons were alarmingly affected. The water on examination was found to contain one grain of lead per gallon. In experiments on the effect of Dantzic water on lead pipes, Dr. Lissauer found that the maximum amount of lead was present after one week's use. After the third week there was still a small amount, while after four weeks and during the six months succeeding the water was free from lead. He found further, that when the water contained 3·8 grains of carbonate of lime to the gallon the water was without effect on lead. In contact with a less oxidizable metal, lead is more readily attacked than when alone. Lead pipe is consequently found to be more corroded in the vicinity of the soldered joints than elsewhere. A notable quantity of lead has been found by Dr. Hayes in water contained in metallic ice pitchers where the sides were soldered to the bottom. A safe substitute for lead pipe for water supply has been found in the tin-lined lead pipe or lead-encased tin pipe. Careful investigation has shown that these pipes when properly made and jointed effectually resist corrosion by ordinary potable waters, although the waters of some springs and wells have been known to attack tin. As it is not probable that the use of lead pipe will be soon abandoned in cities, it is important to understand how it may be used with the least risk. The greater danger is in general to be apprehended the longer the water is allowed to stand in it before using, and the more the pipes are exposed to the alternate action of air and water as they are filled and emptied. Pipes in the upper parts of buildings are frequently left empty of water by this being drawn off below, and for this reason are more exposed to chemical action than those constantly filled. The first flow of water through any lead pipes that have been left some time without use will wash out the dissolved salts of lead. If this water is allowed to run waste to the amount of several times the contents of the pipes, that which follows is not likely to contain any injurious quantity of lead. By thus drawing off every morning the water that has stood in the pipes, and then washing them out by the continued flow for a short time, all risk of lead poisoning may be avoided.—The published information on the subject of lead poisoning and the effects of water upon lead is scattered through a vast

number of medical and chemical works and reports of sanitary committees. The most important works to consult are Christison on poisons, and L. Tanquerel des Planches on lead diseases, translated from the French by Dr. Samuel L. Dana (Lowell, 1848). Convenient reference may be had to the opinions of a great number of chemists in the "Collection of Reports (condensed)," prepared and published in 1859 by Mr. James P. Kirkwood, engineer of the Brooklyn water works; also to the "Report of the Metropolitan Board of Health" (New York, 1869), and an article by Prof. William Ripley Nichols on the action of Cochituate water upon lead pipes, in the "Second Annual Report of the Massachusetts State Board of Health" (1871). Appended to this latter article is a list of books and monographs on the subject.—*Ores of Lead.* Lead has been found in a few instances native, but such occurrences are extremely rare. The principal ore of lead is the sulphide or galena. When pure it consists of 86·6 per cent. of lead and 13·4 of sulphur. It crystallizes in the isometric system, the prevailing form being the cube; and it has a perfect cubic cleavage. Hardness 2·5 to 2·75; specific gravity 7·25 to 7·7; lustre metallic; color and streak pure lead gray. Heated in an open tube, it gives fumes of sulphurous acid; before the blowpipe on charcoal it fuses, emits sulphurous fumes, coats the coal yellow, and yields a globule of metallic lead. It is soluble in nitric acid. It occasionally contains, as impurities, antimony, arsenic, copper, zinc, and cadmium. All galena is more or less argentiferous, and also probably auriferous, but the physical characters give no indication of the amount of silver present. Generally galena occurring in true veins in the older rocks contains more silver than that occurring in deposits in the more recent formations. The following list shows the amount of silver in galenas from a few localities:

LOCALITY.	Percentage of silver.	Equal to troy ounces in a ton of 2,240 lbs.
Hartz.....	0·08 to 0·05	9·8 to 16·8
Sala, Sweden.....	0·05 to 0·75	16·8 to 245
England.....	0·02 to 0·08	6·5 to 9·8
Lead hills, Scotland.....	0·08 to 0·06	9·8 to 19·6
Monroe, Conn.....	3·00	980
Roxbury, Conn.....	1·85	544
Eaton, N. H.....	0·1	32·7
Shelburne, N. H.....	0·15	49·0
Missouri.....	0·0012 to 0·0027	0·4 to 0·9
Arkansas.....	0·08 to 0·05	9·8 to 16·8
Middletown, Conn.....	0·15 to 0·06	49·0 to 65·0
Pike's Peak, Colorado.....	0·05 to 0·06	16·8 to 19·6
Antimonial galena from Tuscany.....	0·825 to 0·72	106 to 235
Peru, undressed ore, but exceptionally rich.....	0·52 to 3·20	170 to 1183

According to E. J. Chapman, galena is seldom highly argentiferous except when associated with mispickel or other arsenical ore. Associated with galena, and generally resulting from its decomposition, are frequently found oxidized compounds of lead, as the carbonate,

sulphate, phosphate, and arseniate. In some localities these compounds are abundant, and form a considerable proportion of the ore raised. The carbonate of lead or cerussite crystallizes in the orthorhombic system, and contains when pure 77.52 per cent. of lead. It occurs both crystallized and earthy; in the latter condition it is white, if not contaminated by copper or other metals; it is the most abundant of the oxidized lead ores. The sulphate of lead, or anglesite, occurs frequently in orthorhombic crystals of great size and beauty; it contains 68.31 per cent. of lead. The phosphate or pyromorphite is found frequently in the upper part of lead veins; it occurs in beautiful green hexagonal crystals, which are composed of three molecules of phosphate and one of chloride of lead. The arseniate or mimetesite corresponds in composition to the phosphate, containing three molecules of the arseniate to one of the chloride; it occurs in yellowish crystals of the hexagonal system. All of the above oxidized compounds of lead, with the exception of the carbonate, have more of a mineralogical than metallurgical interest. Some mines are noted for the occurrence of fine crystallized specimens of these and other lead compounds. The Wheatley mine, near Phoenixville, Pa., has been one of the most celebrated mines in the world in this respect. The number of minerals occurring there is referred to subsequently. There are, further, a number of minerals containing, besides lead, other metals, as antimony, copper, and silver, which are subject to metallurgical treatment, but which are not properly speaking lead ores.—Galena is widely disseminated in nature; it is found in crystalline and stratified rocks, and occurs in veins, beds, and irregularly distributed masses. Two classes of deposits are to be distinguished: 1, those in which the galena is associated with other metallic sulphides, as silver, copper, iron, and zinc, and often combinations of these sulphides with antimony and arsenic; and 2, those in which the galena is nearly or quite free from associations with other metals. To the first class belong many of the most celebrated silver mines, as those of Freiberg in Saxony, Clausthal in the Hartz, Przibram in Bohemia, and many of those in the United States. The veins worked in these mines are generally in the older crystalline or metamorphic rocks, and usually belong to the class of true veins continuous in depth containing the metallic deposits and gangue minerals in regular bands or layers. Although the lead products of these mines may be relatively large compared with that of the other metals present, yet they would not be profitable were they worked for lead alone. The presence of lead is, however, advantageous in the extraction of the other metals, especially silver. The workable deposits of galena free from other metals are not very numerous; they are chiefly confined to England, Spain, and the United States. They

occur mainly in or are associated with limestone and dolomite, in pockets, layers, and gash veins, but rarely in true veins. The metals gold, silver, and tin are seldom found in workable veins except in the older and crystalline rocks, while lead is mostly found in unmetamorphosed and more recent rocks. In this respect it resembles zinc, with which it is often associated. "In Great Britain galena occurs in veins in palæozoic rocks, namely: in the carboniferous or mountain limestone in Cumberland, Durham, Northumberland, Yorkshire, Derbyshire, and Flintshire; in the Devonian in Devon and Cornwall; and in the lower Silurian in Shropshire." (Percy.) The mountain limestone series is made up of beds of limestone which alternate with sandstones and shales, having a thickness altogether in the northern counties of 2,000 ft., and in Derbyshire of 1,500 ft. The miners distinguish three classes of deposits: rake veins, pipe veins, and flat veins. The rake veins correspond nearly with what are called true or transverse veins, showing a comby structure and "slickensides," or polished walls; they do not, however, always descend through the strata in a regular manner, but go down by a series of vertical and oblique portions, the change of inclination being coincident with a change in the character of the rock through which the vein passes. The pipe veins are quite irregular deposits of no great length, more like what have been designated as gash veins. The flat veins are deposits formed between the layers of two adjacent beds. "As a general rule, the lodes of the limestone districts have a comparatively soft matrix; large bodies of clay, locally called 'flucan' and 'dowk,' often occupy a great portion of the original vein fissure, and these in many localities are found to alternate with portions of exceedingly pure and solid galena; while even the superficial clay, when a thick cap of that material overlies the back of the lodes, has often yielded large amounts of ore, as in the 'hushes' of the north and in Flintshire, and as most remarkably exemplified in the 'diggings' of Missouri. When the lodes, on the other hand, exhibit less of mechanical detrital matter, and are filled chiefly by crystalline deposits, the matrix consists most abundantly of calc spar, with which fluor spar and barytes are variously associated; while zinc blende, or in its absence calamine, is a general concomitant, iron pyrites comparatively infrequent, and spathic iron ore, quartz, and pearl spar, or occasionally witherite and calamine, are confined to certain districts and zones of depth. The general direction of the lodes is more or less east and west, although cases occur where some of the great 'cross courses,' or north and south veins, have in particular parts, as notably near Holywell in Flintshire, yielded large amounts of ore. The Devonian rocks ('killas') of Cornwall and Devonshire have for many years past been noted for the production of lead ores yielding a very large



proportion of silver, and the structure of the lodes themselves offers many points of high interest. They are invariably found at a greater distance from the granite bosses which form so striking a feature of these counties than the tin and copper-bearing veins, and usually in killas of a softer character. The majority of the lodes are cross courses, traceable in some instances for miles, although it seldom happens that the richly lead-bearing part has been found to extend for more than a few hundred feet, or at most fathoms, in length. The associated minerals are principally fluor spar, quartz, sometimes in a loosely granular state, often as a white hornstone, bitter-spar, zinc blende, and more rarely spathic iron ore, fahlerz, and bournonite, while the intersections with east and west veins have been marked by the occurrence of various ores of silver." (Smyth.) Other localities are the Silurian slates of Cardiganshire and Montgomeryshire, and near Shelve on the south of Shrewsbury, where the veins run east and west, and in the isle of Man, which yields a highly argentiferous galena.—In the southern part of Spain, in the mountain range of the Sierra Nevada, there are extensive deposits of lead ores, which have been mined by the Phœnicians, Carthaginians, Romans, and Moors, and are still productive at the present day; and the smelting of the immense masses of rich slags left by the Romans has been a profitable industry in recent times. The rocks of the Sierra Nevada are mainly mica, talcose, and clay schists, enclosing strata of dolomite and sometimes gypsum. The principal lead mines occur in the spurs of the Sierra Nevada, namely, the Sierra Cartagena, Sierra Almagrera, and the Sierra de Gador. "The former is composed of sedimentary rocks of the ancient transition strata, argillaceous schists, slate, mica schists forming the base of the fissured black crystalline limestones, sandstones, and conglomerates. The erupted rocks are greenish and porphyric, and they are *par excellence* the rocks accompanying nearly all the metalliferous deposits of this locality, which for the most part are in contact with schists and limestones, and extend over a large area. Although numerous veins of ore occur, yet more generally the ore exists in intercalated beds and irregular pockets in the limestones. In the districts of Almazarron the erupted rocks are traversed at many points by veins of galena, which would indicate that the ore is of later date than those rocks. There are two classes of ore, carbonates and galenas, of which the former predominate. The galenas delivered to the smelters vary in produce from 15 to 60 per cent. of lead, containing from 32 to 121 oz. of silver per ton of lead produced. The deficiency of water throughout the entire metalliferous district of the south of Spain, added to the absence of all motive power, will ever render the dressing of the ores difficult if not impossible." (Petitgand, quoted by Percy.) The Sierra Almagrera consists of argillaceous

schists, passing into mica schists, without any eruptive rocks, but traversed by a number of ore veins, the largest of which is called the Jaroso. This vein is about 18 ft. wide at a depth of 180 ft., narrowing to 4½ ft. at a depth of 420 ft. It is filled principally with brown hematite, throughout which is disseminated argentiferous galena, with some blende and copper pyrites. The Sierra de Gador is the most famous of all the Spanish lead-producing localities. The plateau on its summit is literally riddled with shafts of greater or less depth, and shallow excavations. The ore, mainly galena unassociated with other metallic sulphides, occurs in pockets of variable size and extent, sometimes isolated, sometimes continuous and corresponding to the stratification of the rocks. The ore is occasionally found in dolomite, but is then not very abundant. It is most productive in a yellowish clayey mass which contains small pieces of dolomite ore, and associated with masses of galena; or the whole deposit may consist of fragments of ore and rock enveloped in clay. The Sierra de Gador was the scene of extraordinary activity during the third decade of this century, the production amounting in 1827 to 42,000 tons. This enormous production overstocked the market, and the price of lead fell to a point below the cost of production. The ore was here largely obtained from shallow excavations which were soon exhausted. Mining is still carried on, but the production is at present small. These mines seem not to have been worked by the Romans, owing to the small amount of silver in the galena.—In the United States the most important lead deposits are found in the Mississippi valley. There are two prominent localities, known as the upper and lower mines, the latter in Missouri, the former included within the bordering states of Wisconsin, Illinois, and Iowa. The upper mines have been thoroughly investigated by Prof. J. D. Whitney in connection with the geological surveys of Iowa, Wisconsin, and Illinois, and the results of his studies are to be found in the published geological reports of these states. The following description is taken from these reports. The extent of this lead-producing region is about 4,000 sq. m., of which about 2,200 sq. m. is in the state of Wisconsin. The most productive portion of the region is that which lies between Dubuque, Galena, and Shullsburg, so that Iowa and Illinois raise more lead in proportion to the area over which mining operations have been conducted than Wisconsin does. A circle of 4 m. radius, with its centre a little N. E. of Galena, would include nearly all the productive diggings, with the exception of those at Apple river and in the vicinity of Elizabeth. It is probable that these mines were not worked by the aborigines. Fragments of galena have been found in the ancient mounds of the northwest, but no metallic lead. The discovery of lead ore in this region is attributed to

Le Sueur, who made a voyage up the Mississippi in 1700 and 1701, for the purpose of discovering ores. The first mining seems to have been done by Julien Dubuque, a half-breed Indian, who in 1788 settled on the site of the city which bears his name, and continued until his death in 1809. The land occupied by him was relinquished to the United States by the Indians in 1832. Leases were first issued by the government in 1822 (under the act of March 3, 1807), but mining did not become general till 1826-27. Owing to the difficulty of collecting rents, a resolution was adopted in the house of representatives in February, 1839, providing for the survey and valuation of these lands, with a view to their sale. This survey was made by Dr. D. D. Owen, with the aid of 139 assistants, in the autumn of the same year, and the report was transmitted to the land office in April, 1840. In 1847 the mineral lands were thrown open for entry and purchase. From records kept at Galena by Capt. Beebe and others, it appears that the amount of lead annually produced by the mines of this region increased from 5,000 to 10,000 tons (of 2,240 lbs.) between 1829 and 1839; after that it rose rapidly, and attained its maximum from 1845 to 1847; when it reached nearly 25,000 tons. Since that time the production has materially declined, and no trustworthy record of its amount is obtainable. A notable feature of this lead region is the entire absence of drift, although the country surrounding it on all sides is covered by gravel, pebbles, and bowlders, showing that the surface has not been covered by water since the earlier geological period, and certainly not during the quaternary period or that of the drift. Geologically, this district belongs to the lower Silurian. Resting upon a floor of crystalline slaty quartzose and granite rocks is the lower sandstone, the equivalent of the Potsdam of New York, from 300 to 500 ft. thick. Above this sandstone, and passing into it by alternating beds of silicious and dolomitic material, is the lower magnesian limestone, the equivalent of the calciferous sandstone of New York. It is nearly pure dolomite, heavy and compact, with a thickness of from 250 to 300 ft. It is slightly metalliferous, but no profitable mining for galena has ever been carried on in it. The next layer is the upper or St. Peter's sandstone, a purely silicious rock of but slight coherence; its thickness is 80 to 100 ft. Next in order come the buff and blue limestones. The former, allied to the birds-eye and Black river limestones, is a dolomite from 15 to 25 ft. in thickness, containing 10 to 25 per cent. of insoluble matter. The latter, the equivalent of the Trenton limestone, occurs in beds 20 ft. thick, and is the first group of strata in the series, as developed in the northwest, in which there are any purely calcareous beds, one of the divisions being a pure limestone with but a trace of magnesia; this blue limestone is decidedly metalliferous. The next formation containing the deposits

of galena was formerly called the upper magnesian limestone; but as the term originated in a misapprehension of the geological structure of the district, it has been superseded by the more appropriate name of the Galena limestone. This formation is a thick-bedded, light gray or yellowish gray dolomite, nearly chemically pure, distinctly crystalline in its texture, and usually rather granular, although occasionally quite compact; its maximum thickness is from 250 to 275 ft.; the middle portion is marked by an abundance of flints arranged in parallel layers. Next above the Galena limestone is the Cincinnati group, composed chiefly of argillaceous and silico-argillaceous shales, with a small amount of calcareous and magnesian carbonates; its thickness is from 60 to 100 ft. Above the Cincinnati group follows everywhere in the lead region and its vicinity the Niagara limestone, a heavy mass of pure dolomite, the third in order, containing like the Galena limestone silicious nodules or flints, especially in its middle and lower portion, arranged in layers parallel to the stratification. The thickness of the formation is undetermined; 350 ft. is given as an approximation. The outcrop of the Niagara limestone forms a marked feature in the topography of the lead region, since, owing to the peculiar denudation which has taken place in the district occupied by these rocks, it is left in abrupt and picturesque bluffs or cliffs along the principal streams. It also caps the mounds or outliers of rock which, severed from their original connection, stand like sentinels posted for observation. The lead occurs in the Galena limestone in the form of sulphuret or galena, filling either partially or entirely fissures and cavities in the rock. The fissures are confined to the one formation, and are hence not true veins, but are distinguished by the name of gash veins. The principal forms of occurrence are the vertical and flat crevices or sheets, and the expansion of these crevices into pockets, openings, and caves. The crevice openings and cave openings are mostly confined to the upper portion of the Galena limestone, and the flat sheets and flat openings to the lower portion. The latter is the only form of deposit which is found to any extent in the blue limestone. The vertical sheets are generally solid masses of ore, unaccompanied by gangue or veinstone, while the flat sheets are generally associated with blende, calamine, and pyrites. The longitudinal extension of a vertical sheet of ore varies from a few yards to 100 yards, and its vertical extension from 20 to 40 ft. The greater the length and width of the sheet, the more likely it is to pass into some other form, and lose its simple sheet character. One instance has been noticed of a continuous sheet of ore 140 ft. in depth. It is from the openings or caves that by far the greater part of the ore is raised. These are not generally filled with solid ore, but are partially filled with a mass of loose material, consisting of ore and

dolomite in fine particles, the result of the disintegration of the rock, and infiltrated clay. The sides of these openings are often covered with large and beautiful crystals of galena. An exceptionally large cave in the vicinity of Dubuque was 123 ft. long, 40 to 50 ft. wide, and 20 to 30 ft. deep, and when first opened was found half filled with detritus. The decomposition and disintegration of the upper layer of the Galena limestone gives rise to surface ore, the galena being distributed in the clayey loam of the prairies. It is called float mineral, and generally indicates proximity of mineral-bearing crevices. Some openings are noteworthy for their extraordinary productiveness. The Longworthy crevice, which has been worked in different places along a line of nearly three fourths of a mile, has produced, it has been stated, about 10,000,000 lbs. of ore. Several other cavities have produced from 2,000,000 to 4,000,000 lbs. The origin of these crevices seems to be due to the same cause by which what are called joints by geologists have been formed in almost every variety of rock occurring in large homogeneous masses, and especially where they have a decidedly crystalline texture. In the dolomitic rocks of the lead region we have all the conditions which usually occur in the formation of a well developed jointed structure. It is a marked feature of the district that the fissures have approximately an E. and W. and N. and S. direction, a fact which is everywhere recognized by miners, and which is of great practical importance. All through the mining district the heaviest diggings, with but few exceptions, will be found in crevices varying but little from E. and W. in their general direction. The N. and S. fissures, on the other hand, are usually much less important, as they are generally in sheet form or their bodies wedged in close between walls of solid rocks, and do not extend into openings. It is probable that the E. and W. course of the principal crevices has been determined by the fact that this is the direction of the axis of upheaval by which the whole lead region has been slightly elevated along the N. boundary of the district, and which will be seen to have determined the draining of the region. The axis of upheaval may have determined the course of the main set of fissures, while the tendency of all masses of rock thus situated to the formation of a subordinate set nearly at right angles to the principal ones may not unreasonably be looked on as the origin of the norths and souths. The disposition of ore in the fissures is due, according to Prof. Whitney, to precipitation of the lead from the oceanic waters, from which the rocks themselves were thrown down, by means of organic matter, either directly, by the reduction of the sulphates to sulphides, or by the generation of sulphuretted hydrogen by the decomposition of the organic matter, and the subsequent conversion of the metal into sulphide. The theory of the injection of the mineral masses from be-

low is untenable, owing to the entire absence of continuation of the crevices into the underlying strata. The cause of the abundant mineral deposition in the Galena limestone, while in the lower strata it is very slight, is doubtless due to the increase of animal and vegetable life during this period, as the fossiliferous character of the blue limestone abundantly proves. The galena from this region is of great purity, and contains but a trace of silver.—The lead deposits of Missouri may be divided into three districts, the southwest, the middle, and the southeast. The latter, by far the most important, are embraced in an area 5 m. in width and 100 m. in length. They were discovered and first worked in 1720 by Renault and his mineralogist La Motte, who came out with a large party under authority of a patent granted by the French government to John Law's famous company. Mine La Motte and the Potosi lead mines were discovered and opened by them; little however had been done up to Renault's return to France in 1742. The only smelting of the lead ores appears to have been done on log heaps, a wasteful process, much practised even of late years. In 1798, as stated by Schoolcraft in his "View of the Lead Mines of Missouri," p. 19, Moses Austin of Virginia, having obtained a grant of land from the Spanish government near Potosi, sunk the first regular shaft, and erected a reverberatory furnace, and also a shot tower. According to the same authority, there were 45 mines in operation in Missouri in 1819, giving employment to 1,100 persons; in 1811 Mine Shibboleth produced 3,125,000 lbs. of lead from 5,000,000 lbs. of ore. From 1798 to 1816 Mine à Burton and the Potosi diggings were estimated to have produced over 500,000 lbs. annually; and from 1834 to 1837 the production of Mine La Motte is rated at an average of 1,035,820 lbs. of lead per annum. For 14 years succeeding 1840 Dr. Litton in his state geological report makes the annual average of all the mines over 3,833,121 lbs. The lead ore is mainly confined to the third magnesian limestone, which is nearly a pure dolomite. No workable lead deposits have been found either in the overlying or underlying strata. Beneath the limestone, throughout this region, porphyries are found which are older than the Silurian limestones, and belong, according to Pumpelly, to the azoic formation, of which they may be the youngest member in Missouri. They are the near equivalents, in point of age, to the great iron-bearing rocks of Lake Superior, New Jersey, and Sweden. Various other ores are found associated with the galena, as the carbonate of lead, sulphuret and silicate of zinc, iron and copper pyrites, and at some of the mines, as Mine La Motte, ores of manganese, nickel, and cobalt. The surface of the country in the lead region is strewn with crystallized quartz derived from the lead-bearing rocks, and called by the miners "mineral blossom." The modes of occurrence of the lead ore are gener-

ally the same as those already described as common to the northern mines. The openings on the vertical fissures vary from the capacity of a cubic foot to 10 or 12 ft. square, and when very small are called pockets. They do not preserve a uniform course, but connect one with another by passages filled with material different from the walls, and extending toward every point of the compass. Vallé's mine in St. François co. and Perry's on its extension S. present a remarkable network of veins spread over an area of about 1,500 ft. in length by 500 in breadth, ranging N. W. and S. E. They are also examples of mines of a more permanent character than are found in the northern lead region. Vallé's mine was discovered in 1824, and it is believed has been worked ever since without interruption. Three series of caves are found, the second set 18 or 20 ft. below the first, and the third about 8 ft. below the second. The middle set has been most worked. They run out in every direction, and in some instances communicate by chimneys with the series above or below. They are filled with clay, loose rock, and ore, the last often an intermixture of galena and silicate and carbonate of zinc, which requires roasting and washing to prepare it for the furnace. Dr. Litton was of opinion that three fourths of all the lead obtained in Missouri had been from clay diggings overlying the rock. These operations have often been highly productive, but were carried on without system and without capital by men who had no interest or ability to prosecute the work in the rock, and thus the more permanent deposits have been passed over. In some localities in Missouri lead has been found in the coal measures, and has been worked in the sub-carboniferous limestone. In Moniteau co. a bed of dense cannel coal 40 ft. thick is traversed by a network of veins crossing at all angles filled with galena, zinc blende, and calc spar.—There are numerous deposits of lead ore in the Atlantic states, but none of them have as yet proved to be of economic importance. (See Whitney's "Mineral Wealth of the United States.") In the belt of metamorphic rocks which extends along the S. E. flank of the Appalachian chain, there are a number of lead veins, many of which have been worked, but subsequently abandoned, owing to the small quantity of the ore, or the difficulty of separating it from the associated minerals, or the expense of mining in hard rock. As some of the deposits are highly argentiferous, it is not improbable that work on them may be resumed with profit at some future time. Among the localities best known in the New England states may be mentioned Shelburne, Eaton, and Warren in New Hampshire, Northampton and vicinity in Massachusetts, and Middletown and Plymouth in Connecticut. Some of the ore from the Shelburne mine gave 84 oz. of silver to the ton of lead, and from the Warren mine 60 to 70 oz. to the ton. The mines in the neighborhood of Northampton, Mass., were

worked as long ago as 1765. The vein here is extensive and well defined, but is not very productive, and owing to the expense of mining work on it, though often resumed, has been as often abandoned. At Middletown, Conn., the existence of lead ore was probably known in 1651, when a license was granted to Gov. John Winthrop to work mines of this and other specified mineral productions, with particular reference to any he might discover near Middletown. There is no tradition of the time when the mine was first worked. The ore is highly argentiferous galena, but not abundant. Shipments made to England yielded 25 to 75 oz. of silver to 21 cwt. of lead; and what was remarkable, a peculiar fine-grained variety of the ore, such as is usually found to be most argentiferous, proved to be only one third as rich in silver as the coarsely cubical ore. The vein consists chiefly of quartz, often in crystallized plates or combs, with some calc spar, sulphate of baryta, and fluor spar, also blende and iron and copper pyrites. It is from 10 in. to 3 ft. in thickness, and is included in silicious and micaceous slates, with the dip and direction of which it appears at the surface to coincide. Active operations at this mine have long since ceased. In Dutchess co., N. Y., explorations were made for lead in 1740, and during the revolutionary war the committee of public safety sought to obtain supplies there. Veins of argentiferous galena are found also in Columbia, Washington, and Rensselaer cos., but have never proved productive. They traverse the strata near the junction of the metamorphic slates and limestones. The principal one is the Ancram or Livingston mine in Columbia co. On the other side of the Hudson river lead mines have been worked at various localities in the unaltered Silurian limestones and sandstones; but these, too, have all been abandoned as unprofitable. The most productive among them were in the Shawangunk grit of Ulster co., which overlies the Hudson river slate group. On the W. slope of the Shawangunk mountain, at Ellenville, several nearly vertical veins have been followed into the hard sandstone, the strata of which and the direction of the mountain ridge they cross nearly at right angles. The principal one of these yielded in 1853 galena which produced about 459,000 lbs. of lead, and 60 to 70 tons of pyritous copper, 50 tons of which produced 24.3 per cent. of metal. The vein was unlike the true veins of the metamorphic rocks, having no gangue or veinstones, but wherever productive filled between the walls with rich galena and pyritous copper, the former sometimes being 5 ft. thick unmixed with other matters. In places it contracted to a knife-edge seam in the hard sandstone, and again opened out in hollow fissures, one of which, extending to more than 100 ft. in depth, with an equal horizontal range, has never been completely explored. It was partially filled with tough yellow clay, in which were imbedded loose frag-

ments of sandstone, magnificent bunches of quartz crystals, and lumps of lead and copper ores; and its walls were also lined in places with the same ores. In these features a striking resemblance is exhibited to the "openings" in the western lead mines, although found there only in limestone. The vein is moreover like those of the western mines in lacking veinstones, and probably also in being limited to certain rock formations, beneath which it will not prove productive.—In Chester and Montgomery cos., Pa., near Phoenixville, is a group of lead and copper mines, in a small district of only 5 or 6 m. in length by 2 or 3 in breadth, some of the remarkable productions of which have already been noticed. They occur in gneiss and the red shale and sandstone of the middle secondary, cutting the strata in direction and dip. Nearly all the veins, of which there are 12 or more, are parallel to each other, directed N. 32°–35° E. and dipping steeply S. E. When confined chiefly to the gneiss, they produce as a general rule lead ores; when included in the red shale, their principal product is copper ores. Quartz and iron pyrites make up the larger part of the lodes, the latter in the upper portions of the mine decomposed to a soft brown gossan. This material sometimes yields 10 oz. of silver to the ton. Prof. H. D. Rogers, from whose "Geology of Pennsylvania" these data are obtained, enumerates the following large variety of metallic constituents of the Wheatley lode, besides the gangue of quartz and sulphate of baryta: of lead—sulphate, carbonate, phosphate, arseniate, molybdate, chromate, tungstate, chromo-molybdate, arsenio-phosphate, sulphuret, and antimonial argentiferous; of zinc—sulphuret, carbonate, and silicate; of copper—native metal, sulphuret, black oxide, malachites green and blue; of iron—the oxide containing silver, pyrites, brown spar, and hematite; native silver; black oxide of manganese, and native sulphur. Gersdorffite, or sulph-arsenide of nickel, has also been found. This mine was opened in 1851, and up to September, 1854, had produced, according to the manager's report, 1,800 tons of lead ore, principally phosphate, estimated to yield 60 per cent. lead. The Chester county mining company commenced operations in 1850 in the same vicinity, and up to November, 1851, had smelted 190,400 lbs. of dressed ore, almost exclusively phosphate, which produced about 47 per cent. lead. Dr. Genth found this kind of ore to contain 1·6 oz. of silver in 2,000 lbs.; the coarsely granular galena gave 16·2 oz., and the radiated and finely granular galena 11·9 oz. Operations ceased at these and the other adjacent mines in 1854 and 1855.—In S. W. Virginia and E. Tennessee many lead mines, not in the metamorphic belt, but in the great Silurian limestone formation of the valley of Virginia, have been worked with greater or less success for many years past, their ores being compact and crystallized carbonate of

lead as well as galena. Those belonging to the Wythe union lead company on New river, Wythe co., Va., are known to have been productive in 1754, and are still worked. All the mines of this region resemble in their geological associations and metallic products those of the western lead region.—The Washington mine, Davidson co., N. C., has attracted interest on account of its being the only mine in the United States that has produced much silver. It was opened in 1836 in the silicious and talcose slates of the gold region, and, like most other veins of the metamorphic rocks of this region, has the strike and dip of the strata. There are two parallel veins worked together, which dip steeply toward the north. They are underlaid by a granitic rock, and above is talcose slate. The mine was commenced for the carbonates of lead, which were found in considerable quantity in a heavy dull ore of earthy appearance, and also in glassy crystals. Some galena and phosphate were also met with. It was not until after smelting large quantities of these ores that native silver was discovered, and the argentiferous character of the lead ores. In 1840 the display of native silver in arborescent forms and disseminated through the magnesian veinstones was very striking, and excited expectations of great richness at lower depths; but the rich and easily reducible carbonate of lead was soon exhausted, the ore in greater depths consisting of zinc blende and argentiferous galena which presented difficulties in treatment. Till 1844 the mine continued to produce largely rich argentiferous ores, after which the ores gradually diminished in quantity; the yield of that year is stated to have been \$24,009 of silver and \$7,253 of gold, separated from 160,000 lbs. of lead, an average of 240 oz. of auriferous silver to 2,000 lbs. In 1851 the production was 56,896 lbs. of lead and 7,942·16 oz. auriferous silver, equal to 279 oz. to the ton of lead. Dr. Genth found the proportion of silver in the sulphurets very variable, running from 2·5 to 19·5 oz. to 2,000 lbs. An average sample taken from 2,000 to 3,000 tons of ore (1849) contained 45 per cent. of zinc, 21 per cent. of lead, and about 8 oz. of silver to the ton, with minute quantities of copper and gold. In 1852 mining operations were stopped as unprofitable, but were soon after renewed, and have since been continued intermittently. The mine was actively worked during the civil war by the confederates for lead. In 1871 it was 650 ft. deep, and produced about 400 to 500 tons of ore per month, part of which was slaty and required dressing.—There are numerous well developed lead veins in the azoic of northern New York. The most important are those of Rossie in St. Lawrence co., which are particularly famous for the magnificent crystallizations of calcite and galena. Although occurring in the older rocks, the galena is almost entirely free from silver. The Coal Hill vein, 2 ft. wide, in gneiss, was worked with great activity in 1837 and



1838; during these years 3,250,000 lbs. of lead were smelted. The mining was however so recklessly conducted, being directed solely to the richest masses, most easily reached, that the abandonment of the mine became necessary in the following year. Argentiferous galena occurs in the sub-carboniferous limestone of Kentucky, but mining operations, which have hitherto been very imperfect and superficial, have not been productive. According to Owen ("Kentucky Geological Survey"), the most favorable localities for development of lead mines in this formation, judging by analogy with English mines, are in Crittenden and Livingston cos. Lead also occurs in the blue limestone formation of central Kentucky. A vein 4 to 6 in. wide in Franklin and Woodford cos. has been somewhat worked, but did not prove profitable.—*Metallurgical Treatment.* Ordinarily the ores as they are raised from the mine have to undergo a process of preparation or dressing, to free them from adhering gangue, or to separate the different metallic minerals before they are ready for smelting. The character of this dressing will differ according to the amount and nature of the associated minerals. Simple breaking and hand sorting often suffices to separate masses of nearly pure galena, while the fine ore and that composed of an intimate mixture of a number of minerals is submitted to various mechanical processes, by which the different minerals are separated according to their specific gravities. The processes employed for the extraction of lead from galena are three in number: 1, the roasting-reaction or air-reduction process; 2, the roasting and deoxidizing process; and 3, the iron-reduction or precipitation process. In cases where oxidized ores are smelted, the second process is employed, with the omission, of course, of the roasting. The first process depends on the interesting reaction which takes place when sulphide of lead is heated either with sulphate or oxide of lead, resulting, when the oxygen and sulphur are present in the mixture in the proportion of two molecules of the former to one of the latter, in the production of metallic lead and sulphurous acid gas. Where this proportion does not exist, a residue will remain, consisting of the excess of oxide or sulphide, as the case may be. The reaction is shown in the following equations:  $PbS + 2PbO = Pb_3 + SO_2$ , and  $PbS + PbO, SO_2 = Pb_3 + 2SO_2$ . When therefore galena is partially roasted so as to form a certain amount of sulphate or oxide of lead, and the oxide thus formed is heated in intimate mixture with the unaltered sulphide, metallic lead at once separates. This reaction takes place to some extent when galena is placed on the top of an ordinary fire; it is in this way that the backwoodsman often obtains his lead for bullets. Galena has indeed been smelted on the large scale, in localities remote from civilization, by simply throwing it upon a fire of logs. In the second process the galena is roasted,

either completely or nearly so, and the resulting oxide, with some sulphate, reduced in a shaft furnace by the carbon of the fuel. In the third process advantage is taken of the superior affinity of sulphur for iron at high temperatures, so that galena heated with metallic iron is reduced to metal with the formation of sulphide of iron. The selection of the process for the treatment of lead ores depends largely on the presence or absence of other metals, and on the richness of the ores. Where galena alone is treated with but small amount of earthy matters, the roasting-reaction process is generally employed, and the smelting is performed either on an ore hearth or in a reverberatory furnace. During the early part of the last century the ore hearth was almost exclusively used in England; it is now mainly confined to the north of England, Scotland, and the United States. The American ore hearth, a modified and improved Scotch hearth, is used in the western lead regions, and was formerly extensively used in the state of New York. It consists of a working plate of cast iron about 3 ft. wide and 2 ft. from front to back, sloping downward and forward about 1 inch in 12. It has a diagonal groove on its upper surface for the flow of lead from the hearth to the cast-iron pot. Enclosing the back half of this working plate on three sides is a hollow casting 14 in. high, forming an air chest, through which the blast passes before it reaches the hearth; this arrangement serves the double purpose of keeping the cast-iron sides cool and heating the blast. The tuyere is on the back plate about 2 in. above the level of the hearth bottom. The operation is an extremely simple one. The fuel used is light wood or charcoal, and the mass of ore and fuel fills up the hearth and slopes down to the front, which is open. Fuel and ore are added in small quantities at short intervals, and the operation is continued uninterruptedly. The lead accumulates at the bottom of the hearth, and flows out in the groove in the front of the working plate. The yield is dependent to a considerable extent on the skill of the smelter in charging and stirring the mass. At the Rossie works in New York, now abandoned, the average yield of each hearth for 24 hours was about 7,500 lbs., with a consumption of wood per day of three fourths of a cord; the direct yield of lead amounted to 70 to 80 per cent. of that in the ore. There is also a considerable quantity of slag formed, which is subsequently treated in a low blast furnace. The great loss of lead, both mechanically and by volatilization in the ore hearth, has led to the general substitution of the reverberatory furnace in the roasting-reaction process. The chief advantage of the ore hearth is the small expense for plant and the simplicity of the manipulation. In the reverberatory furnace process, called also the English process, the same reactions are involved, but they are effected on a much larger scale, and are much

more completely under control. The process as conducted in Flintshire is as follows: The hearth of the reverberatory, which is about 11 ft. long with an average width of 9 ft., is generally concave, and slopes toward the "well" about the middle of the front side. The charge, 21 cwts. of ore, is evenly spread over the furnace, and stirred for two hours with an ample supply of air at as high a temperature as possible without causing sintering. The fire is then increased until the charge becomes semi-liquid, and any portion of it which may have run down toward the well is raked back to that which remains on the upper part of the hearth. The temperature is then lowered until the charge becomes thick, when it is pushed back toward the bridge and back part of the furnace. The fire is again raised, and the charge melted down as quickly as possible into the well, when slaked lime is thrown in and raked over the surface of the melted mass. The slag and reduced portions, being thus rendered sufficiently stiff, are again thrown up or "set up" on the sloping sides of the bed, there left to cool a little, and again remelted. Lime is again added, and the slag is pushed back from the surface of the lead, and left to drain a little, when the lead is tapped off from the well into a receptacle below. The slag is run or drawn out of the furnace in pasty lumps, and is termed "gray slag." The quantity of fuel per charge varies, according to the ore used, from 12 to 16 cwts. The ores treated contain from 75 to 80 per cent. of lead, and the yield is about 14½ cwts. of lead from a charge of 21 cwts. Of this yield 91 per cent. is obtained direct from the furnace, and 9 per cent. from the slag and fume. There are numerous variations in the manipulations practised at different works, but in its essential features the process is everywhere the same. It is necessary that the ores should be rich and not contain more than 5 per cent. of silica. It is evident that where oxidized ores are available in sufficient amount to mix with the galena, the preliminary roasting may be much abridged, or even omitted. The gray slags from this process are rich in lead (over 50 per cent.), and are treated by themselves in low blast furnaces, where reduction is effected by the fuel alone; the lead thus produced is known as slag lead. The roasting-reduction process and the precipitation process are never employed for pure rich lead ores, but are confined to ores poor in lead or those containing other metals, as copper, antimony, and nickel. The roasting-reduction process may be conducted in a great variety of ways. The roasting, which is generally effected in reverberatory furnaces, may be partial or complete. Partial roasting is resorted to where the ore contains, besides lead and silver, the metals mentioned above. In the subsequent smelting of this partially roasted ore there is produced, besides lead containing the greater part of the silver, a regulus containing sulphur, iron, lead, and copper. Where arsenic, nickel, and cobalt are

present, there is also formed a *Speise*, which contains these metals combined with iron. But where other metals than lead and silver are not present (iron and zinc excepted), the ore may be roasted completely ("sweet"), the heat being carried sufficiently high to sinter the mass and convert the oxide of lead into silicate. This agglomerated roasted mass is smelted in a shaft furnace, with the addition of iron, either metallic or as oxide, in order to effect the complete decomposition of the silicate of lead. In case the roasting has been effectual and all the sulphur driven off, no regulus is formed. Examples of this latter mode of treating lead ores (*i. e.*, complete roasting) are found at Pontgibaud, Vialas, and La Pisè in France, and at Bleiberg, Rhenish Prussia; of the former (*i. e.*, partial roasting), at Sala in Sweden, and Freiberg in Saxony.—As the smelting process at Freiberg is a good example of an intelligent metallurgical practice, involving the extraction of a number of metals, a brief outline of the process will be given. The ores smelted there are divided into five classes: A, *Glanze*, or bright lead ores, containing about 30 per cent. of lead; B, *bleiische Erze*, or leady ores, containing from 15 to 29 per cent. of lead; C, *Dürrerze*, or dry ores, consisting chiefly of veinstuff with small quantities of pyrites and galena, containing from 0.05 to 0.1 per cent. of silver; D, *Kupfererze*, or copper ores, containing from 1 to 10 per cent. of copper, averaging 3 per cent.; and E, *Zuschlagserze*, or ores containing less than 0.03 per cent. of silver, and chiefly composed of pyrites, mispickel, and zinc blende, with some lead and copper, mixed with quartz and calc spar. The mixture for smelting consists of about 60 per cent. of A, 20 of B, and 20 of a mixture of C and D. The lead in this mixture amounts to from 34 to 38 per cent., and the silver from 0.15 to 0.18 per cent. This ore mixture is roasted in charges of 10 cwts. in a double-hearth reverberatory for 16 hours, until all but 5 per cent. of sulphur has been expelled. It is then smelted in shaft furnaces with roasted reverberatory regulus (*Rohstein*), presently to be described, lime or fluor spar, slags produced in the same process, and certain lead products, such as furnace bottoms. Silver ores of class C, when containing over 0.1 per cent. of silver, are added to the mixture without roasting. The products of this smelting are *Werkblei*, work or furnace lead, containing 0.5 to 0.6 per cent. of silver, from 0.20 to 0.60 of copper, and about 1.5 of antimony and arsenic; *Bleistein*, lead matte or regulus, or blast-furnace regulus, consisting of the sulphides of iron, lead, and copper, and containing on an average 20 per cent. of lead, 10 of copper, and 0.20 of silver, besides small amounts of nickel, zinc, arsenic, and antimony; *Speise*, a compound of arsenic and iron, containing the greater part of the nickel and cobalt of the ore mixture; and *Schlacken* or slag, consisting of silicate of protoxide of iron, containing

about 5 to 6 per cent. of lead and 0.02 of silver. The lead is refined and then enriched by Pattinson's process, and cupelled for silver. The silver is dissolved in boiling sulphuric acid and a little gold obtained. The regulus is roasted and smelted with copper ores of class D and slags rich in lead, producing a second regulus containing 30 per cent. of copper and 0.18 of silver. This operation is thrice repeated, resulting in the production of two enriched reguluses containing respectively 54 and 73 per cent. of copper. This latter is roasted "sweet" in a reverberatory furnace, and treated with sulphuric acid of specific gravity 1.5, diluted with its bulk of water, and the oxide of copper dissolved out, leaving a residue containing lead and silver, and some copper, which is added in the course of the lead smelting. The solution of the copper is crystallized to blue vitriol, and sold as such. In each of the three or more smeltings of the regulus there are also produced lead, speise, and slag, which are the subject of further treatment. The slags from the ore smelting are treated with ores of the classes C and E, in a reverberatory furnace, producing a regulus (*Rohstein*) and slag. The former, containing from 7 to 10 per cent. of lead, 4 to 5 of copper, and 0.15 to 0.20 of silver, is added after the roasting to the ore-smelting mixture, as stated above; while the slag which contains but 1 per cent. of lead and 0.0028 of silver is thrown away. The speise obtained in the various smeltings of ore and regulus is, after concentration of the nickel and cobalt, treated for the extraction of these metals. There is further produced at Freiberg a considerable quantity of arsenical preparations from the fumes of the furnace, and a small quantity of bismuth is extracted from the test in which the silver is refined. The third of the smelting processes enumerated above, viz., the iron-reduction or precipitation process, finds its best example in the upper Hartz. Here sulphuretted ores are smelted, which contain on an average from 54 to 56 per cent. of lead and 0.10 of silver at the Clausthal and Altenau works, and 62 to 64 per cent. of lead and from 0.09 to 0.10 of silver at the Lautenthal works; they contain also some copper, zinc, and antimony. They are smelted with the addition of cast iron, in such proportions that the resulting lead shall bear the proportion in weight to the lead regulus of 4 to 3 or 5 to 4. The result of this smelting is practically the same as that at Freiberg; furnace lead, lead regulus, slag, and occasionally speise, are produced, which are treated substantially in the same way as the corresponding products in Freiberg. The use of cast iron has been in a great measure superseded by that of iron-finery slags, or in the upper Hartz by slags from copper smelting in lower Hartz, which are silicates of protoxide of iron containing between 1 and 2 per cent. of copper and a small amount of silver. The reaction in this case depends on

the reduction of the iron in the slag and the subsequent action of the metallic iron thus

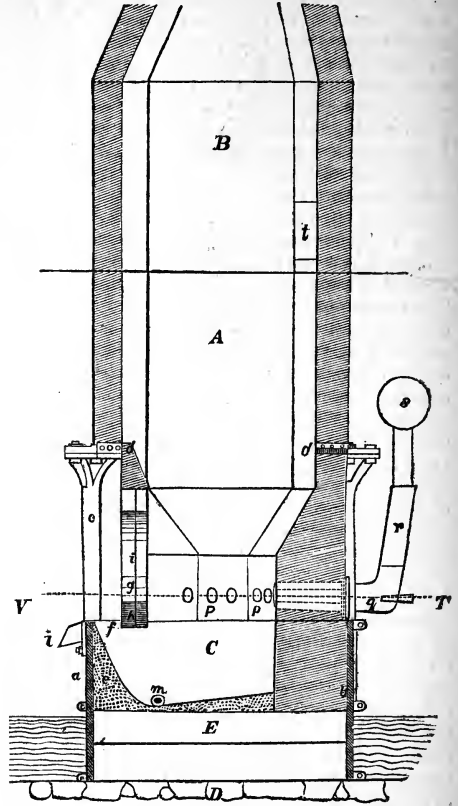


Fig. 1.

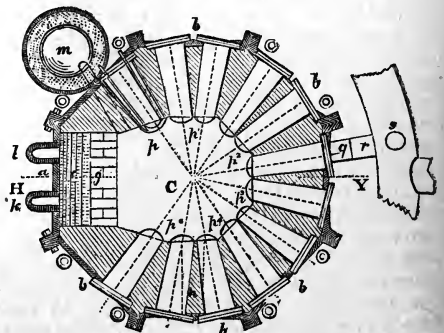


Fig. 2.

Lead Furnace.—Fig. 1. Vertical section on line H Y of fig. 2. Fig. 2. Horizontal section on plane V T of fig. 1.

A, shaft of the furnace; B, chimney; C, hearth; D, foundation; E, bottom stone; a, dam plate; b, hearth plates of cast iron; c, cast-iron pillars on which the flange d rests; e, dam; f, fore hearth; g, bridge; h, tympan stone; i, breast; k, slag sprout; l, matte spout; m, siphon tap; n, p, p', &c., tuyeres; q, nozzles; r, wind bags; s, main blast pipe; t, charging door.

formed on the sulphide of lead. The four products of lead smelting, viz., lead, speise, regulus, and slag, separate on standing according to their relative specific gravities, in the order named. The shaft furnaces used for lead smelting have been until comparatively a late period of small trapezoidal section, narrowing from the hearth to the throat, and blown with one or two tuyeres. In modern practice the furnace is generally circular in section, widening toward the mouth, and blown with eight or ten tuyeres. A marked improvement in smelting has been the result of this change in furnace construction. The yield and purity of product have been increased, and the consumption of fuel and loss by volatilization decreased. The Raschette furnace, of rectangular section and expanding walls, was introduced into the Hartz for lead smelting, with results much more favorable than the old style of furnace, but inferior to those obtained in the Pilz furnace, which differs from the Raschette chiefly in its circular section. A modified Pilz furnace has been introduced for silver smelting in Nevada, by Mr. Arendts of the Eureka consolidated works, with good results. A vertical section through the fore hearth and horizontal section through the tuyeres are seen in the accompanying figures. The hearth of the furnace is 3 ft. wide and  $4\frac{1}{2}$  ft. deep; the breast is open; the tuyeres, 12 in number, are on the sides and back of the furnace. The height of the furnace may be from 8 to 20 ft. above the tuyeres, according to the nature of the ore to be treated. Ordinarily the height is 10 ft. from tuyeres to charging opening. Mr. Arendts has also devised an automatic tap for the lead, consisting of a three-inch wrought-iron pipe in the furnace walls, one end communicating with the lowest part of the hearth inside the furnace, and the other emptying into a basin on the outside. It is said that by the use of this tap the furnace runs more regularly, the lead obtained is purer, iron sows are prevented, and the work of the smelters is lightened. (For fuller details in regard to smelting argentiferous lead in the western states, see the reports of R. W. Raymond, United States commissioner of mining statistics, and vols. i. and ii. of the "Transactions of the American Institute of Mining Engineers.")—Owing to the volatility of lead and its compounds, and to the strong draught of the furnaces used for roasting and smelting the ore, there is considerable loss of metal, as is abundantly shown by the white fumes in which lead works are often enveloped. The interception of this lead fume is of great importance both in an economical and sanitary point of view. The methods devised for this purpose may be enumerated as follows: 1, long horizontal flues; 2, condensation chambers; 3, exposure to artificial rain; 4, forcing through water; 5, intermixture with steam and its subsequent condensation. Experience seems to have proved that the most simple and effective method is the long horizontal flue,

terminating in a chimney sufficient to give the requisite draught. In the north of England there are flues nearly a mile in length. But this method is not always applicable, owing to unfavorable situation of the works. The use of steam, although theoretically the most promising of all, has not been found to give good results. The composition of the fume differs with the ores used, and also with the distance from the furnace, where the flue system is employed. It is mainly sulphate of lead mixed with a small amount of the earthy and metallic ingredients of the ore, and varies in color from gray to white. The loss of lead in the fume, when condensing arrangements are not used, has never been accurately determined. Fallize estimates it on an average as 10 per cent. of the assay value of the ore in lead, which is doubtless too high. The amount of lead obtained from the fume in proportion to that obtained from the ore and slag, at the Keld Head smelting works in England, for one year's work, was 7.63 to 100.—The character of the furnace lead depends on the nature of the ores from which it is produced. It is very frequently contaminated with other metals, notably antimony and copper, to a degree to make it unfit for use in the arts. It must then undergo a process of purification. This process, called indifferently refining, softening, improving, or calcining, is effected by melting the lead in the hearth of a reverberatory furnace, or in a large shallow cast-iron pan in the place of the hearth, and exposing it at a dull red heat to free access of the atmospheric air, or to the action of a blast of air. The foreign metals present oxidize and rise to the surface in the form of a scum or dross, which also contains a large amount of oxide of lead. This is skimmed off from time to time, and a fresh surface of lead exposed. The operation is continued until a test sample shows that the lead has acquired the proper degree of softness. The length of time required for this process depends on the amount of impurities present and on the extent of surface exposed. Three or more days are often required where the amount of antimony is considerable; and if present in very large amount, the lead may be completely oxidized before it is softened. The dross or scum, consisting mainly of oxides of lead and antimony, is reduced by coal and a second hard lead obtained, which is much richer in antimony than the first. If this cannot be profitably softened, it is sold as hard lead, to be used in the manufacture of bullets, shot, type metal, or pigments. The lead is frequently "poled" after tapping; this operation consists in the immersion of a piece of green wood under the surface of the molten lead; the escape of moisture and the carbonizing of the wood cause a lively ebullition, exposing a considerable surface to the oxidized influence of the air, and thereby assisting in the removal of the last traces of impurities. The following are analyses of a few varieties of furnace and refined lead:

CONSTITUENTS.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.
Lead .....	96.69	99.9660	.....	99.27	86.53	52.84	99.95200	99.98720
Copper .....	0.20	trace	0.2240	0.12	traces	traces	0.08180	0.00710
Antimony .....	0.71	0.0260	0.6970	0.37	11.29	47.16	0.00590	0.00250
Arsenic .....	1.80	.....	.....	.....	.....	.....	.....	.....
Iron .....	0.06	0.0039	0.0045	0.04	0.84	traces	0.00170	0.00110
Zinc .....	.....	0.0041	.....	.....	.....	.....	0.00870	0.00080
Silver .....	0.53	.....	.....	.....	.....	.....	0.00500	0.00180
Sulphur .....	.....	.....	trace	.....	.....	.....	.....	.....

I. Freiberg furnace lead. II. Bleiberg (Carinthia) furnace lead. III. Upper Hartz furnace lead. IV. English hard lead. V. Lead from dross of calcination of IV. VI. Lead from dross of calcination of V. VII. Refined English lead, "W. Blackett, best selected." VIII. Refined Upper Hartz lead (Clausthal), desilverized by zinc.

—Silver is extracted from lead by exposing the melted argentiferous lead to the action of a blast of air at a temperature above the melting point of litharge. The lead is converted into oxide, while the less oxidizable silver remains unaffected. This process, called cupellation, is of great antiquity. In the opinion of Percy it is plainly indicated in Jer. vi. 29, 30: "The bellows are burned, the lead is consumed of the fire; the founder melteth in vain; for the wicked are not plucked away. Reprobate [refuse] silver shall men call them, because the Lord hath rejected them." "In this passage all the essential points are mentioned: the artificial blast, the oxidation or consumption of the lead, and the 'reprobate silver,' silver dross, or litharge. There is either no residue of precious metal, or what remains is contaminated with impurities, so tenaciously adherent as not to admit of being separated by the oxidizing and solvent action of molten litharge." The operation may be performed in a variety of ways. The two prominent systems are the German and the English. The German cupelling furnace consists of a large shallow hearth, somewhat elliptical in shape, about 8 or 9 ft. in diameter, made of marl or a mixture of limestone and clay, firmly stamped down, but retaining a certain degree of porosity and absorbent power for molten litharge. On one side is a fireplace for either wood or coal, and at right angles to it are the nozzles, generally two, for supplying the blast. Nearly opposite to the blast, and near the fireplace, is an opening for the removal of the litharge. The top or head of the furnace is movable, and is let down and luted on when the operation is ready to begin. From 35,000 to 37,000 lbs. of lead are treated at one operation, of which 13,000 are introduced in the form of pigs at the beginning, and the rest after the litharge has begun to flow. When the pigs first introduced are melted, there remains a sand-like scum (*Abzug*) on the surface, composed of impurities in the lead, some metallic lead and oxide, and particles from the hearth. This is removed, and the surface of the metal exposed. The first litharge which forms is pasty, and contains largely the impurities in the lead, principally antimony, and is called black litharge (*Abstrich*); it gradually becomes lighter in color, and passes into pure litharge. This is allowed to flow from the hearth as fast as formed by cutting notches in the marl of which

the hearth is composed, and is caught in iron moulds. The interior of the masses thus formed cools slowly, and has generally a red color, and is then sold as such. The rest of the yellow litharge is reduced to metal in furnaces by itself. That which forms during the latter part of the operation contains considerable silver, and the lead obtained from it is again cupelled, after concentration of the silver, by one of the processes presently to be described. When the operation is nearly completed the thin layer of molten litharge covering the silver breaks away, leaving the bright surface of the silver exposed. The silver is then said to "blick," and the mass is called blick silver. This still contains from 8 to 10 per cent. of impurities, and must be further refined. This could be effected on the hearth of the cupellation furnace, by simply continuing the operation at an increased heat; but as the loss of silver would be large under these circumstances, the silver is removed and placed on a small hearth especially prepared for it, and exposed at a high temperature to a strong blast, with occasional stirring, until it is "fine." In this operation it absorbs oxygen, which on cooling is often violently expelled, giving rise to the phenomenon of "spitting." In some cases a large amount of lead is cupelled until the silver is concentrated to the extent of 10 per cent. of the lead, when it is tapped off and further cupelled on another hearth. The cupellation of large quantities of lead at one operation is especially adapted to those cases where the lead is impure, as the foreign matters are then all removed in the abstrich, the litharge subsequently formed being pure. In Freiberg, Saxony, where the amounts mentioned above are cupelled at one operation, there are formed 400 to 600 lbs. of abzug, but no abstrich, as the lead is previously refined, from 32,000 to 33,000 lbs. of litharge, and 520 to 530 lbs. of silver; the loss of lead is from 8 to 10 per cent. Ore very rich in silver is often directly submitted to cupellation by placing it under the pigs of lead in charging the furnace. In the English system an elliptical frame of wrought iron, about 4 ft. long and 2½ ft. wide, is filled with moistened bone ash, firmly packed down, and then scooped out to the depth of about 3 in. This "test" is placed in a furnace, having a large fireplace on one side of the ellipse; at one end is the nozzle supplying the blast, and at the other is the



opening for the removal of the litharge. The test having been previously heated, melted lead is poured into the cavity in the bone ash, and oxidation at once commences. A constant supply of lead is kept up by gradually protruding pigs of lead through openings at the back of the furnace. When the lead in the test has become enriched, say from 200 or 250 oz. to 3,000 oz. per ton, it is tapped off, by drilling a hole through the bottom of the test, into an iron pot below, and cast into pigs. After tapping, the hole is plugged up with the same material of which the test is composed, and the process resumed. The enriched lead is placed on a fresh test, and the operation continued until the silver is fine. The loss of lead in the English process is said to be 5 per cent. The tests and hearth in both processes which have become soaked with litharge are broken up and added in the ore smelting.—The amount of silver in lead that will repay extraction by cupellation was formerly considered to be about 8 oz. per ton. Within the last 50 years two processes of concentrating silver in lead have been invented, by means of which silver to the amount of 2 oz. or less can be profitably extracted. The first of these processes, introduced by Pattinson about 1833, was universally employed until replaced in a great measure by Parkes's process, which was perfected about 1866. Pattinson's process depends on the fact that when molten lead containing silver is allowed to cool slowly, crystals of lead nearly free from silver separate, which can be removed by means of a perforated ladle, leaving a lead much enriched in silver. Lead to be submitted to this process should be refined, and contain only traces of antimony or other metals which impede the formation of crystals of poor lead. The following will serve to give a general idea of the manner of carrying out this process in practice. A battery of seven large iron pots, capable of holding  $6\frac{1}{2}$  tons of melted lead each, is arranged in a straight line, each pot being provided with a separate fireplace. At one end is a smaller pot holding 3 tons for the "poor" or marketable lead. Pot No. 4 we will suppose to contain 126 cwts. of molten lead, containing from 7 to 8 oz. of silver per ton of lead. As fast as crystals of lead form on cooling, they are taken out on a perforated ladle, allowed to drain thoroughly, and placed in pot No. 5; 90 cwts. of lead, containing from  $3\frac{1}{4}$  to 4 oz. of silver, are thus transferred, and the remaining 36 cwts., containing 16 to 8 oz., are ladled into No. 3. To No. 5 is added 36 cwts. of lead, with the same amount of silver as that already in it (16 to 18 oz.); and of this 90 cwts. of crystals, containing from 2 to  $2\frac{1}{2}$  oz., are ladled into No. 6, and the 36 cwts. remaining, holding 7 to 8 oz., transferred to No. 4. No. 6 is treated in the same way as No. 5; 90 cwts. of lead crystals, containing 1 to  $1\frac{1}{2}$  oz., being ladled into No. 7, and 36 cwts. of  $3\frac{1}{4}$  to 4 oz. into No. 5. From No. 7 crystals containing 9 to 10 dwts. of sil-

ver are ladled into the market pot, and then cast into pigs ready for sale. The nature of the operation in the other direction toward pot No. 1 is sufficiently indicated by the above. The operation goes on continuously, market lead being produced at one end, and at the other rich lead which is cupelled. It is found that concentration of the silver beyond 200 to 300 oz. to the ton of lead is not advantageous. From 846 cwts. of lead, of 7 to 8 oz. silver to the ton, there is obtained (in an example given by Pattinson) 36 cwts. of rich lead, containing 160 to 170 oz., and 810 cwts. of poor lead, with 7 to 8 dwts.; ratio of rich to poor, 1:22.5. There are numerous systems of conducting the process, but the above two-thirds system is perhaps the one most generally employed.—Parkes's process is founded on the fact that when zinc is thoroughly mixed with melted lead containing silver, and the mixture allowed to cool tranquilly, nearly all the zinc will rise to the surface and bring the greater part of the silver with it. Parkes first introduced his process in England in 1850, but owing to some practical difficulties it was abandoned. Experiments were made on it in Germany under the direction of Karsten in 1851, which did not result favorably. In 1866 the subject was again investigated in Germany, the difficulties previously encountered were overcome, and the process was made a practical success; it is now rapidly replacing Pattinson's process. The argentiferous lead is melted in a large pot, and zinc added in a perforated iron box and thoroughly mixed by stirring. The amount of zinc used is from 1 to  $1\frac{1}{2}$ , and sometimes as high as 2 per cent. of the weight of the lead; it is generally added in three portions. After the removal of the zinc crusts, the lead contains only traces of silver, but retains about 0.75 per cent. of zinc. This must be removed before the lead is marketable. It may be effected by heating in a reverberatory furnace, as in the usual process for softening, by prolonged piling, or by steam. The use of steam was introduced by Cordurié, and is found to be prompt and efficacious in removing the zinc. The steam is forced through the molten lead in a large kettle provided with a cover. When a sufficient quantity of zinc crusts have accumulated, they are liquated at a gentle heat, giving lead, which is returned to the desilvering pots, and a residue containing, according to the amount of lead removed by liquating, from 1 to 3 per cent. of silver. The treatment of this enriched product without loss of silver has been the greatest difficulty in the practical working of the zinc process. It is at present either heated in retorts, by which the zinc is distilled off and a rich lead left, or treated by Cordurié's process by steam, by which the zinc and part of the lead is oxidized, and a lead rich in silver left as before. In Havre, where Cordurié's process was first introduced, the steam in the treatment both of the desilverized lead and the zinc crusts is employed at a pressure

of 60 lbs. or more, while in the Hartz a pressure of 15 lbs. is found to be ample. The oxides of lead and zinc produced by the action of the steam on the zinc crusts contain considerable silver. In the Hartz they are added directly to the rich lead in cupelling; in Havre they are treated with muriatic acid to dissolve the oxide of zinc, and the residue, consisting mostly of chlorides of lead and silver, is melted in an iron pot, and a lead rich in silver obtained. The oxides produced by the dezincification of the poor lead are generally, after removal of shots of metal by washing, used for pigments. It has been found experimentally in the Hartz that when zinc is added in quantity much too small for complete desilverization, as for instance when 40 lbs. of zinc are used for 12½ tons of lead, a greater part of the copper and all of the gold is removed in the first skimmings. In this way small quantities of gold in lead may be concentrated. It is stated that formerly at Rothschild's works in Havre 250 tons of lead were treated every month by Pattinson's process, or 10 tons in 24 hours; 50 to 52 men were employed, and coal was used equal in amount to 40 to 50 per cent. of the weight of the lead. The loss on Cartagena lead was 6 per cent., on pure lead 4 per cent. In 1868, by the zinc process, with two mixing and two receiving pots containing 16 tons each, 20 tons were treated in 24 hours, or 500 tons per week; 23 men only were employed; the loss upon pure lead was 1 per cent., and the consumption of coal 10 per cent. of the weight of the lead; the cost was 25 francs per ton, against 55 francs in Pattinson's process. Later results from the Hartz show a loss of lead in the zinc process of about 1.5 per cent. of lead, not including the lead in the various large products which are either sold as such or worked over. (For a full discussion of the metallurgy of lead, see Percy's work on that subject, London, 1870, from which much of the above has been taken.)

—*Uses and Manufactures of Lead.* As metal, lead is principally employed in sheets for sulphuric acid chambers and concentrating pans, and for linings of tanks, cisterns, &c., in pipes for water and gas supply, and in shot. It further enters into the composition of many useful alloys. The compounds of the metal are mainly used as pigments and in the manufacture of flint glass. Sheet lead, formerly made by casting, is now generally made by rolling, or milling, as it is usually termed, the product bearing the name of milled lead. The Chinese prepare their well known tea lead by casting, notwithstanding its thinness. The operation is performed by two men, one of whom pours the molten lead from a crucible upon a large flat slab, when the other quickly places a large stone on the fluid lead, and presses it out to a thin flat plate, which is then removed and trimmed. English milled lead has largely replaced the tea lead of home manufacture in China. In the process of milling, slabs of lead, formed by casting in open moulds of cast iron,

are passed between cylindrical iron rolls until the lead has attained the desired dimensions. The rolls used are provided with suitable mechanism by which the distance between them can be regulated, and with reversing gear so that the slabs and sheets can be passed backward and forward. When the slab has attained unwieldy dimensions by extension, it is divided into pieces of suitable size, which are rolled separately. The same slab may be passed through the rolls 200 to 300 times, and become thereby elongated from 6 or 7 to 400 ft. If in rolling any depressions are observed on the upper surface of the slab, little pieces of sheet lead are placed in front of these depressions so as to force the subjacent lead into them and fill them up; when this is accomplished the pieces are taken off. The rolling may be conducted immediately after casting, while the slabs are still hot, or they may be allowed to become cold before rolling.—Lead pipe was formerly made by casting a short thick cylinder with the required bore, and rolling this cylinder out over a mandrel. Tubes made in this way were limited to 20 or 30 ft. in length. By the improved method a hydrostatic press is employed to force the melted lead through dies of the required sizes. The press is under the floor, through which the piston passes, entering a strong upright metallic cylinder. This can be filled with lead as required by a spout in the top, and the spout can be then closely shut. The cylinder is kept to the temperature of melting lead by an annular fireplace or receptacle for live coals by which it is surrounded. Connected with the top of the cylinder is a steel die of the diameter required for the outside of the pipe, and through its centre passes from the centre of the piston below the mandrel which determines the diameter of the bore. As the piston is driven upward, the lead in the cylinder is forced through the annular space between the fixed collar or die and the mandrel, and emerging above cools in the form of a finished pipe, and is immediately coiled upon a drum suspended above the apparatus.—Lead shot might with propriety be classed among the alloys of lead, for though sometimes made of simple lead of inferior quality, the metal is very commonly combined with arsenic, introduced in the form of white arsenic (arsenious acid) or of orpiment (the sulphuret). The effect of the arsenic is to render the hard, brittle qualities of lead, which are contaminated by antimony and iron, softer and more ductile, and of the proper consistency, when melted and subjected to the usual process in shot making, for taking the globular form. The more ductile the lead the less arsenic is required, but hard lead requires 1 per cent. or more of arsenic; usually from 0.3 to 0.8 per cent. is added. When the lead to the amount of two or three tons in a pot is melted, a circle of ashes or powdered charcoal is laid around the edge of the metal, and the arsenical compound wrapped in coarse paper is introduced in the centre by means of

a wire basket and stirred in. The pot is then covered and the lid luted down and left for some hours, during which time the arsenical compound is decomposed, the greater part of the arsenic combining with the lead, while a portion mixes with the litharge produced by the reaction of the white arsenic on the lead. The mixture is then tested by dropping a portion of it through a colander into water. If the particles assume a lenticular form, the arsenic is in excess; if they are flattened on one side, hollowed in the middle, or elongated, too little arsenic was used. When properly dosed it is run into bars, which are raised to the top of the shot tower, to be there melted and poured through the colanders. These are either hollow hemispherical iron disks or rectangular flat sheets, each one perforated with a set of holes of uniform size, made perfectly smooth and exact. The lead when poured must be of the proper temperature for the special size to be made, and the workmen are careful to keep a film of the oxide as a lining to the colander, which is thought to have the effect of increasing the rotundity of the shot, possibly by expediting its cooling as it passes through. The holes vary from  $\frac{1}{16}$  to  $\frac{1}{8}$  of an inch, but the shot are of larger diameter than the holes. In falling to the base of the tower the particles of semi-fluid lead, acted upon alike over their whole surface by the current of air, are made to assume the globular form, and by the time they reach the bottom they are sufficiently hardened by cooling to bear the shock of striking the surface of the vessel of water placed to receive them. Large-sized shot require a greater height than small-sized, and while 100 ft. is sufficient for the latter, the former will require 150 ft. Dr. Ure notices a shot tower at Villach in Carinthia, 249 ft. high, as the highest erection of this kind. Taken from the cistern of water, the shot are dried, then assorted according to their sizes by sifting them in a revolving copper cylinder set slightly inclined and perforated with holes, which increase in size toward the lower end. The smaller sizes thus drop through above and the larger lower down, and each size is received in its own box. The shot receive their superficial finish by being left for some time in a rotating cylinder with some pulverized graphite. Imperfect shot are separated from the truly spherical by allowing them to roll down an inclined plane, so arranged that the latter run straight down the middle and the former work off to one or the other side. Shot are also made by pouring lead upon a revolving table on which is placed a cylinder of perforated sheet brass. The table is revolved with a velocity of 1,600 ft. per minute on the periphery, and the lead is thrown by centrifugal action through the perforations in the sides, forming round brilliant shot, which strike against a linen screen placed so as to intercept them. A method has been patented in the United States of manufacturing shot without the high towers, sub-

stituting for them a low elevation up which a powerful current of air is blown, thus producing the effect of a long continued fall.—The most important alloys of lead used in the arts are those with antimony and tin. The alloys with antimony are more fusible than lead alone, but are much harder and more readily oxidized. Type metal is of variable composition, but in general may be said to consist of 4 or 5 parts of lead to 1 of antimony; sometimes tin is added. The alloy of tin and lead is used for soldering. Three varieties, known as fine, common, and coarse solder, are composed respectively of 2 parts tin to 1 of lead, equal parts of tin and lead, and 1 of tin to 2 of lead. Pewter is also composed of lead and tin; but other metals, as copper, antimony, and zinc, are often added. Common pewters contain 80 parts of lead to 20 of tin, others equal parts of the two metals, while the finer kinds contain but 16 to 20 per cent. of lead. The French government sanctions the use of vessels of 18 per cent. lead and 82 tin as quite harmless for containing wine or vinegar. Although so soft in itself, lead has the property of hardening tin. These alloys are distinguished by the facility with which they ignite and burn. The alloy of 4 or 5 parts of lead and 1 of tin burns like charcoal at a red heat, the combustion continuing like that of an inferior peat with the formation of cauliflower excrescences. This action appears to be due to the affinity which exists between the two oxides, which when fused, either alone or with silica or an alkali, produce a white opaque enamel, used for dial plates and also in earthenware. Bismuth unites readily with lead in all proportions, forming alloys which have no application in the arts, but are used to adulterate mercury. An alloy of 1 part of lead, 1 part of bismuth, and 3 parts of mercury is sufficiently fluid to pass through chamois leather. With bismuth and antimony lead forms an alloy which expands on cooling, and is used in casting stereotype plates. They are composed, according to Mackenzie, of 70 per cent. of lead, 15 of antimony, and 15 of bismuth. The triple alloys of lead and bismuth with tin or zinc are remarkable for their low melting point, which lies in many instances below the temperature of boiling water. Many metals, as zinc and copper, have but little tendency to form alloys with lead. When mixtures of lead and zinc are kept in a molten condition for some time at a comparatively low temperature, the zinc rises and forms a scum on the surface, leaving the lead nearly free from zinc. When a mixture of lead and copper, which has been quickly solidified, is heated to a point but little above the melting point of lead, a large proportion of the lead containing a little copper liquates out, leaving a residue of copper containing lead. This behavior of these metals is of practical value in the desilverization of lead and copper. In the first mentioned case, the zinc in separating from the lead carries the

greater part of the silver with it; and in the second, the lead which liquates from the copper likewise contains nearly all the silver. For an extended account of the alloys of lead the reader is referred to an article by Dr. Richardson in Watts's "Dictionary of Chemistry."

**LEAF.** The parts of a plant concerned in its nutrition are the root, stem, and leaf, which are termed the organs of vegetation. The leaf, as is the case with the others, is subject to many modifications, and is indeed sometimes made to serve other purposes than those of foliage; but its chief function is that of elaborating the crude material supplied by the roots and absorbed from the air into substances which will nourish and continue the growth of the plant. This work requires the light of the sun, and one of the processes incidental to it is evaporation; hence the leaf is generally constructed and arranged upon the

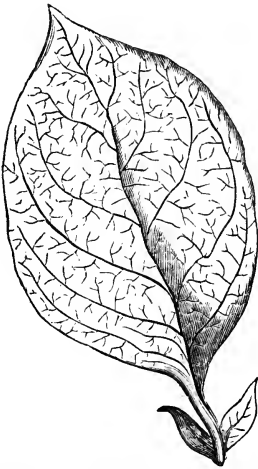


FIG. 1.—Pinnately veined Leaf, with Petiole and Stipules.

stem in such a manner as to expose the largest surface to the influence of light, and usually presents a broad evaporating and absorbing surface to the atmosphere. In its most complete form the leaf consists of an expanded portion, the blade or limb, which is attached to the stem by means of a leaf stalk or petiole, and at the base of this there are two foliaceous appendages or stipules. The stipules are characteristic of some families of plants and are always present in them, but in other families they are entirely wanting, and hence cannot be regarded as essential to the leaf; so with the petiole, which is frequently absent, the blade being attached directly to the stem, or sessile. The blade is regarded as the only essential part of the leaf, and though this presents itself in a vast variety of forms, the same general structure is manifest in all. In all ordinary leaves two distinct structures are visible: a framework or skeleton of fibres, and a green pulpy portion which fills

the spaces in this. When a principal bundle of fibres runs from the base to the apex of the leaf, it is termed the midrib; the branches from this are called veins, and the smaller subdivisions veinlets. In many leaves the smaller veinlets anastomose and thus form a complete net-



FIG. 2.—Palmately veined Leaf (Maple).

work; in others the veins run parallel and do not anastomose; as a general rule netted-veined leaves are found in dicotyledonous, and parallel-veined leaves in monocotyledonous plants. The form of the leaf largely depends upon the disposition of the veins; if there is a midrib with smaller branches or veins from each side, the leaf is said to be pinnately veined, and is usually longer than broad; but if there are several principal ribs starting from the base of the leaf, it is palmately veined, and its outline will be more or less orbicular. The skeleton or framework of the leaf consists of proper wood, and the microscope shows the various vessels, ducts, and fibres found in the stem itself; and this portion of the leaf is regarded as an expansion of the woody system of the stem, or rather of the inner bark. Its structure is beautifully shown in what are called



FIG. 3.—Parallel-veined Leaf.

skeletonized leaves, often seen as parlor ornaments; these are prepared by macerating the leaves in water until the softer parts have decayed, and arresting the process while the fibres still remain intact. The pulpy portion of the leaf, cellular tissue or parenchyma, consists of

several layers of cells containing chlorophyll or leaf-green; those nearest the upper surface are elongated and packed close together with but few spaces between them, while the cells of the lower part are irregular in shape and placed loosely together to leave abundant air spaces among them. The darker green color of the upper surfaces of most leaves is due to the more compact character of the cellular tissue in that part of the leaf. This portion of the leaf is regarded as an expansion of the green layer of the bark. Both surfaces of the leaf are covered by an epidermis consisting of empty, thick-walled cells, which cohere so firmly that it may often be stripped off from the other portions of the leaf; the cells of the epidermis are frequently very irregular in outline, and are mostly in a single layer, but in plants which have to resist long droughts there are several layers. The epidermis being impermeable, there could be no communication between the interior of the leaf and the atmosphere were it not for the multitude of breathing pores or stomata provided for this purpose. Each of these stomata is guarded by

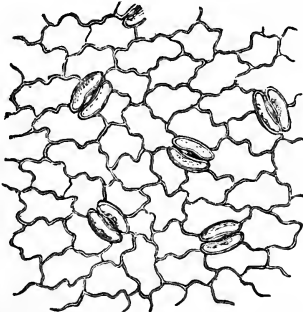


FIG. 4.—Stomata of Epidermis (magnified).

a pair of curved cells, which, unlike those of the epidermis, contain chlorophyll; these cells are sensitive to the action of moisture, and by their change in form enlarge or diminish the opening. Through these pores the air has direct access to the spaces among the cells of the leaf, and as these are mostly near the lower surface, so the stomata are most numerous in that portion of the leaf. The stomata in some plants are 20 times more numerous in the epidermis of the lower than in that of the upper surface. The number is estimated to vary in different plants from 800 to 170,000 to the square inch of surface. The epidermis has its cells often prolonged into hairs of various shapes. By careful manipulation a transverse section of a leaf may be made, and this examined with a microscope of moderate power will show, first, a layer of empty cells of the epidermis; next, elongated cells, containing chlorophyll, with their longer diameters placed transversely and closely compacted; then similar cells with their long diameters parallel to the face of the leaf, with numerous air spaces

among them; and finally, the epidermis of the lower surface.—The forms assumed by simple leaves are almost innumerable, and as they are much used in systematic botany in the determination of species, they have a technical nomenclature which it would be out of place to

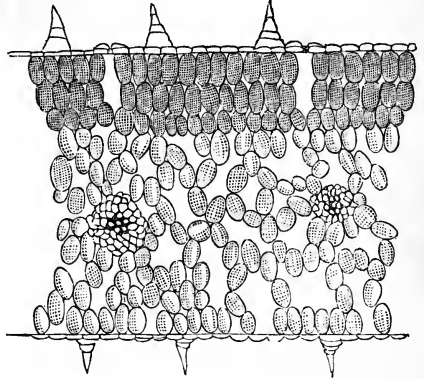


FIG. 5.—Cross Section of Leaf (magnified).

give here. The two principal divisions of pinnately and palmately veined have been mentioned. Each kind of venation in its modifications gives rise to two sets of forms as to general outline, and we have every gradation from the narrowly linear leaves of the grasses to the orbicular and kidney-shaped leaves. By modifications of the base of the leaf a set of forms, as arrow-shaped and heart-shaped, are produced, and by changes in the apex another set, from the long acuminate to the abruptly truncate. Changes in the margin are innumer-



FIG. 6.—Acacia, with Pinnate Leaves and Phyllodia.

able; in many leaves the edges are entire, but more frequently they are finely or coarsely serrate, toothed, or lobed, and the blade of the leaf is sometimes lobed or divided quite down to the midrib; the pinnately and palmately veined leaves when lobed giving two distinct sets of forms. So both these kinds of leaves



are often compound, *i. e.*, made up of smaller leaves or leaflets, which are articulated with a common petiole. Among trees, the locust is an example of the pinnate and the horse chestnut of the palmate compound leaves. Sometimes a stem appears to pass directly through the blade of a leaf; to such the name of perfoliate has been given; in some cases this appearance is produced by the lobes of a sessile heart-shaped leaf uniting to enclose the stem, and in others by the union of the bases of two opposite leaves.—The petiole is essentially of the same structure as the leaf, but its cellular tissue is usually small in proportion to its woody portion; its size and length, in proportion to the leaf, vary greatly; in aquatic plants with floating leaves it is several feet long, and in some palms the petiole is so large as to serve for making oars; in our garden rhubarb it takes on an unusual development, and is the useful part of the plant. In some plants the petiole is so short as to be barely perceptible, and in many entirely absent. In the aspen

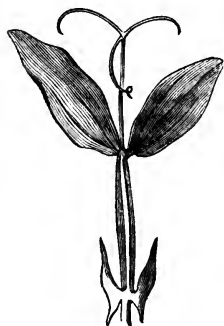


FIG. 7.—Vetch with Leaf developed as Tendril.

the petiole is flattened at right angles to the axis of the leaf, which allows the leaf to move with the slightest motion of the air, and to keep up the continuous fluttering for which the foliage of this tree is proverbial. The petiole may be channelled, or furnished with a wing on each side, as in the orange, or it may be broadly expanded at the base and sheathe the stem, as in the *umbelliferae*, thus when present affording useful characters in describing plants. In some plants the blade of the leaf is wanting, but the petiole expands and becomes leaf-like, and takes upon itself the functions of the leaf; it is then called a phyllodium. The Australian acacias afford numerous examples of phyllodia; several of these, when raised from seed, produce upon the young plants the compound leaves common to the genus; some species, when but a few inches high, show a tendency to suppress the blade of the leaf; the successive leaves have wider and wider petioles and less and less blade, until the leaf-like petioles or phyllodia constitute the sole foliage; these have parallel veins and their edges instead of their surfaces are presented to the sky and earth.—Stipules, the accessory leaf-like bodies found in many leaves at the base of the petiole, present great variety in size, form, and duration; they frequently fall away as the leaves expand; in our tulip tree (*Viriodendron*), and in the related magnolias, they are only to be found as the leaves are unfolding, and are then very conspicuous; again, they remain as long as the

leaf to which they belong, and often form a large part of it, as in the garden pea, and in a related species the blade of the leaf is wanting, and the whole foliage of the plant consists of stipules. In some cases the stipules are distinct, but in many, as in the rose, they are attached to the petiole by one edge; in the docks, rhubarb, and other members of the *polygonum* family, they are united by both margins, and thus form a sheath which surrounds the stem. The appearance of stipules in the form of spines is not rare, and is noticeable in the common locust, the caper, and other plants. Those parasitic plants which, like the dodder, rob other plants of elaborated food, have no leaves, their function being performed by the foliage of the host to which they are attached. The prickly pear and others of the cactus family are usually regarded as leafless; but these have minute leaves upon the young stems, which soon drop, and in the older ones the whole surface of the stem performs the functions of the leaf.—Leaves vary greatly in size, but generally what is lacking in size is made up in number; and thus trees with minute leaves, like the arbor vitæ, where they are like small green scales clothing the branches, present in the aggregate as large a surface of foliage as trees with much larger leaves. A little plant of our fresh-water ponds has leaves only  $\frac{1}{8}$  of an inch long, while those of the *Victoria regia*, of the South American lakes,



FIG. 8.—Barberry with Spiny Leaves.

have a diameter of 6 ft., and afford a standing place for aquatic birds while they are watching for their prey. Some palms have leaves of enormous size, and an arad discovered a few years ago in Central America (*Godwinia gigas*) has leaves over 13 ft. long.—Leaves differ greatly as to their duration; some are fugacious, falling soon after they appear; those which fall at the close of the season are deciduous, and when they remain through the year they are persistent, as in the evergreens. In some of the evergreen coniferous trees the leaves of the former year fall as soon as those of the present year are developed, while in some firs they remain 10 or 12 years before they fall. In deciduous trees the fall of the leaf is as well provided for as its development, and is not due, as is supposed by some, to the advent of frost. A distinct line of separation is early visible, and before the leaf separates

the wound which would otherwise be left is covered with a prolongation of the epidermis of the stem. The leaf scars in the horse chestnut and ailantus are large, and show the points from which issued the bundles of woody fibre to form the framework of the leaf. In palms and some other monocotyledonous plants the leaves do not fall, but wither and decay upon the tree.—The study of the morphology of the leaf presents an endless variety to a close observer, and nothing in relation to the subject is more interesting than the many abnormal forms in which leaves, besides performing their proper offices as foliage, are made to serve the plants in other respects, or are quite turned aside from their normal uses to those which ordinarily belong to the root or stem. The scales which make up the greater part of a lily bulb are only the bases of former leaves which have become thick and fleshy by the accumulation of nutriment which is to be used in the future growth of the plant. This conversion of leaves into storehouses of food is strikingly shown in some seeds, in many of which the first leaves of the embryo plant, the cotyledons, or seed leaves as they are popularly called, are quite distorted by the accumulation of starchy and other matters intended to nourish the young plant; the common bean is a familiar illustration of this; in the bean the seed leaves fall away after they have parted with their store, but in the squash and others of its family the seed leaves, after they have served their purpose of helping the growth of the young plant, increase in size, turn green, and become proper leaves. The seed leaves of the oak, pea, and others are so distorted by the food they contain that they never come to the light and appear as proper leaves. The scales which surround the buds of deciduous trees are only modified leaves, some trees showing a regular gradation from the brown dry scale to the fully developed green leaf. In the barberry the leaves often appear as spines, and in *Fouquieria*, one of the chaparral plants of western Texas, the stem of which is formidably covered with sharp points, the spine is the midrib of the leaf from which the blade has fallen away. The common pea affords an illustration of the conversion of a portion of the leaf into a tendril to aid the plant in climbing, and in a plant of the same family (*Lathyrus aphaca*) the whole leaf is developed as a tendril. Among the abnormal forms of leaves, none are more interesting than the *ascidia* or pitchers, in which, as in our native pitcher plants (*Sarracenia*), the whole leaf forms a pitcher, or, as in *nepenthes*, the pitcher is an appendage to the leaf. (See PITCHER PLANTS.) Still more wonderful is the adaptation of the leaf to serve as a trap to catch insects, as in our carnivorous Venus's fly-trap. (See DIONÆA.)—In this brief description of the leaf it has been considered in only its normal condition of foliage and some of its readily understood transformations, but the botanist regards

the flower and its resulting fruit of whatever kind as only peculiar modifications of the leaf. The idea of tracing all the floral organs to one type, the leaf, had been hinted at before Linnæus, and the great botanist himself did not present the matter in such a way as to attract much attention; the poet Goethe proposed the theory in much the same form as it is now held, but it was not until the elder De Candolle presented it that the theory of metamorphosis was generally accepted.—The arrangement of the leaves upon the stem is such as to give the greatest possible amount of divergence, and though they may appear to be scattered without order, they are arranged in a manner definite for such species, and this has given rise to a distinct department of botany involving mathematical principles, called phyllotaxy.—It has already been hinted that the chief function of the leaf is to bring the interior of the plant into communication with the sun and air; it receives the liquid taken up by the roots, and in its tissues evaporation goes on; it not only permits but regulates evaporation by the wonderful mechanism of the leaf pores. But evaporation is by no means the sole office of the leaf; the air with its gases has free access to its interior, and here takes place the process of assimilation, about which so little is known, in which carbon, oxygen, hydrogen, and nitrogen are converted into organic compounds. We know that the chlorophyl is an active agent in effecting these changes, and that sunlight is essential to the proper performance of the leaf's functions. As water is so largely evaporated in the leaf, and as this, coming from the soil, must contain more or less inorganic matter in solution, it is not surprising to find that the leaf contains a large amount of earthy matter or ash, and that leaves in autumn have a larger percentage of ash than vernal leaves; the leaves show upon analysis 10 to 30 times as much ash as the wood of the same tree.

**LEAGUE** (Sp. *legua*; Fr. *lieue*), a measure of length used for estimating distances at sea, and by European nations upon land also. The nautical league is  $\frac{1}{3}$  of a degree, or 3 equatorial miles, or 3·457875 statute miles. The land league in England is 3 statute miles. In France it has been used for different distances, as the legal post league, 2·42 English miles, and the league of 25 to the degree, or 2·77 English miles. The Spanish league is still more variable, sometimes 17 and again  $17\frac{1}{2}$  being reckoned to the geographical degree. Upon the modern roads 8,000 Spanish *varas*, or 7,418 English yards, are estimated one league. The term is supposed by some to have come from the Celtic *leach*, a stone; and by others the Gallic *leuca*, league, is traced to the Greek *λευκός*, white, white stones being used by the Gauls to mark distances upon the roads.

**LEAKE**, a central county of Mississippi, traversed by Pearl river; area, 576 sq. m.; pop. in 1870, 8,496, of whom 3,005 were colored. It has a rolling surface and a light sandy soil.

The chief productions in 1870 were 157,648 bushels of Indian corn, 21,259 of sweet potatoes, 39,855 lbs. of butter, and 4,181 bales of cotton. There were 1,017 horses, 702 mules and asses, 2,317 milch cows, 1,062 working oxen, 3,483 other cattle, 3,473 sheep, and 11,535 swine. Capital, Carthage.

**LEAKE, Sir John**, an English admiral, born at Rotherhithe, Surrey, in 1656, died in Greenwich, Aug. 1, 1720. He distinguished himself in the fight with Van Tromp in 1673, when he served on board the Royal Prince, commanded by his father, by conveying relief to the starving garrison of Londonderry, and thus compelling the enemy to raise the siege. In 1702, during the war of the Spanish succession, he was made commodore, and appointed to the command of a squadron, with which he rescued Newfoundland from the French. For these services he was made rear admiral, and soon after vice admiral of the blue and knighted. In 1705 he constrained the French and Spanish to abandon the siege of Gibraltar; in 1706 relieved Barcelona, and captured Cartagena; and subsequently reduced the Balearic isles and Sardinia. After the relief of Gibraltar and the reduction of Cartagena, he was made vice admiral of the white, and presented with £1,000 by the queen; in 1707 he was appointed commander-in-chief of the fleet, and in 1709 rear admiral of Great Britain and a lord of the admiralty; and on retiring from active service, in the reign of George I., a pension of £600 was settled on him by parliament. He represented Rochester in parliament several years.

**LEAKE, William Martin**, an English author, born in 1777, died in Brighton, Jan. 6, 1860. Having entered the army, he was employed on special missions to Asia Minor and other parts of the East, and devoted himself to the exploration of Greece. He rose to the rank of lieutenant colonel, but retired from the service in 1823. He was a zealous champion of the national independence of the Greeks, and endeavored to procure help for them from the English government during the conflict with Turkey. In 1814 he published "Researches in Greece;" in 1821, "Topography of Athens" (2d ed., 1842); in 1824, "Journal of a Tour in Asia Minor;" in 1827, in concert with the Hon. Charles Yorke, "Notices of the Chief Egyptian Monuments in the British Museum;" in 1830, "Travels in the Morea;" in 1835 and 1841, "Travels in Northern Greece;" in 1846, "Peloponnesiaca, a Supplement to the Travels in the Morea;" and in 1854, "Numismatica Hellenica," the appendix to which was published in 1859, shortly before his death. He was assisted in many of his labors by his wife, a daughter of Sir Charles Wilkins. He also wrote several political works on Greece, including a "Historical Outline of the Greek Revolution" (1826).

**LEAMINGTON**, or **Leamington-Priors**, a town and watering place of Warwickshire, England,

on the river Leam, 20 m. S. E. of Birmingham; pop. in 1871, 22,730. It is one of the handsomest towns in England, and has a college, a Latin school, an institution for the blind, a museum, a music hall, and a theatre. Its only manufacture is that of gloves. Its prosperity and importance have mostly arisen from its mineral springs, which were discovered in 1797, and are of three kinds, sulphurous, saline, and chalybeate. The surrounding country is picturesque and beautiful, and the castles of Warwick and Kenilworth, as well as Stratford-upon-Avon, are not far distant.

**LEANDER**. See HERO.

**LEAP YEAR**. See CALENDAR.

**LEAR, Tobias**, an American diplomatist, born in Portsmouth, N. H., Sept. 19, 1762, died in Washington, D. C., Oct. 11, 1816. He graduated at Harvard college in 1783, and in 1785 became private secretary to Gen. Washington, by whom he was always treated with great courtesy and regard. For several years he attended to the details of Washington's domestic affairs, and was most liberally remembered by him in his will. In 1802 he was consul general at Santo Domingo, and afterward consul general at Algiers and commissioner to conclude a peace with Tripoli. He discharged this latter duty in 1805 in a manner which gave umbrage to Gen. Eaton, who in concert with Hamet Caramelli, the deposed bey, had gained important advantages over the reigning bey. It was thought that to accept terms of peace at this juncture was to throw away the fruits of hardly earned success; but Mr. Lear's conduct was approved by his government, though much blamed by a portion of the public. He returned shortly after to the United States, and at the time of his death was employed in Washington as accountant of the war department.

**LEARCHUS**, a Greek sculptor of Rhegium, in southern Italy, who flourished probably between 700 and 650 B. C. He belongs to the semi-mythical Dædalian period, and the accounts of him are vague and confused. Pausanias mentions a statue of Jupiter attributed to him in the brazen house at Sparta, which was considered the most ancient work of the kind. It was made of hammered pieces of brass riveted together.

**LEASE**, in law, the contract whereby one party (the lessor or landlord) transfers to another party (the lessee or tenant) the use and possession of real estate. The word is sometimes used also to designate a contract for the letting and hiring of personal property. No certain words or forms are necessary for this purpose; but a lease must describe the premises to be demised with an accuracy that is sufficient for certain identification; though any inaccuracies or uncertainties as to names, dimensions, locations, amounts, or terms may be explained if the other parts of the instrument suffice to make them certain. As a general rule, they may be explained by evidence

outside of the contract, provided this evidence neither varies nor contradicts the written contract. If the uncertainties cannot thus be cured, they may be rejected, if they leave behind them a good and sufficient instrument. Generally, anything, whether real or personal, which is hired to be used, carries with it all the appurtenances and accompaniments already connected with it, and proper or necessary for that use of it. We will in this article consider: 1, the right and obligation of the lessor; 2, those of the lessee; and 3, some special rules of law applicable to leases.—If the lease be under seal, there is an implied covenant of good title in the lessor, and in all leases there is one of quiet enjoyment by the lessee. If the lease contain an express covenant of renewal, on reasonable terms, which do not imply perpetuity, the law enforces them. But a lease for six years, with a covenant to renew “on the same terms,” means the same terms excepting the covenant to renew, which will be omitted; for otherwise this covenant to renew would amount to a perpetuity, which the law prohibits. The landlord is under no obligation to repair the premises, without an express covenant to that effect; and it seems to be the decidedly prevailing rule, that the uninhabitableness of the premises is no defence against a claim of rent. The tenant is bound to pay his rent as agreed on, but not to pay the taxes unless the lease so specifies; but this may be inferred from an agreement that the lessee shall pay his rent “free from taxes and charges,” or “a net rent,” or any similar phraseology. In general, if the lease does not contain a clause giving the lessor a right to reënter and oust the lessee on his failure to pay rent, the lessor has no such right. And if there be such a clause (as is commonly the case in American leases), the law is exceedingly exact and punctilious as to the exercise of this right of reëntry. That is, to justify it, a demand must be made for the rent due, and of the precise sum, on the precise day when it is due, at a convenient hour before sunset, and at the very place where it is payable if one be specified, or otherwise at some accessible, conspicuous, and noticeable place on the premises. Without express agreement, a tenant is not bound to make repairs. It has been sometimes held, however, that he was bound to make such repairs as his own use of the house causes to become necessary, or such as are called for by some accident and are required to prevent the premises from becoming untenable. Generally, an outgoing tenant should leave the premises wind and water tight, but is not bound to any ornamental repair, unless his covenants require this of him. If the tenant agrees to make repairs, and to leave the premises in good repair, he is not justified in not doing so by the fact that the premises were not in good repair when he took them. If, with no obligation on his part to repair, he chooses to repair, the lessor is not bound to

repay him unless he promises so to do. It is important to know, that if a lease contains a covenant on the part of the lessee to keep the premises in repair, and to return them in good repair, he must not only repair if injured by a fire, but rebuild if the house is burned down, unless it be done by the act of God or of the public enemy. And if there be no such clause, although the lessee is not bound to rebuild, he is bound (by a prevailing but not universal rule) to continue to pay rent during the lease. Hence the best and most carefully prepared leases in recent times provide expressly (and all leases should), that if the premises shall be made untenable by fire, in whole or in part, the rent shall cease or abate proportionably until repair or rebuilding; and the clause requiring repair and a return of the premises in good condition contains the exception, “unless in case of injury by fire or other unavoidable accident.” In the absence of express covenants, the tenant is not bound to rebuild a house burned down through his own negligence or that of his servants. The tenant of a farm is bound, without express covenants, to manage and cultivate the same in such wise as good husbandry and the usage of the neighborhood require; and for any wide departure from this he would be responsible in damages. A tenant may assign and transfer, if he do not covenant otherwise, the whole or any part of his lease. Technically, if he transfers the whole, it is an assignment; if less than the whole, it is under-leasing. If therefore he covenants, as is commonly done, “not to assign, transfer, or set over” the lease, this does not restrain him from under-leasing any part of it; and to prevent this, the words “or any part of it” should be added.—A tenant cannot defend against his landlord’s claim for rent, by denying or contesting his title to the premises, unless the tenant can show that the landlord caused the tenant to accept the lease by a fraud upon him. But it was always held that a landlord forfeited his rent, and authorized the tenant to cancel the lease, by his expulsion of the tenant from the premises; and now it seems to be law, at least in the United States, that the lease is cancelled and all right to rent lost by any violent outrage or indecency on the part of the landlord, or any intentional and material interference with the tenant’s proper use and enjoyment of the premises. (For the right of an outgoing tenant of a farm or garden to his crops, see EMBLEMENTS; for his right to remove anything he has added to the premises, see FIXTURE.)—The lease may be for the life of either the lessor or the lessee or any other person, and then the lessee has a freehold, which is considered in the law as real estate. Or it may be for any term of years, and then it is a chattel only, although a real chattel; for the law regards a lease determinable at a time certain, however distant that time, as a less estate than one for the life of any person, however old or feeble he may be.

Where a tenant, with consent of the landlord, enters into possession without any express bargain, he is a tenant at will. To avoid some technical incidents of this tenancy, there grew up in England a custom, which the law soon sanctioned, of considering such an estate as a tenancy "from year to year." The one essential principle is, that a tenancy at will may be determined by the will of either party, but only after reasonable notice given by the party intending to terminate the tenancy. There is no uniformity either of rule or usage as to what this notice should be. In some instances, a notice of six months may still be necessary, as it is in England. One of three months is more frequently sufficient; and in some states the notice must be equal to the interval between the periods of payment of rent. The rule is given in most of our states by statute, but depends in some upon adjudication or usage. Generally, the notice should cover the whole of the interval between payments. Thus, if the rent is paid quarterly, and three months' notice is sufficient, and the notice is given in the middle of a quarter, it takes effect at the end of the next quarter. No particular form of notice is necessary; but there must be reasonable certainty in the description of the parties, of the premises, of the purpose, and of the time. If a tenant for years holds over after the determination of his lease, he is technically a tenant on sufferance; and a tenant on sufferance is not a tenant at will. But by the prevailing rule of this country, such a person, if the lessor do not object to his holding over, is a tenant at will, holding upon all the terms and conditions of the expired lease which have not necessarily expired with it; that is, for example, he pays the same rent, at the same time.—If the lessor sells and transfers all his estate, the tenant now owes rent to the purchaser. If he sells a part only, there must be an apportionment of rent. So if the lessor die in the midst of the term, the rent is apportioned accordingly. If the lessor and his assignee agree as to the apportionment, the lessee is bound by it, because it is of no interest to him whether he pays to one or another.—As to the remedy of the lessor for rent due, in some states the law of distress for rent remains. (See DISTRESS.) Where it does not, the lessor has only the same remedy he would have for any other debt of the same amount.—There are in most of our states provisions resembling those of the statute of frauds, which determine what leases may be oral, and what must be in writing. So also it is generally provided that leases of a certain length (most frequently seven years) should be recorded in the registry of deeds.

**LEATHER** (Sax. *lether*, from *lithe*, *lither*, soft, flexible), an insoluble compound of the gelatine and fibrine of hides and skins with tannic acid, though under the general name of leather are included many kinds in which the hide or skin is preserved and made suitable for various

uses without such chemical union of the gelatine and tannin, and also where other materials than tannic acid are used in combination with the gelatine and fibrine of the skin. From the most remote periods leather has been prepared for clothing and various useful and ornamental articles. The Hebrews ornamented it by giving it bright colors, as appears by the mention in Exodus of rams' skins dyed red; and they employed it, after the manner of the Egyptians, for vessels to contain water, and for a multitude of other uses. The paintings and sculptures of Thebes represent many of the methods of working leather practised by this people as very similar to those of the present time. Figures of men are seen currying, stretching, and working it, employing a semi-circular knife like that of modern curriers, the awl, a stone for polishing the leather, and other implements such as shoemakers now use. In their shops a prepared skin was suspended as the emblem of their trade, together with ready-made shoes and other articles in leather. For covering harps, shields, &c., their leather was ornamented by embossing and coloring. For strong cords it was cut into thongs and twisted like ropes; and it was also used in the form of straps. For tanning they used the pods of the *sont* or acacia, the acanthus of Strabo and other writers, and probably also the bark and wood of the *rhus oxyacanthoides*, and the bark of the *acacia seal*, both natives of the desert. Of the methods of preparing the leather used by the Romans no accounts are preserved; and the processes of the middle ages also are lost. The Saracens, it is recorded, used alum, the efficacy of which for preserving skins is well understood. The Calmucks at the present time make use of a solution of alum and of static root, and also of sour milk, in preparing the skins of sheep and other animals. From the largest species of sea carp they have from remote times prepared garments which are nearly water-proof, making use of sour milk, or some astringent, with which the skins, first dried and cleaned, are dressed three times a day, after which they are finished by exposure for several days to a dense smoke. The Britons exported skins in early times, but afterward learned the art of tanning, and carried it on in establishments of great extent erected on the banks of the streams. Many rude nations now prepare leather by methods of their own. In both North and South America the dried skins, cleaned from the hair, are placed in earthen vessels with the powdered brains and some water, and heated to about 95° F. The cerebrous matter forms a lather, which thoroughly cleans the skins and makes them pliable. After remaining immersed for some time, they are taken out and stretched tightly in a frame, in which state they are rubbed with a smooth stone to expel the water and fat. Sometimes after this they are also smoked, by which they are made to resist better the action of water. In the Pacific countries of North



America leather is skilfully tanned by the natives, who employ some of the vegetable productions of the country for the purpose. The dressing and working of leather in Japan and India are considered the most degrading of all pursuits; the class that practises them is tabooed, and others are contaminated by communication with any of its members.—*Hides and Skins.* The heaviest ox and cow hides form the principal material from which sole leather is made; those from cattle which are not fully grown, and also those from the smaller cattle of India and Africa, are generally made into what are called upper leathers, in contradistinction from calf skins; upper leather, as known to the trade, including kip, wax kip, grain, buff, and split leather. Horse hides are used to only a limited extent in the United States, but are largely manufactured in Europe, the leather being known there as cordovan (from Cordova in Spain, formerly famous for its manufacture), and some portions of the hide making a fine, soft leather. The American bison hide somewhat resembles that of the Calcutta buffalo, but does not make as solid sole leather. The supply of these hides has been about half a million a year since 1871, but they will probably cease to furnish material for leather in a very few years. Hog skins make the best saddle-seating, but more imitation hog skin is sold for this purpose than genuine. Sheep skins, of which the supply is very large, furnish probably more kinds of leather than are derived from any other source. The leather has but little strength and no solidity, but it is quickly tanned, generally with alum or sumach, and worked up whole or split, and serves for the cheaper kinds of pocketbooks, bookbinders' leather, shoe linings, hat linings, and a thousand cheap articles; it is also made up into imitations of many other kinds of leather; and since the introduction of aniline colors, which have been very successfully applied in its manufacture, its uses seem to be almost endless. Goat skins make a stronger, closer-textured leather than sheep skins; this leather, called morocco, furnishes the principal material for ladies' fine shoes. Deer skins are largely used to make what are known as buckskin gloves and mittens, and this leather is often sold for chamois or white leather. The principal sources from which hides for tanning are obtained, besides those which are always available in every locality from the slaughter of cattle in the neighborhood, are the prairies of the west

and southwest, principally Texas, New Mexico, and Kansas; Mexico, Central America, the pampas of the country tributary to the Plata river in South America, and various portions of India and Africa. The hides taken off in the United States are nearly all tanned here. The product of Mexico, Central America, and the river Plata is principally sold at New York and Boston, London and Liverpool, Hamburg, Antwerp, Havre, and to a less extent at a few ports on the Mediterranean. The product of India and Africa is principally distributed through the same markets. East India kips form a prominent feature of the English leather market. It is estimated that the total supply of domestic hides of all kinds used in the leather manufacture of the United States amounts to about 7,000,000 annually. Of the imported hides and skins used in the American leather manufacture, fully four fifths are entered at the ports of New York and Boston. The imports at New York from 1869 to 1873 were as follows:

FROM	1869.	1870.	1871.	1872.	1873.
Buenos Ayres.	1,009,876	770,748	767,716	581,455	325,886
Montevideo. . .	363,135	406,963	640,500	442,079	379,179
Rio Grande. . .	815,250	467,565	447,226	368,564	243,214
Other foreign ports. . . . .	550,685	588,299	610,781	451,910	366,925
Total. . . . .	2,243,446	2,288,570	2,466,223	1,839,008	1,316,704

The total imports of the whole country for the above mentioned period may be roundly estimated at from 500,000 to 700,000 more than these figures for each period named. It must be remembered, however, that this table does not include any portion of the imports of lighter stock commonly classed as skins. The imports of goat skins at the principal markets for the years 1871-'3 were as follows:

PORTS.	1871.	1872.	1873.
New York . . . . .	3,200,000	3,600,000	3,800,000
Boston . . . . .	2,100,000	1,350,000	1,200,000
Philadelphia . . . . .	500,000	250,000	240,000
Baltimore. . . . .	50,000	75,000	175,000
Total . . . . .	5,850,000	5,275,000	4,915,000

Liverpool is the principal hide market of England, and here most of the imports of hides from South America arrive. English tanners generally take the choicest selections of heavy hides for sole leather. The following table shows the receipts at that port for seven years:

YEARS.	Buenos Ayres and Montevideo.		Rio Grande.		Brazil.	West Coast and Central America.		North America.	West Indies.	East Indies.	Horse hides.	N'found-land seal skins.
	Dry.	Salted.	Dry.	Salted.		Dry.	Salted.					
1867. . . . .	12,814	295,084	825	58,804	68,825	5,658	697	106	608	122,800	60,965	150,000
1868. . . . .	1,690	373,240	2,999	75,958	69,955	9,568	....	2,742	393	171,050	192,054	98,600
1869. . . . .	4,948	807,524	1,400	42,592	70,118	9,014	....	7,050	710	184,290	86,011	158,900
1870. . . . .	27,781	411,267	6,208	76,982	104,737	25,618	6,955	16,702	3,694	418,600	59,820	138,000
1871. . . . .	16,754	398,817	5,204	82,017	149,845	14,870	1,877	29,985	7,719	375,500	141,796	190,800
1872. . . . .	24,238	813,264	650	46,727	91,419	25,058	....	96,206	23,129	588,500	189,793	61,627
1873. . . . .	40,547	405,887	1,200	19,962	73,822	22,648	5,125	258,417	29,784	396,155	87,645	161,000

The importations of hides at London are not more than one fourth as large as those at Liverpool, but in both places there is a considerable business in "market" hides, as those from domestic cattle are called. The most important hide market on the continent of Europe is Antwerp. A summary statement of the trade there for the five years ending with 1873 shows the business in South American hides to have been as follows :

	Imports.	Exports.		Imports.	Exports.
1869...	925,838	250,182	1872..	1,181,418	250,619
1870...	1,188,222	235,074	1873..	1,523,951	421,792
1871...	1,068,223	277,897			

The difference between the exports and imports shows the number of hides, nearly all for the manufacture of heavy leather, which are supplied from this port for the use of German tanners. The calf skins used by the French and German tanners are nearly all furnished from domestic stock; as a rule, all animals are better cared for there than here, and the skins are more carefully taken off, which affords a partial explanation of the superior quality of French and German finished calf skins.—*Tanning Materials.* Tannic acid is found in almost every plant which grows, and its use in making leather dates back as far as we have any records, and is attested in every sample of ancient leather extant. Among the sources of tannic acid, oak bark has the first place, although in the United States the bark of the hemlock is used even more than that of oak. Hemlock bark makes red leather, because of an excess of coloring matter, from which oak bark is comparatively free. Oak-tanned leather always brings a higher price than hemlock-tanned, because the coloring matter and resin which are to some extent imparted to the latter have a tendency to make it harder and more brittle, and also because of a prejudice against the red color, pure oak leather being often nearly white; but these points are not of so much importance as the fact that, because oak bark costs more, greater care is taken in the selection of the hides and the finishing of the leather. As for the astringent principle of the bark, which unites with the gelatine and fibrine of the hide to constitute leather, there is no difference between that in oak and that in hemlock bark. The same cannot be said of all tanning substances, for chemists have not yet very closely defined what tannic acid is; and while leather tanned with terra japonica, and some other kinds of concentrated tanning materials, may be restored to a condition very similar to that of raw hide, this cannot be done with bark-tanned leather. To make an accurate analysis of the amount of tannic acid in any given substance is one of the most difficult of chemical experiments; and the results of analyses made by different individuals, and even by the most celebrated chemists, vary so widely that the best informed tanners place

no dependence on the figures thus given. The following table embraces all the principal tanning agents now in use, and is arranged with especial reference to the characteristic qualities that each is conceded to have in the leather manufacture; that is, those coming first in the list, before oak bark, make soft, open, mellow leather, and those which follow oak bark make leather more plump, hard, and brittle. The figures given as showing the percentage of tanning cover only the variations found in excellent samples of the same material:

TRADE NAME.	Percentage of tannin.	Characteristics.
Terra japonica.	42 to 50	Color bad; makes little weight; leather soft and open.
Sumach .....	24 to 33	Color light; gives some firmness; makes leather soft and pliable.
Myrabolams ..	28 to 44	Color yellow; makes little weight; leather mellow.
Oak bark .....	11 to 13	Nearly colorless; gives good weight; makes leather very firm and sold.
Hemlock bark.	11 to 13	Color red; gives good weight; makes leather firm and hard.
Valonia .....	34 to 40	Color fair; gives weight; makes leather hard.
Dividivi .....	26 to 50	Color poor; gives great weight.
Mimosa bark ..	24 to 36	Color very red; gives weight; makes leather hard and brittle.

Of the above named tanning materials, a comparatively small amount is used in the American leather manufacture of any except oak and hemlock bark, and sumach, which is used principally in the tanning of goat skins. Hemlock bark is generally found north of the central portion of Pennsylvania, while south of that latitude most of the oak bark is used. In the northwestern counties of Pennsylvania, the northern counties of New York, W. and N. of Lake Michigan, and in Maine and Canada, are now found the principal hemlock forests, which it is estimated will furnish ample tanning materials for at least 50 years to come. Along the Cumberland and Alleghany mountains, and all the lesser ranges of the Blue Ridge through the southern states, are large supplies of oak bark. Maryland and Virginia since 1865 have furnished a large amount of sumach, which, however, is not so highly esteemed as that grown in Sicily, whence considerable importations are made annually. Besides the bark used directly for tanning at or near the localities where it is peeled from the tree, no inconsiderable amount is used in the United States and Canada for the manufacture of bark extract. This is a process of leaching the bark and then evaporating the principal portion of the water, so that a concentrated solution of tannin is made, which may easily be shipped to distant tanneries; and much of this extract has found a ready market in England within the past five years. It has been a favorite idea with some who are well informed in the business that this trade will ultimately be very large, as oak bark costs in England from £6 to £7 a ton, and the cost of the extract delivered there is only about half as great; but prac-

tical difficulties have thus far prevented the expected growth of this business. The following table represents the imports of the principal tanning materials at Liverpool, England, from 1867 to 1873 inclusive:

YEARS.	Mimosa bark.	Valonia.	Dividivi.	Gambir.
	Tons.	Tons.	Tons.	Tons.
1867.....	....	3,060	1,500	4,586
1868.....	....	12,727	2,845	6,918
1869.....	700	9,250	2,866	5,676
1870.....	1,200	10,450	1,251	8,917
1871.....	2,500	11,690	3,000	7,953
1872.....	1,600	14,216	4,613	9,584
1873.....	1,500	10,016	2,200	7,582

These tanning agents all make cheaper leather than is made with oak bark, and one which is inferior also to that made with hemlock bark; and many devices are resorted to, in the composition of the different tanning agents, and in the process of manufacture, to give the leather a bark-tanned appearance. When the work is skilfully done, the leather is of most excellent quality. On the continent of Europe copice, spruce, and willow bark, as well as the wood of the chestnut, are used for tanning; but these substances have very little tannic acid, and the small home supplies of oak bark, with importations of the above named materials and sumach, constitute the principal agents for converting raw hide into leather. Many other substances besides tannic acid may be used to preserve hides and skins and fit them for certain uses; but these do not make leather which will resist moisture or retain its flexibility and softness after frequent wetting. The most extensively used of these is alum, so that the term alum-tanned leather has become a common designation both in Europe and the United States. With this agent is tanned a large proportion of the sheep skins, and lighter glove leathers from deer, lamb, kid, and other skins.—*Tanning.* As the making of sole leather involves the placing of the greatest amount of tannic acid in the hide, this branch of the business most requires a thorough knowledge of the principles of tanning; for in the manufacture of upper leather as much depends upon the currying and finishing of the stock as upon the tanning, and it is not sought to put the greatest possible amount of tannin in the hide. The hide or skin is composed of two parts: the epidermis or cuticle, in which the hair is imbedded, and the corium or cutis, the true skin, made up of numberless fibres interlacing in every direction, the interstices being filled with a matter which renders the skin flexible, and renews the substance of the cuticle, and which, as well as the fibres themselves, is shown to be almost pure gelatine. The chemical analysis of dried skin is as follows:

Fibrous matter.....	74.42
Uncoagulated albumen.....	3.49
Extractive matter soluble in water, insoluble in alcohol.....	17.44
Extractive matter soluble in alcohol.....	2.82
Fatty matter and loss.....	2.83

The object of tanning is to combine this fibrous and gelatinous matter with tannic acid, and the first process is to wash and cleanse the skin, making it thoroughly soft, and as nearly as possible in the condition it was when taken from the animal. For this purpose the hides are first placed in "soaks," or vats of pure water, where they remain from five to ten days if dry, and about 24 hours if green. Much depends upon the condition of the hide. A dry hide which has been imperfectly cured could not be permitted to remain so long in the soak, as it might begin to decay. When the hide is thus softened, it is ready for the treatment which is necessary to remove the hair. For this purpose there are two principal methods, of acknowledged efficiency and in almost universal use, besides scores of other methods which have their advocates, but have never been generally adopted. The object is so to soften and swell the hide on the surface, where the roots of the hair are imbedded, that the hair can be easily and quickly removed, and the condition of the hide remain as nearly as possible unaltered. To effect this, liming and sweating are the principal methods; the former being used almost altogether for upper leather, and largely for sole leather, and the latter almost exclusively for sole leather. Great differences of opinion exist as to the amount of lime which should be used; if the lime vat is very weak, a longer time is required to swell the epidermis so that the hair can be easily removed; and if more lime is used, there is danger of burning. The true theory is that the lime shall remove all but the gelatine and fibrine; and in upper leather, as well as in belting and harness leather, the removal also of a portion of the gelatine by the lime tends to make a more flexible leather, with all the strength and toughness that it would have with all the gelatine of the hide remaining to unite with the tannic acid, but with less solidity. The sweating process for the removal of the hair is used in the United States and in Germany on nearly all sole leather stock. In Germany and England the warm sweat is generally followed, and in the United States the cold sweat; the former being at a temperature of about 100° F., and the latter from 50° to 65°. The hide after the soaking is cut through the middle of the back, if intended for sides, as is usual in America, or is rounded by cutting off the pates, bellies, and flanks, if to make butts. It is then generally put into a hide mill, to further soften it and help to loosen the hair. This hide mill is a simple contrivance, with two arms working in a box to pound the hides, on which a small stream of water is kept flowing. For the cold sweating process the hides are hung in a close vault, and here it is necessary to watch them very narrowly, as the change which has been commenced in the soaks proceeds much more rapidly here. The sweat pits are nearly all under ground and dark (though the light is proved to be not detri-

mental to the process), and the air is heavily charged with moisture and the ammonia from the hides. The time required to loosen the hair is from one to six days, according to the condition of the hide; but it is of great importance that the hide be removed as speedily as possible after the hair will slip, as it is then in the incipient stages of a very rapid decay. From the sweat pit the hides are first milled, with the water running on them, to soften them further and remove the hair, and then worked over a beam, to take off any remaining hair; they are also, by the more careful tanners, worked on the flesh side to take off any extra flesh or fatty matter which butchers almost always leave on, and then thoroughly rinsed. By the warm sweating process the same ends are obtained, and in about the same time, though it is with greater danger from more rapid decay in unsound hides. Another object to be attained in this stage of preparing the hide is the swelling or distending of its fibres, to allow of the free admission of the tannin to combine with the gelatine in the cells. When lime is used to unhair, it opens the pores of the hide very effectually, but the lime itself must also be thoroughly removed afterward; this is most commonly done by soaking the hide in what is called a *bate*, made of hen dung or similar excrement, aided by subsequent thorough washings in water. The swelling of the hide to allow the tanning liquors to enter the pores freely has no little influence in determining the quality of the leather. Some means to effect this are always necessary in tanning hides which have been un-haired by sweating. There are two methods generally followed in America in preparing sole leather, which illustrate the principles adopted by all tanners. These are commonly called the "acid" and "non-acid" processes. In both methods it is acid that plumps the hide and distends its fibres for the reception of the tan liquor; in the former process, however, a mineral acid is used, either alone, with a large proportion of water, or in connection with more or less of the vegetable acid furnished by the old, sour liquors, to hasten the process of preparing the hides for the tanning proper; while by the latter process the hides, after being un-haired, are handled for several days in the old, sour liquors, but without the aid of the mineral acid (which almost invariably consists of vitriol or sulphuric acid), to effect the same object, that is, distend the fibres and open the pores. In using the vitriol, great care must be observed in the first stages, or the leather will be very dark, and have what is called a very poor grain, *i. e.*, will not make a light-colored bottom for boots and shoes, an object which is very much sought after in all sole leather. The leather is also more likely to be hard and brittle than that prepared by the non-acid method. The old liquors used in the latter method are simply the tanning liquors which have become weak by use, and

in which the remaining tannic acid has largely been changed to gallic acid by exposure to the air.—The grinding of the bark and the making of the liquors therefrom is a most important part of the work. The bark is stripped from the tree and cut in pieces 4 ft. long; a month or two is generally sufficient to make it dry enough to grind, though if kept two years in a large, close pile, and not much exposed to wet, it will not be materially injured. It is ground in a large mill, not unlike a coffee mill in principle; and about the size of a grain of wheat is considered the proper degree of fineness. To get the tanning principle from the ground bark, leaching with hot water is prejudicial, for in that way resin and coloring matter are also extracted; and leaching with cold water does not extract all the tannin. Both modes are used. Leaching with hot water, or swelling the ground bark with steam before leaching, causes the leather to be darker than that made with liquors which are leached cold.—The vats in which the hides are handled and laid away in tanning are of various sizes, either large enough for whole hides or for sides, and are about 6 ft. deep. In handling, the hides are sometimes sewed together at the ends, so that they can be reeled from one vat to another; but this is only to facilitate the work in the frequent changes which have to be made. For the first few days the hides are changed every two or three hours from one liquor to another, the first liquors being very weak, and the last liquors in which the hides are thus handled, at the end of 10 or 15 days, having 10 or 12 degrees of strength. From the handlers the hides are placed in what are called *layaway vats*, a shovelful of ground bark on the top of each hide, and the whole covered with the bark liquor. It is the custom in America thus to lay away the leather in vats six or seven times, the liquors of the first layaway being the weakest, and the time the leather is allowed to remain, as well as the strength of the liquors, being increased with each successive laying away. For the first layaway a liquor of 10 or 12 degrees would be used, and the time would be from one to two weeks; for the second, 15 to 20 degrees, and two to three weeks; for the third, 20 to 22 degrees, and three to four weeks; for the fourth, 24 to 26 degrees, and four to six weeks; for the fifth, 28 to 30 degrees, or stronger, and the time in this layaway, or for the sixth and seventh, depends on the judgment of the tanner, the quality of the hide, and the kind of leather to be made. This process, taking about four months, is a fair average of time consumed in America for the actual tanning part of ordinarily heavy hemlock sole leather. Oak tanners generally lay away the leather in bark and strong liquors for a little longer period, and this is also done with all extra-heavy hides. The leather is also much more advanced in the handlers in some cases, and on the proper and thorough opening of the pores here, and the

exercise of great care to prevent the tanning from going on too rapidly on the surface, depends the question whether a longer laying away in the bark liquor will add to the weight of the leather. The object in all sole-leather tanning is to get as great weight as possible, where this can be done without detriment. From dry hide about 170 lbs. of leather are made of 100 lbs. of hide; in some cases the writer has seen 195 lbs. of leather made from 100 lbs. of hide; but many poor tanners will make as low as 140 to 150 lbs. In tanning green or wet hides, from 45 to 60 lbs. of leather for 100 lbs. of hide represents about the average production.—The common prejudice that quick tanning is necessarily poor tanning has no sufficient foundation. The best English tanning, many years since, occupied from nine to 18 months, but the great majority of English tanners now tan in from four to six months. They are also, where *valonia*, *dividivi*, *myrabolams*, and *terra japonica* are used, able to make good leather in even a much shorter time. The problem is to feed the tannin as quickly as possible, without too much expense, to every cell and interstice of the hide; and by constant handling and agitation of the hide in liquors of the proper strength and proportioned to its condition, the work which formerly occupied months is now done in weeks, and could be done in days or even in hours if the extra expense incurred in this way were not greater than the profit to be derived from thus expediting the process. Among the many ways of quick tanning proposed, and which have found no small favor in the trade, are the vacuum process for sole and upper leather, and the revolving wheel or drum for upper leather and calf skins. The former proceeds on the principle of pumping out the air, as from a receiver, from the vat in which the hides are placed, and then letting in the tanning liquors; it is asserted that the pores of the hide are then more open, and the tannin will be more quickly taken up. The wheel or drum for upper-leather and calf-skin tanning is a box nearly filled with a strong tan liquor and the skins, and made to revolve on a shaft, thus constantly agitating the skins, and producing an opening of the pores which facilitates the absorption of the tannin. Neither of these methods, however, has been generally adopted, though each has found favor and is used to a limited extent.—After the leather comes from the last layaway vat, it is scrubbed with a coarse brush, operated either by hand or power, and hung up to dry. Care must be taken at this stage not to hang up the leather where there is too much light, which gives a dark color, and also to have as far as possible a constant circulation of dry air. After drying, the leather is "sammied," as it is called, or slightly moistened and oiled on the grain side, by which it is brought to a flexible, mellow condition, ready to be rolled or hammered, the final process of finishing. In America and

England all sole leather is rolled, while in France and Germany it is generally hammered. The sole leather roller commonly used is of brass, about 5 in. in diameter and from 7 to 9 in. long; it is hung like a pendulum over a solid metal bed with a concave face, in which the roller is worked by means of an arm attached near the lower end. The desired pressure is attained by means of a treadle which raises the bed. A rubber packing is sometimes used under this bed to prevent the pressure from coming too hard upon parts of the side or hide which may be naturally too thick or plump to receive the tremendous weight which can be brought upon it.—In making belting and harness leather, where greater flexibility and the greatest possible tensile strength are sought, the methods of tanning are not essentially different. There is very little difference in the texture and appearance of leather which will wear best for the soles of boots and shoes, and that which will serve best for band leather; and most of the heavy harness leather, if well stretched and finished with less oil or stuffing, would make good belt leather. But in the best belt leather, the original fibre of the hide must be as little disturbed as possible. An examination with a microscope of the edge of an ordinary piece of sole or belting leather will show how these fibres are interlaced; and, when not disturbed, this constitutes the great strength of a raw hide. In the tanning and finishing of harness leather, the object is to make the stock still lighter than belting leather, and also to give it much more body and strength than any leather which is to be used for the uppers of boots and shoes. With this end in view, the hides are kept longer in the lime, by which more of the gluten is exhausted, and a higher degree of care is consequently necessary to insure the thorough working out of the lime, which would cause the leather to crack, or be hard and brittle.—In the tanning of upper leather and calf skins the time occupied is very much shorter than that used in making sole leather, and the processes embrace a great variety of methods of handling, agitating with a wheel, suspending in vats of tan liquors, &c. Greater care is necessarily taken in selecting and fleshing the skins; and if the lime used to unhair is not thoroughly worked out, the leather will crack quickly. The currying consists in the thorough working of the skins to soften them, blacking, and thoroughly incorporating the oil and tallow used for stuffing. The latter is generally done in a wheel heated by steam. The blacking is usually of oil, lampblack, and tallow, with a little tan liquor; a cheaper blacking is made of sal soda, lampblack, and soap. Leather finished on the grain or hair side is called grain leather; and imitation grain is made of split leather, which is worked by hand or machine to give its surface the rough look always found on leather finished with the natural appearance on the hair side. Buff leather is where this surface is smoothed off. "Leath-



er board," made of leather skivings and old rope, is manufactured for use in heels, stiffenings, and counters of the cheapest boots and shoes.—Japanned leather, generally called patent leather, was first made in America by Seth Boyden of Newark, N. J., 1818-'20. A smooth, glazed finish was first given to calf skins in France, which were sold to a considerable extent in the American market; but the manufacture of japanned leather has now grown to be a large business in Newark, and the amount of these goods imported is very light. The japanning of calf leather for boots and shoes is most successfully conducted by the French. They furnish the best of the highly glazed brilliant material known as patent leather, and large quantities were formerly produced in the United States. Of late the demand for the finer kinds of calf patent leather has largely fallen off, and its place is in some measure filled by a cheaper article manufactured mostly of kips or larger hides, split or skived down to proper thickness. It is curried expressly for this purpose, and particular care is taken to keep it as free as possible from grease. The skins are then tacked on frames and coated with a composition of linseed oil and umber, in the proportion of 18 gallons of the former to 5 oz. of the latter, boiled till nearly solid, and then mixed with spirits of turpentine to the proper consistency; lampblack is also added when the composition is applied, in order to give color and body. From three to four coats of this are necessary to form a surface to receive the varnish; they are laid on with a sort of knife or scraper. To render the goods soft and pliant, each coat must be very light and thoroughly dried between each application. A thin coat is afterward applied of the same composition, of proper consistence to be put on with a brush, and with sufficient lampblack boiled in it to make it a perfect black. When thoroughly dry it is cut down with a scraper having a turned edge, when it is ready to varnish. The principal varnish used is made from linseed oil and Prussian blue, boiled to the thickness of printers' ink. It is reduced with spirits of turpentine to a suitable consistence to work with a brush, and is then applied in two or three separate coats, which are scraped and pumiced until the leather is perfectly filled and smooth. The finishing coat is put on with especial care in a room kept closed and with the floor wet to prevent dust. The frames are then run into ovens heated to about 175°. In preparing this kind of leather the manufacturer must give the skins as high a heat as they can bear in order to dry the composition upon the surface as rapidly as possible without absorption, and cautiously so as not to injure the fibre of the leather.—Enamelled leather, now used for carriage tops, was first manufactured by David Crockett of Newark; previous to this, oil-dressed leather, presenting all the appearance of harness leather, was used for this purpose. This leather is all split by machine, and only

large hides are used. By the use of the leather-splitting machine, a hide is split in three or four parts, and what in the old process of shaving would have produced but 50 ft. of leather, is increased to about 125 ft. suitable for glazing, besides a first split that is used for covering trunks. Patent leather differs from enamelled leather in the fact that the former has a smooth surface, and the latter is finished with less composition, leaving the irregular surface given by the natural grain of the skin where the hair has been removed. In enamelled leather American manufacturers take the lead of all others, but they also make much poor stock. The principal cause of complaint against American enamelled leather has arisen from the introduction of powerful stretching machines, by which the size of the hide can be increased from 3 to 7 sq. ft. (The leather is sold by measure, not by weight.) The wet leather is thrown over a bar which is attached to uprights and can be raised or lowered at will; the edges of the hides are attached to a fixed bar, and by the use of two jack screws the movable frame is raised until the leather is stretched to its utmost. The whole frame is then wheeled into a dry room, where it remains until the leather is perfectly dry, after which it passes through the usual process of blacking and varnishing. Hides treated in this way will shrink more rapidly than those stretched in the usual manner; they will even contract if spread out in the ware-room. Smaller hides are now used for this purpose than formerly, as they retain the enamel surface better owing to their finer grain, and do not shrink so much when exposed to the weather.—Alligator leather was first made about 1855 in New Orleans. In 1870 a much better article was made in Massachusetts, the tanning process occupying about eight months, and a number of firms then engaged in the business. The leather thus made was very costly, and while it was not impervious to water, as was asserted, it had not sufficient firmness to retain its shape when made up into boots and shoes, but would spread out, in ordinary wear, as would be the case with a buckskin upper of a boot or shoe. The irregular and conspicuous checkered pattern of their surfaces made them popular for a brief period; but nearly all of the durable boots of this kind were made with a lining of calfskin, thus rendering them extremely heavy. In preparing the skins for tanning, great care is necessary to prevent the rotting of the tender crevices between the scales; and, as they must be very carefully treated, twice as much time is required for the tanning and finishing as with calf skins. The skins of the young animals only are fitted for making leather, as the hide of a full-grown alligator is too hard and horny to be of any value. The tanning of alligator skins is, in other respects than those mentioned, similar to that of calf skins. The back of the skin, which is always hard and horny, is generally cut out before shipment, leaving only

about two thirds of the whole for use.—Russia leather, such as is used in pocketbooks, travelling bags, &c., has long been highly popular in the United States and Europe, not only for its durability, but more especially for its peculiarly pleasant smell, which it retains after years of use and exposure. For these reasons it has always commanded a high price, and many American manufacturers have striven hard to make a close imitation of the genuine article. The leather is made of the ordinary Russian hides, which, as is the case in all cold climates where the pasturage is generally poor, are large and thin. These hides are tanned by a very slow process, generally in the weak liquor of the willow bark, which contains not more than 2 or 3 per cent. of tannin. The leather has very little of the positive bark smell which may always be noticed in more thorough or more rapid tannages; but to give it the particular odor by which it is distinguished, what is called "birch bark tar" is used. The exact manner of using this tar, which is said to be simply a condensed extract of birch bark, is held as a secret by the principal manufacturers in Russia, each one of them having especial modes of their own; but it is certain that they all depend upon this as the means of giving the peculiar odor which characterizes Russia leather. The willow bark used in tanning gives a different color from any other tanning material, and it is supposed that in the finishing process the leather is laid away, after a liberal application of the birch bark tar, to become thoroughly impregnated with its peculiar odor.—The importance of the leather industry in the United States, considering the amount of capital and labor employed in all its departments, is next to that of agriculture. It is doubtful whether it holds this relative position in England, where the iron and cotton and wool interests are so large, or on the continent of Europe, where the consumption of leather in proportion to population is much less than in the United States. In all other parts of the world besides the United States and British North America, the British islands, eastern and southern Europe, and Australia, the production of leather is comparatively very small, and the product inferior; the raw hides and skins from the excluded sections form no small proportion of the stock from which leather is made in the countries named. The most complete statistics of the leather industry of the United States yet gathered were presented to congress in 1870, as made by Special Revenue Commissioner David A. Wells. The values created by the leading industries are computed as follows: agriculture, \$3,282,950,000; railroad service, \$360,000,000; leather manufactures, \$222,600,000; iron production, \$119,950,000. The value of leather tanned and of leather manufactures, the number of hands employed, and the amount added by labor to the value of the products, are given as follows:

Value of leather tanned and dressed.....	\$124,760,069
Deducting value of hides and skins used as raw material .....	66,581,114
Value added by labor.....	\$58,228,955
Value of boots and shoes produced .....	\$246,252,000
Deduct value of all materials used, including leather.....	180,169,008
Added value of boot and shoe industry.....	\$116,082,992
Value of other manufactures of leather, harness, hose, belting, bags, portemonnaies, &c. ....	\$69,300,000
Deduct value of materials, including leather.	15,000,000
Added value of above industries.....	\$48,300,000
Number of hands employed in the manufacture of leather.....	80,000
Employed in manufacture of boots and shoes .....	181,838
Employed in other manufactures from leather.....	19,000
Total .....	180,888

## RECAPITULATION.

Value added to hides and skins in the manufacture of leather.....	\$58,228,955
Value added in manufacture of boots and shoes .....	116,082,992
Value added in other manufactures from leather.....	48,300,000
Total added value.....	\$222,611,947

The value of product in the manufacture of leather is apportioned as follows:

Raw material.....	\$66,581,114
Supplies and repairs.....	24,328,955
Labor .....	20,000,000
Capital.....	18,900,000
Total .....	\$124,760,069

The value of the product of the boot and shoe industry is apportioned as follows:

Raw material.....	\$180,169,008
Supplies and repairs.....	9,873,959
Capital .....	24,625,000
Labor .....	52,058,438
Total .....	\$246,252,000

The above statistics were made on a basis of currency prices, with gold at 25 per cent. premium. By far the larger proportion of the industry to which these figures relate is carried on east of the Alleghany mountains; and while the leather manufacture is of no slight importance in Kentucky and the states north of the Ohio, comparatively little is done in this business anywhere on the Pacific slope. The leather made in all the New England states, and a large portion of that made in New York, finds its principal market in Boston, which is the leading upper-leather market in the United States, and does a large business in sole leather. The following comparative statement, including receipts from New York city, and receipts of rough leather which is sent again to the tanneries nearer Boston to be finished, and thus appears twice in the receipts, represents the business of that city:

TOTAL RECEIPTS, 1863-1873.

	Sides.		Sides.
1863.....	2,700,000	1869.....	3,700,000
1864.....	2,600,000	1870.....	4,000,000
1865.....	3,400,000	1871.....	4,700,000
1866.....	3,600,000	1872.....	5,400,000
1867.....	3,400,000	1873.....	5,600,000
1868.....	3,700,000		

New York is the principal market for sole leather and imported calf skins, kids, &c. Nearly all the sole leather received there is hemlock-tanned, which probably constitutes three fifths of the leather tanned in the United States. The receipts of sole leather at New York for the year 1873 were about 4,500,000 sides, and for 1872 not less than 5,000,000 sides. Philadelphia does a large business in oak sole and domestic tanned and finished calf and goat skins. Baltimore and Cincinnati are of considerable importance as oak-leather markets. Buffalo and Chicago have each a large trade in hemlock leather, and are supplied by the tanneries in their immediate neighborhood. There are some considerable tanneries of hemlock leather in Canada and Nova Scotia, the leather finding its market mostly among the shoe manufacturers there; the remainder is principally exported to England. Very little of it comes to the United States, owing to the tariff, which was formerly 25 per cent., and is now (1874) 10 per cent. on sole leather. Since 1840 American tanners have frequently attempted to supply the English market with sole leather. The hemlock bark principally used for tanning in the United States costs from \$4 to \$6 a cord, weighing about 2,000 lbs. The English oak bark costs about \$30 a cord, and the amount of tannin it contains is very little greater than that in American hemlock of average growth. As the cost of bark is a leading consideration in the leather manufacture, and the difference in the cost of labor was not very great, it was thought that the American tanner had a very decided advantage over his English competitor. Yet it has taken many years of experiment for the American tanner to obtain any considerable degree of success in this matter. Shipments have not been successful until within the past two or three years, or since the removal by congress, from Aug. 1, 1872, of the 10 per cent. duty on foreign hides brought to the United States. English manufacturers at first complained that American hemlock leather, being red, was not tanned, but only colored; then that American leather was not so neatly finished, fleshed, and trimmed as that of English make; and this still holds good, so that American hemlock leather, although its substantial qualities are now recognized by the leading English manufacturers of boots and shoes, is sold there only as an article inferior to their best leather, and at a much lower price, but better than the poorer qualities of which the greater portion of their production consists. The following

are the shipments of sole leather from New York to various ports for 1873:

To Liverpool.....	885,756 sides.
" Hamburg.....	218,152 "
" Bremen.....	43,372 "
" London.....	82,448 "
" St. John's.....	3,852 "
" Curaçoa.....	8,984 "
" various ports.....	20,254 "
Total.....	707,919 "

During the year ending June 30, 1873, \$4,612,-885 worth of leather was exported from the United States, and \$6,766,202 imported. About three fourths of this commerce passes through New York.—The leather manufacture of Great Britain is one of its most important industries. English sole leather has long had the reputation of being the best in the world, and its better grades are superior to any other manufactured, if we except a few tannages of similar leather made in the United States. With the increasing demand for leather, however, and the diminishing supply and advanced prices of bark, a poorer quality has largely taken the place of the prime leather which gave English tanners their extended reputation. The following extracts from the latest government returns show the imports and exports:

IMPORTS.

ARTICLES.	1873.		1872.
	Quantities.	Value.	Value.
Hides, raw, cwts.....	1,389,373	£4,727,126	£4,919,262
" dressed, lbs.....	31,617,996	1,973,535	1,781,924
Boots and shoes, pairs.....	433,643	146,731	151,213
Gloves, pairs.....	11,630,544	1,296,732	1,403,622
Other manufactures.....		189,259	130,209

EXPORTS, PRODUCE OF UNITED KINGDOM.

Hides, raw, cwts.....	45,249	122,001	112,325
" dressed, cwts.....	116,445	1,043,909	1,220,931
Boots and shoes, pairs.....	6,332,323	1,707,856	1,693,243
Saddlery and harness.....		455,132	365,559
Other manufactures, lbs.....	1,665,109	804,398	876,441

EXPORTS, FOREIGN AND COLONIAL PRODUCE.

Hides, dry and wet, cwts..	392,691	1,491,258	1,638,957
" tanned, dressed, &c., lbs.....	3,955,261	243,081	265,193

The principal leather market of Great Britain is at Leeds, and at the quarterly and intermediate fairs held here representatives of the principal tanners and leather and hide factors of Great Britain are always to be found. London and Liverpool are also extensive markets. Bristol, Manchester, and Newcastle have each a large business in leather and the shoe manufacture.—On the continent of Europe the sole-leather manufacture is of minor importance, compared with the extent of the industry in England and America, while the manufacture of calf skins, kips, kid skins, morocco, and all kinds of upper leather, is carried on very largely and with great success. The sole leather tanned on the continent of Europe is generally hard and brittle, from an insufficiency of tanning material, and a long process of tanning; but the calf skins and upper leathers, which require but

little tanning material and much hand labor in working, are as a rule far superior to those made in England and America. For this reason, the two latter countries are large customers for these goods, and export in return a large proportion of the sole leather used in Europe. Paris is the headquarters of the French calf-skin business, and Milhau is the most important manufacturing centre of the trade in France. At Lyons, Nantes, and Chaumont near Beauvais, the trade is also of considerable importance. In Belgium, at and near Brussels, there is quite a large production of calf skins. Switzerland, besides numerous small tanneries, has one of the largest calf-skin tanneries in the world, at Lausaune. In Germany, calf skins, calf kids, and kips are made in large quantities at Mentz, Worms, Oppenheim, Offenbach, Dresden, near Frankfort, and near Freiburg, besides innumerable small tanneries everywhere.

**LEATHES, Stanley**, an English theologian, born at Ellesborough, Buckinghamshire, March 21, 1830. He was educated at Jesus college, Cambridge, ordained in 1856, and successively curate of St. Martin's, Salisbury, St. Luke's, Berwick street, London, and St. James's, Westminster. In 1863 he was called to King's college, London, as professor of Hebrew; and in 1869 he became minister of St. Philip's, London. He has published able defences of Christian orthodoxy, including "The Witness of St. John to Christ." Several of his apologetics were originally delivered from 1868 to 1870 as Boyle lectures at Whitehall, and in 1873 as Hulsean lectures at Cambridge. In 1874 he held the appointment of Bampton lecturer at Oxford, an honor never before accorded by Oxford to a Cambridge graduate. He is a member of the Anglican revision company of the Old Testament. In the conference of the evangelical alliance in New York in 1873 he was prominent.

**LEAVENWORTH**, a N. E. county of Kansas, bounded N. E. by the Missouri river, which separates it from Missouri, and S. by the Kansas; area, 460 sq. m.; pop. in 1870, 32,444. The surface is undulating, diversified with prairies and timber lands; the soil is fertile. The Leavenworth branch of the Kansas Pacific railroad traverses it, and it is also crossed by the Kansas Central and the Missouri Pacific railroads. The chief productions in 1870 were 31,647 bushels of wheat, 1,133,188 of Indian corn, 193,851 of oats, 295,980 of potatoes, 14,380 lbs. of wool, 254,837 of butter, and 19,796 tons of hay. There were 4,480 horses, 4,701 milch cows, 8,007 other cattle, 3,406 sheep, and 17,435 swine; 11 manufactories of carriages, 10 of clothing, 8 of furniture, 2 of iron castings, 1 of machinery, 4 of marble and stone work, 9 of saddlery and harness, 2 of soap and candles, 6 of tin, copper, and sheet-iron ware, 16 of cigars, 5 breweries, 3 flour mills, and 8 saw mills. Capital, Leavenworth.

**LEAVENWORTH**, a city of Kansas, the largest in the state, county seat of Leavenworth co., situated on the right bank of the Missouri

river, 500 m. above its mouth, 25 m. N. W. of Kansas City, Mo., and 45 m. N. E. of Topeka; pop. in 1860, 7,429; in 1870, 17,873, of whom 4,510 were foreigners and 3,024 colored. It is situated in an amphitheatre formed by the Missouri bluffs, which rise to the height of about 300 ft., and sweep round in the form of a crescent, each horn resting on the river. It covers an area of 6 or 8 sq. m., consisting of gentle rolls or slopes, which furnish admirable building sites and afford good drainage. The city is regularly laid out, with streets extending N. and S. and E. and W., which are mostly macadamized and lighted with gas. The business blocks are chiefly of iron and brick three or four stories high, and there are numerous handsome residences and churches, the Catholic cathedral being one of the largest and finest church edifices in the west. Two miles above the city is Fort Leavenworth, the headquarters of the department of the Missouri and the base of supplies for the western posts; it was established in 1827. The government reservation, which extends 6 m. along the river and 1 m. back, affords good landings for steamboats, and contains large and well built barracks, officers' quarters, storehouses, hospital, stables, &c., and a handsome parade ground. There are no fortifications. The city has an important trade by river and railroad. The river is bordered by a paved levee and crossed by an iron railroad bridge. Six lines of railroad centre here, viz.: the Leavenworth branch of the Kansas Pacific; the Leavenworth, Lawrence, and Galveston; Kansas Central; Missouri Pacific; Chicago, Rock Island, and Pacific; and Kansas City, St. Joseph, and Council Bluffs. There are saw mills, breweries, machine shops, founderies, and other manufactories; two national banks with \$200,000 capital, and two savings banks. Leavenworth is the seat of one of the state normal schools and of the state penitentiary. The public schools are graded, including a high school department, and are in a flourishing condition. In 1872 there were 3,700 pupils. Six daily (two German), one tri-weekly, and five weekly (two German) newspapers, and six monthly periodicals are published. There are 26 churches. Leavenworth was settled in 1854.

**LEAVITT, Joshua**, an American journalist, born in Heath, Mass., Sept. 8, 1794, died in Brooklyn, N. Y., Jan. 16, 1873. He graduated at Yale college in 1810, and, after teaching in Wethersfield, Conn., studied law in Northampton, Mass., was admitted to the bar in 1819, and in 1821 began to practise in Putney, Vt. In 1823 he commenced the study of the theology at New Haven, and in 1825 was ordained pastor in Stratford, Conn. The same year he wrote for the "Christian Spectator" a series of articles against slavery. In 1828 he removed to New York to become secretary of the seamen's friend society. In 1831 he became editor and proprietor of the "New York Evangelist," founded to advocate the new

school opinion in regard to revivals; and he reported for this journal the lectures of the Rev. Charles G. Finney, which were republished in England and translated into French and Welsh. The views advocated in the "Evangelist" led to the formation of the New School Presbyterian church in 1837. He aided in organizing the New York anti-slavery society in 1833, and was a member of its executive committee, as well as of that of the national anti-slavery society in which it was merged. He was one of the leading abolitionists who were obliged to fly for a time from the city to escape mob violence. In 1837 he became editor of the "Emancipator," which he removed to Boston in 1841. He there also issued the "Daily Chronicle," the earliest daily anti-slavery paper. From 1840 he endeavored to form an anti-slavery party, and he was the chairman of the national committee of the liberty party from 1844 to 1847, and supported their nominees for the presidency in 1844, 1848, and 1852. In 1848 he became managing editor of the "Independent" newspaper, for which he continued to write until a few days before his death. In 1819 he organized in Heath, Mass., the earliest Sunday school in that part of the country. He was the first lecturer sent out by the American temperance society, and delivered the first temperance lecture ever given in New Haven. He edited a series of school readers which were largely used, and the "Christian Lyre," the first hymn book published in America with the notes attached.

**LEBANON**, a S. E. county of Pennsylvania, bounded N. W. by Kittatinny or Blue mountain, S. E. by South mountain, and drained by Swatara river and its branches; area, 288 sq. m.; pop. in 1870, 34,096. It consists almost wholly of a valley, and has mines of excellent iron ore in connection with rich veins of copper; slate, limestone, and marble also abound. The soil is very fertile. The Union canal and the Lebanon Valley branch of the Philadelphia and Reading railroad, the Lebanon and Tremont, and the Schuylkill and Susquehanna railroads pass through it. The chief productions in 1870 were 538,304 bushels of wheat, 70,188 of rye, 627,881 of Indian corn, 678,614 of oats, 95,835 of potatoes, 569,199 lbs. of butter, and 41,894 tons of hay. There were 6,895 horses, 9,131 milch cows, 11,763 other cattle, 2,687 sheep, and 13,953 swine; 4 manufactories of boots and shoes, 9 of brick, 19 of carriages, 3 of cars, 39 of clothing, 18 of furniture, 15 of iron, 15 of lime, 1 of machinery, 1 of paper, 11 of saddlery and harness, 15 of tin, copper, and sheet-iron ware, 19 of cigars, 4 breweries, 6 tanneries, 4 currying establishments, 1 planing mill, 4 saw mills, and 14 flour mills. Capital, Lebanon.

**LEBANON**. I. A borough and the capital of Lebanon co., Pennsylvania, on Quitapahilla creek, the Union canal, and the Lebanon Valley and Lebanon and Tremont railroads, 24 m. E. by N. of Harrisburg; pop. in 1850, 2,184; in

1860, 4,449; in 1870, 6,727. It is regularly and substantially built, the houses being mostly of brick or stone. It has an active trade, and stands in the midst of a rich iron-mining district. The Cornwall ore banks, 7 m. S., are three hills, called Grassy, Middle, and Big hill, formed of masses of iron ore. Veins of copper are found among the iron, and 6 m. from the borough a quarry of gray marble has been opened. There are several blast furnaces, machine works, a bell manufactory, a rolling mill, a forge, three planing mills, manufactories of paper, organs, stoves, and hollow ware, three national banks with a capital of \$350,000, a state bank, and two savings banks; one daily and six weekly (two German and one English and German) newspapers, a library, 14 churches, and 35 schools. II. A town and the capital of Wilson co., Tennessee, on a branch of Cumberland river, at the terminus of the Tennessee and Pacific railroad, 31 m. E. of Nashville; pop. in 1870, 2,073, of whom 917 were colored. It contains two national banks, manufactories of cotton and woollen goods, and a weekly newspaper. It is the seat of Cumberland university, founded by the Cumberland Presbyterians in 1842, which now embraces preparatory, commercial, engineering, collegiate, theological, and law departments. In 1873-'4 there were 70 preparatory, 104 commercial, 2 engineering, 94 collegiate, 47 theological, and 87 law students; total, deducting repetitions, 352. The whole number of professors and instructors was 12; number of volumes in the library, 6,000. The collegiate department embraces a classical and a scientific course. A post-graduate course has been arranged, upon the completion of which the degree of master of arts is conferred. III. A town and the capital of Marion co., Kentucky, on Hardin's creek, and on a branch of the Louisville, Nashville, and Great Southern railroad, 5 m. from Rolling fork of Salt river, and 43 m. S. W. of Frankfort; pop. in 1870, 1,925, of whom 823 were colored. It contains two banks and a weekly newspaper. It is the seat of Lebanon female college (Baptist), established in 1869, which has 4 instructors and 50 students. At St. Mary's station, about 5 m. distant, is St. Mary's college (Roman Catholic), which has 14 officers and instructors and 108 students. IV. A village and the capital of Warren co., Ohio, on Turtle creek, a branch of the Little Miami river, 30 m. N. E. of Cincinnati; pop. in 1870, 2,749. It contains a saw mill, two planing mills, a public library, and two weekly newspapers. It is the seat of the national normal school, established in 1855, which in 1874 had 17 instructors, 1,606 students, and a library of 3,000 volumes. V. A town of St. Clair co., Illinois, on the Ohio and Mississippi railroad, 23 m. E. of St. Louis; pop. in 1870, 2,117. It is pleasantly situated, and has several stores, mills, two weekly newspapers, and seven churches. It is the seat of McKendree college (Methodist), chartered in 1835, receiving students of



both sexes. In 1874 it had 7 instructors, 67 preparatory and 149 collegiate students, and a library of 8,000 volumes. A semi-monthly periodical is issued by the students.

**LEBANON, Libanus, or Jebel Libnan** (the white mountain), the western of two mountain chains in Syria which are thrown off from the S. E. continuations of the Taurus range, and extend S. S. W. almost parallel with the coast. The eastern of these ridges is called Anti-Libanus, Anti-Lebanon, or Jebel esh-Shurki. The Lebanon is the higher of the two, its average altitude being estimated at 7,000 ft., while its culminating peak, according to Burton ("Unexplored Syria," 1872), is Jebel Timarun, 10,533 ft. high. On its W. side the chain sends off several spurs which traverse the narrow strip of coast, which in antiquity was Phœnicia, and terminate at the Mediterranean in bold promontories. On the east lies the valley of Cœle-Syria, now called El-Bukaa, which separates this range from Anti-Libanus; it is nearly 100 m. long and from 10 to 20 m. wide. It is not properly a valley, because it undulates between elevations of 2,000 and 3,000 ft. S. of it lies the valley of the Jordan, the most important of the rivers of this mountain system. The next largest are the Aasy (the ancient Orontes), which cuts through the Lebanon at Antakia (Antioch), about lat. 36° 7', and the Litany (Leontes), which empties a little N. of Sur (Tyre). The general geological formation of the Lebanon is carboniferous and mountain limestone, the whiteness of which is said to have given to the range its name (Heb. *laban*, white). The rock is very porous, and has been worn by the action of air and water into numerous caves and hollows, which once sheltered the persecuted Jews and Christians. Graywacke, slate, basalt, and other igneous rocks, granite, gneiss, dolomite, iron, and coal are also found. Mines of the last two minerals are worked to some extent. The scenery of the mountains when viewed from the sea or plains is in the highest degree picturesque; but on a nearer approach little is presented to interest the traveller except rugged ravines and dangerous precipices. The vegetation is scanty, although here and there appear pleasant groves, of which the famous cedars of Lebanon form the most remarkable part (see CEDAR), and good pasture grounds to which the Arabs resort in summer. The lower parts of the range, however, are exceptions to these remarks; they are well watered and cultivated, and their valleys contain orchards, vineyards, mulberry plantations, and grain fields. Olives, almonds, oranges, and citrons are also produced, and on the E. side are scrub oaks. The habitable regions of the Lebanon are chiefly in the possession of the Maronites and Druses. (See ANTI-LIBANUS, DRUSES, MARONITES, and PHœNICIA.)

**LEBANON SPRINGS.** See NEW LEBANON.

**LEBAS, Jean Baptiste Apollinaire**, a French engineer, born Aug. 13, 1797, died in 1873. In 1836 he removed the great obelisk of Luxor

from Egypt to the Place de la Concorde, Paris, as described in his *L'Obélisque de Luxor, histoire de sa translation à Paris* (Paris, 1839). He was keeper of the naval museum of the Louvre, and a member of the board of admiralty, retiring in 1858.

**LE BAS, Louis Hippolyte**, a French architect, born in Paris in 1782, died there in 1867. He became architect of public works, member of the institute, and professor at the school of fine arts, and executed many remarkable works, including the church of Notre Dame de Lorette.

**LE BAS, Philippe**, a French archæologist, born in Paris, June 18, 1794, died in 1861. At the age of 16 he entered the navy, which he left three years later for the army. He shared in the campaigns of 1813-'14, and then leaving the service was employed for six years in the office of a magistrate. In 1820 he was chosen by Queen Hortense to act as tutor to Prince Louis Napoleon, the future Napoleon III., with whom he remained till Oct. 1, 1827. After holding professorships at Paris successively of history and of the Greek language and literature, he was commissioned by the government in 1842 to undertake a tour of archæological investigation in Greece and Asia Minor, during which he made many valuable discoveries. His best known works are his *Explication des inscriptions grecques et latines recueillies en Grèce* (1835-'7), and *Voyage archéologique en Grèce et en Asie Mineure* (1847 et seq., but never completed).

**LEBERT, Hermann**, a German physician, born in Breslau, June 9, 1813. He studied in Berlin and graduated at Zürich in 1834. Subsequently he attended the clinics in Paris, practising his profession in Switzerland during the summer. Orfila employed him in collecting materials for the museum of comparative anatomy. After having perfected his knowledge of surgery under Dieffenbach in Berlin (1846-'7), he resumed his residence in Paris. He became professor at Zürich in 1853, and at Breslau in 1859, retiring in 1874. His principal work is *Traité d'anatomie pathologique générale et spéciale* (2 vols., Paris, 1855-'60, with 2 vols. of illustrations). Among his numerous other writings in French and German are *Recherches cliniques, expérimentales et microscopiques sur l'inflammation*, &c. (2 vols., Paris, 1845), and *Klinik der Brustkrankheiten* (2 vols., Tübingen, 1874).

**LEBLANC, Urbain**, a French veterinary surgeon, born near Bressuire, Nov. 26, 1796. He studied and taught at Alfort, and became in 1832 a surgeon to the prefecture of police in Paris, and in 1852 a member of the medical academy. He established an extensive farriery, and introduced various ingenious methods and instruments into the practice of his profession. He has published, with Trousseau, *Anatomie chirurgicale des principaux animaux domestiques* (Paris, 1839), and with Follin, *Traité de pathologie comparée* (2 vols., 1855), besides other works.

**LEBCEUF, Edmond**, a French general, born in Paris, Dec. 6, 1809. He served in Algeria and

in the Crimea, distinguished himself at the battle of the Alma, and was made brigadier general. In 1857 he became general of division, and in 1859 bore a prominent part in the battle of Solferino. In August, 1869, he succeeded Niel as minister of war, but resigned two months afterward. He resumed the post in January, 1870, in the Ollivier ministry, was made marshal of France in March, and reported very favorably as to the fitness of the French army to engage in a war with Germany. On the day of the declaration of war (July 19) he was appointed chief of staff of the army of the Rhine, though retaining his portfolio. After the first disasters of the campaign he was removed from the ministry, and subsequently served under Bazaine at Metz. For some time he was a prisoner of war in Germany, and subsequently took up his residence at the Hague.

**LE BRUN, Charles**, a French painter, born in Paris in 1619, died there, Feb. 12, 1690. He studied in the school of Simon Vouet, and at the age of 15 produced a picture of "Diomedes devoured by his own Horses." He afterward studied under Nicolas Poussin in Rome, and for about six years devoted himself to the study of the antique and of the old masters. Having returned to Paris, he was in 1648 admitted to the newly founded royal academy of painting and sculpture, of which he subsequently became president. At the recommendation of Colbert, Louis XIV. appointed him his first painter, and conferred upon him the direction of the manufactory of Gobelins tapestry. He painted a grand series of pictures, now at Versailles, illustrating the military triumphs and public works of the reign of Louis XIV., executed in a half classical, half allegorical style, the monarch being represented in a Roman toga with the flowing peruke of the 17th century, and with other incongruities and anachronisms. For the Louvre he painted a series entitled "The Battles of Alexander," which are considered among his finest works, and are well known through the engravings of Gérard Audran. Another of his pictures, "Mary Magdalen washing the Feet of the Saviour in the House of Simon the Pharisee," was so highly esteemed that in 1815 the emperor of Russia accepted it in exchange for the celebrated "Marriage at Cana," by Paul Veronese, now in the Louvre.

**LEBRUN, Charles François**, duke of Piacenza, a French statesman, born at St. Sauveur-Lendelin, Normandy, March 19, 1739, died near Dourdan, June 16, 1824. In early life he secured the protection of Chancellor Maupeou, and after the downfall of his patron occupied himself with prose translations of Tasso's *Gerusalemme liberata*, Homer's Iliad, and other works. A letter advocating political and social reforms, published by him in 1789 under the title of *La voix du citoyen*, brought him into considerable notice, and he was elected a deputy to the states general. As a member of the constituent assembly he opposed the issu-

ing of assignats and the establishment of lotteries. He subsequently became president of the administrative directory of Seine-et-Oise, was twice imprisoned during the reign of terror, entered the council of the ancients in 1795, and after the 18th Brumaire was chosen by Bonaparte third consul. He rendered important services in the adjustment of the finances and the establishment of the court of accounts, and after the coronation of the emperor was created arch-treasurer and duke. He was also at different times governor general of Liguria and of Holland. After the abdication of Napoleon he adhered to the Bourbons; but having accepted the office of grand master of the university under the emperor during the hundred days, he was excluded from the chamber of peers till 1819. His latter years were passed in retirement, during which he finished a translation of the Odyssey.

**LEBRUN, Marie Louise Elisabeth**, a French painter, born in Paris, April 16, 1755, died there, March 30, 1842. Her father, M. Vigée, was a painter, and her stepfather was a goldsmith, who exhibited in his shop her earliest portrait, which attracted much attention. She was patronized by Marie Antoinette, and was a favorite in fashionable society. She was admitted to the academy of painting, from which females were subsequently excluded. Her marriage in 1775 with Jean Baptiste Pierre Lebrun, the art critic and amateur, who died in 1813, was not a happy one, and they lived most of the time apart. In 1789 she went to Italy, where she was received with great distinction, and painted a remarkable portrait of Lady Hamilton in the character of a bacchante. She afterward visited Germany, Russia, England, and Switzerland. While in London (1802-'5) she painted portraits of the prince of Wales and of Lord Byron. She was in Switzerland in 1808-'9, and painted Mme. de Staël as Corinne, one of her best portraits. Notwithstanding many disappointments and reverses, she retained her artistic and social prominence to extreme age, and in her 80th year executed a portrait of her niece, which showed no decline in power. Besides portraits she painted landscapes and several semi-allegorical pieces. She wrote *Souvenirs de Mme. L. É. Vigée-Lebrun* (3 vols., Paris, 1835-'7), which contains lists of more than 650 portraits, 200 Swiss and English landscapes, and 15 other pictures.

**LEBRUN, Pierre Antoine**, a French poet, born in Paris, Nov. 29, 1785, died there in 1873. At an early age he wrote a tragedy entitled *Coriolan*, and other poetical compositions, which secured for him the patronage of François de Neufchâteau, one of the ministers of the directory. For his poem on the battle of Austerlitz he received a pension of 1,200 francs from the government. After the fall of the empire he celebrated the glories of Napoleon in a series of poems. In 1828 he succeeded Count Neufchâteau as a member of the French academy. From 1831 to 1848 he was director of

the royal printing establishment. For some time he was a member of the chamber of peers under Louis Philippe, and in 1853 became a member of the imperial senate. His complete works (5 vols., 1844-'63) include a number of dramas, of which his *Marie Stuart* is based upon Schiller's tragedy of that name.

**LEBRUN, Ponce Denis Écouchard**, a French poet, born in Paris, Aug. 11, 1729, died there, Aug. 31, 1807. He was brought up in the family of the prince de Conti, and as early as his 12th year he began to write verses. His early life was not fortunate, his wife, a beautiful woman, celebrated in many of his poems under the name of "Fanny," having procured a legal separation after a stormy union of 14 years, and his little property having been dissipated by the insolvency of the prince de Guéméné. He avenged himself on his enemies by stinging epigrams and passionate lyrics. Upon the appointment of Calonne as comptroller general of finance, he received a pension of 2,000 livres, and his muse was energetically employed in celebrating the virtues of the king; and after the downfall of the monarchy he sang the praises of the republic. He subsequently ingratiated himself with the first consul, and received a pension of 6,000 francs.

**LECCE. I.** A S. E. province of Italy, formerly called Terra d'Otranto, and forming part of the division of Apulia, though in antiquity it formed the separate division of Calabria or Messapia; area, 3,293 sq. m.; pop. in 1872, 493,594, including about 40,000 Arnauts and Greeks. It is traversed in its entire length from N. W. to S. E. by the Apennines. Among the more important coast rivers are the Lieto and the Galeso. The climate is mild, but the province often suffers from great drought. Among the chief products are corn, cotton, tobacco, wine, and olives. It is divided into the districts of Brindisi, Gallipoli, Lecce, and Taranto. **II.** A city, capital of the province, at the foot of the Apennines, 21 m. S. S. E. of Brindisi; pop. in 1872, 23,247. It is the seat of a bishop, of a prefect, and a tribunal of primary jurisdiction, and has a lyceum, a castle, and manufactories of tobacco and cotton. The Lecce oil, the best kind of table oil, constitutes an important article of trade. During the middle ages Lecce was a county of the Normans; and in 1189 Count Tancred of Lecce became king of Sicily.

**LECH** (anc. *Licus*), a river of Germany, a tributary of the Danube, rising from Lake Formanin in Vorarlberg, Austria, at a height of 6,000 ft., E. of the Rothe Wand mountain (9,000 ft. high). Entering Tyrol, it flows for about 50 m. in an E. N. E. course, along a narrow and sombre valley, to Reute, and thence in a winding course toward the north, between famous ridges and lakes of the Algau Alps, to Füssen, above which it enters Bavaria. Near the boundary it forms a cataract and the finest rapids in Germany. It then flows N., on the confines of Upper Bavaria and Swabia, passing

Schöngau, Landsberg, Augsburg, and Lechhausen, and terminating its course of about 180 m. near a ruined castle in the vicinity of Lechsend. Its principal affluents are the Vils and the Wertach. Owing to the torrent-like velocity of the Lech it is not suitable for navigation. The plain of Lechfeld, between the Lech and the Wertach, extending from Landsberg to Augsburg, was the scene of a memorable victory achieved by the emperor Otho I. over the Hungarians, Aug. 10, 955. In opposing the passage of the Lech, near Rain, by Gustavus Adolphus, Tilly was mortally wounded, April 5, 1632.

**LECHEVALIER, Jean Baptiste**, a French archaeologist, born near Coutances, in Normandy, July 1, 1752, died in Paris, July 2, 1836. He was secretary of legation under Count de Choiseul-Gouffier at Constantinople, and his associate (1785-'6) in exploring the Troad. In 1805 he became director of the library of Ste. Geneviève in Paris. While in England he lived for several years in the house of Sir Francis Burdett, and in Edinburgh he delivered a lecture on Troy before the royal society, which was published in English by A. Dalzel (London, 1791). His *Voyage de la Troade* (3d and enlarged ed., 3 vols. Paris, 1802), gave rise to much controversy; and his *Ulysse-Homer* (Paris, 1829), published under the *nom de plume* of Constant Koliadès, in which he endeavored to show that Ulysses was the author of the Homeric poems, was regarded as absurd. His other writings include *Voyage de la Propontide et du Pont Euxin* (2 vols., Paris, 1800).

**LECKY, William Edward Hartpole**, a British author, born near Dublin, March 26, 1838. He graduated at Trinity college in that city in 1859, taking the degree of M. A. four years later, and from this time devoted himself to political and philosophical literature. His first important work, "The Leaders of Public Opinion in Ireland," was published anonymously in 1861, and attracted immediate attention. It was republished under his own name in 1871-'2. In 1865 he published the earlier of the two works which have chiefly contributed to his reputation, "History of the Rise and Influence of the Spirit of Rationalism in Europe" (2 vols., London; 4th ed., 1870). This was followed by his "History of European Morals from Augustus to Charlemagne" (2 vols., London, 1869). The last named work especially has been widely read, and a German translation of it appeared in 1871.

**LE CLEAR, Thomas**, an American painter, born in Owego, N. Y., March 11, 1818. In 1839 he opened a studio in New York, where his picture "The Reprimand" was purchased by the art union. In 1844 he removed to Buffalo, where he remained painting portraits till 1860, when he established himself in New York. Among his most successful portraits are those of Daniel S. Dickinson, Millard Fillmore, T. B. Thorpe, the artists Gifford, McEntee, and Hubbard, and Edwin Booth as Hamlet.

He has also painted "The Marble-players," "Young America," and "The Itinerants."

**LE CLERC, Jean**, a Protestant theologian, of French descent, born in Geneva, March 19, 1657, died in Amsterdam, Jan. 8, 1736. His ancestors had taken refuge in Geneva, and he was educated under the care of his father, Etienne Le Clerc (1599-1676), and in 1679 was admitted to the ministry, after which he studied at Saumur. In 1682 he preached for some time in London, and subsequently went to Holland. His theological opinions leading to his exclusion from the Walloon church, he became in 1684 professor of literature, philosophy, and Hebrew at the college of the Remonstrants in Amsterdam, and afterward of ecclesiastical history. In 1728 a stroke of paralysis obliged him to retire. He had a protracted controversy with Bayle, chiefly on account of the strictures of the latter upon Cudworth's "Intellectual System of the Universe." He was a man of great erudition, and exerted a wide influence upon the theological opinions of his time. Among his works are: *Bibliothèque universelle et historique* (26 vols., Amsterdam, 1686-'93), in the first 10 volumes of which La Croze assisted him; *Bibliothèque choisie*, &c. (28 vols., 1703-'13); *Bibliothèque ancienne et moderne* (28 vols., 1714-'27), the last volumes of which are by Bernard, and a 29th volume was published in 1730; *Vie du cardinal Richelieu* (2 vols., 1694; often republished); *Commentarii Philologici et Paraphrasis in Vetus Testamentum* (4 vols., 1690-1731); *Ars Critica* (2 vols., 1696; enlarged ed., 3 vols., 1731); and *Parrhasiana*, a series of disquisitions vindicating his opinions (1699; enlarged ed., 2 vols., 1701; English translation, 1700). He also published an autobiography, *Johannis Clerici Vita et Opera* (Amsterdam, 1711; English translation, 1712).

**LECLERC, Sébastien**, a French engraver, born in Metz, Sept. 26, 1637, died in Paris, Oct. 25, 1714. He became proficient in the art of design under the tuition of his father, a goldsmith, and was for some time a geographical engineer, but finally devoted himself to engraving. Colbert placed him at the Gobelins with a pension of 1,800 francs. He was elected to the academy of painting, and was professor of perspective from 1672 to 1702, when he retired on a small pension. He formed his style upon that of Lebrun, improving it, however, by a careful study of Raphael. His published designs include nearly 4,000 subjects, all executed with remarkable correctness and elegance. Among his publications are valuable treatises on geometry, architecture, and perspective.—One of his ten children, LAURENT JOSSE LECLERO (1677-1736), was a professor of divinity, and a writer of some merit.

**LECLERC, Victor Emmanuel**, a French general, born at Pontoise, March 17, 1772, died near Santo Domingo, Nov. 2, 1802. He enlisted in the army in 1791, and distinguished himself during the siege of Toulon and in the Italian

campaigns, where he commanded the cavalry at Rivoli as brigadier general. He aided in the establishment of the consulate, for which he was made general of division and received several important commands. In 1801 Napoleon appointed him captain general of Santo Domingo, to enforce the decree for the restoration of slavery, and Leclerc reached Samana early in 1802, with his wife (Napoleon's sister Pauline), and with a large fleet and a force of more than 30,000 men. He combated the negroes with various success till May 1, when a truce was concluded, during which Toussaint l'Ouverture was sent as prisoner to France. The infuriated blacks renewed hostilities under Dessalines, while the French army was decimated by yellow fever, to which Leclerc succumbed. He was succeeded in command by Rochambeau. Pauline accompanied her husband's remains to France. Their only child died in 1804, a year after her second marriage with Prince Borghese.

**LECOMPTON**, a township of Douglas co., Kansas, on the S. bank of the Kansas river, 10 m. N. W. of Lawrence; pop. in 1870, 971. It is the seat of Lane university, under the control of the United Brethren, which was established in 1865, and in 1873 had 2 professors and 81 students. Lecompton was the territorial capital, and was prominent in the disturbances between the friends and opponents of slavery prior to the admission of the state. (See KANSAS.)

**LE CONTE. I. John**, an American naturalist, born near Shrewsbury, N. J., Feb. 22, 1784, died in Philadelphia, Nov. 21, 1860. He entered the corps of United States engineers in 1813, and was early employed in various important surveys and fortifications. He always manifested a taste for the natural sciences, to which he contributed many important papers in the departments of botany and zoölogy. His principal publications are: "Monographs of the North American Species of Utricularia, Gratiola, and Ruellia" (in the "Annals of the New York Lyceum of Natural History," vol. i.); "Observations of the North American Species of Viola" (ibid., vol. ii.); "Descriptions of the Species of North American Tortoises" (ibid., vol. iii.); "A Monography of North American Histeroides" (Boston "Journal of Natural History," vol. v.); and "Descriptions of Three New Species of Arvicola, with Remarks upon other North American Rodents" ("Proceedings of the Academy of Natural Sciences of Philadelphia," vol. vi.).

**II. John Lawrence**, an American naturalist, son of the preceding, born in New York, May 13, 1825. He graduated at the New York college of physicians and surgeons in 1846, and while a student made several scientific journeys to the western states. He has since travelled extensively in North and Central America, for the purpose of scientific investigation, and has contributed many memoirs to the transactions of scientific societies and to journals, mostly

upon the coleoptera of North America. Lists of these memoirs are given by Agassiz, *Bibliographia Zoologica*, and by Hagen, *Bibliotheca Entomologica*, &c. The principal ones are: "Catalogue of Geodaphagous Coleoptera of the United States" ("Annals of the New York Lyceum of Natural History," vol. iv.); "On the Pselaphidæ of the United States" (Boston "Journal of Natural History," vol. vi.); "On the Classification of the Carabidæ of the United States" ("Transactions of the American Philosophical Society," vol. x.); "Attempt to Classify the Longicornia of the United States" ("Journal of the Academy of Natural Sciences of Philadelphia," new series, vols. i. and ii.); and "Synopsis of the Melonthidæ of the United States" (*ibid.*, vol. iii.). The Smithsonian miscellaneous collections include his "Classification of the Coleoptera of North America" (1861-'2) and "List of the Coleoptera of North America" (1863-'6). In 1862 he entered the army as surgeon of volunteers, and was soon promoted to medical inspector in the regular army, in which capacity he served until that grade ceased to exist on the termination of the war. In 1873 he was elected president of the American association for the advancement of science.

**LE CONTE, I. John**, an American physicist, born in Liberty co., Ga., Dec. 4, 1818. He is a descendant of a French Huguenot who near the close of the 17th century emigrated to New Rochelle, N. Y. His grandfather removed to Georgia before the revolution. His father, Louis Le Conte, was a graduate of Columbia college, and became a diligent student of the natural sciences. John graduated at Franklin college, Athens, Ga., in 1838. In 1841 he received the degree of M. D. from the New York college of physicians and surgeons, and in 1842 settled in Savannah. He contributed largely to medical periodical literature, and from 1846 to 1855 was professor of natural philosophy in Franklin college, in 1855 lecturer on chemistry in the New York college of physicians and surgeons, and from 1856 to 1869 professor of natural and mechanical philosophy in South Carolina college, now the university of South Carolina. In 1869 he accepted the chair of physics and industrial mechanics in the university of California, which he still holds (1874). Among his more important papers are those on "Experiments on the Seat of Volition in the Alligator;" "Observations on the Exudation of Ice from the Stems of Vegetables, and the Protrusion of Icy Columns from Earth;" "Observations on the Freezing of Vegetables;" "Researches on the alleged Influence of Solar Light on Combustion;" "On the Influence of Musical Sound on a Gas Flame;" and "On the Discrepancy between the computed and the observed Velocity of Sound in Air and Gases." A treatise on "General Physics," nearly completed by him, was destroyed in the burning of Columbia, S. C., in 1865. **II. Joseph**, an American physicist, brother of the preceding, born in

Liberty co., Ga., Feb. 26, 1823. He graduated at Franklin college, Ga., in 1841, and at the New York college of physicians and surgeons in 1845. In 1848 he settled as a physician in Macon, Ga., and in 1850 went to Cambridge, Mass., to complete a course of studies in natural history and geology under Agassiz, whom he accompanied in 1851 on an exploring expedition to Florida. After graduating at the Lawrence scientific school in Cambridge, he held for one year the chair of natural sciences in Oglethorpe university. He was then for four years professor of natural history and geology in Franklin college, and from 1856 to 1869 of chemistry and geology in South Carolina college. Since 1869 he has been professor of geology and natural history in the university of California. Among the more important of his scientific papers are: "On the Agency of the Gulf Stream in the Formation of the Peninsula and Keys of Florida;" "On the Correlation of Vital Force with Physical and Chemical Forces;" a series of papers "On the Phenomena of Binocular Vision and the Theory of Binocular Relief;" "A Theory of the Formation of the Great Features of the Earth's Surface;" "On some of the Ancient Glaciers of the Sierras;" "On the great Lava Flood of the Northwest;" and "On the Structure and Age of the Cascade Mountains." Among his literary productions are several essays on education and on the nature and uses of fine art. He has also published "The Mutual Relations of Religion and Science."

**LECOQ, Henri**, a French naturalist, born at Avesnes, April 14, 1802, died in Clermont-Ferrand in 1871. He was for many years professor of natural history in the medical school of Clermont-Ferrand, keeper of the mineralogical cabinet, and director of the botanic garden. He wrote numerous works on botany, geology, and agriculture, edited the *Annales de l'Auvergne* (30 vols. 8vo, 1828 *et seq.*), and made considerable donations in money and collections to public institutions. His principal work is *Études de la géographie botanique de l'Europe* (9 vols. 8vo, 1854-'8).

**LECOUVREUR, Adrienne**, a French actress, born at Laméry about 1690, died in Paris, March 20, 1730. She was the daughter of a hatter who established himself in Paris in 1702, and her dramatic genius was evinced by her performances in private theatricals while she was employed as a laundress. In 1717 she made her appearance at the Comédie Française, and was soon recognized as the first French actress of her day, excelling both in tragedy and comedy. Among her lovers, by several of whom she had children, was Maurice of Saxony; and when he needed money to enable him to reconquer Courland, Adrienne raised for him 40,000 francs by selling her plate and jewelry. She died suddenly, and was said to have been poisoned by the duchess de Bouillon, another mistress of Maurice; but the truth of this statement has never been established.



Burial in consecrated ground was refused to her remains, and Voltaire, who was counted among her lovers, wrote a poem, *La mort de Mademoiselle Lecouvreur*, which involved him in trouble, so that he was obliged to leave Paris. Scribe and Legouvé made the career of Adrienne Lecouvreur the theme of a play, which achieved great celebrity from the representation by Rachel of the character of the heroine, which was said to be in many respects similar to her own.

**LE CREUZOT**, a town of France, in the department of Saône-et-Loire, 11 m. S. E. of Autun; pop. in 1866, 23,872. The town and its environs contain the most extensive iron founderies, coal mines, and machine factories in France, which about 1837 were acquired by Messrs. Schneider and co. from an English company. The population was quadrupled between 1846 and 1866, and more than 10,000 persons are employed in the works, which occupy over 500 acres, about 75 of which are covered by workshops. There are about 200 coke ovens and over 20 blast furnaces, besides founderies, locomotive factories, and copper works. The principal products are locomotives, steamboat engines of the largest size, and vast quantities of iron, coal, rails, sheet-iron and iron ware, and instruments of almost all descriptions. A railway of about 6 m. conveys the products to the central canal or canal of Charolais. Great attention is paid to the comfort, medical treatment, and education of the workmen and their families, about 3,000 children attending the industrial school. The works were known at the end of the 18th century, and a large foundry of cannon and cartridges existed here during the revolutionary wars. An extensive manufactory of crystals for chandeliers, rivalling the Bohemian and English establishments, also existed here for a long time, but has been removed to Baccarat. Le Creuzot has attained its present importance through the enterprise of Eugène Schneider, president of the corps législatif under the second empire, and of his elder brother. Strikes of the workmen took place in January and March, 1870, in consequence of a proposition made by the resident manager relative to the benefit fund of the establishment. The former was suppressed only after the arrival of 3,000 troops and the arrest of a few ringleaders. The latter kept Le Creuzot and other centres of industry in a state of excitement for nearly six months.

**LECTOURE**, a town of France, in the department of Gers, on the river Gers, 46 m. N. W. of Toulouse; pop. in 1866, 6,086. It has a college and a hospital. It is the birthplace of Marshal Lannes, to whom a monument has been erected here. In ancient Gaul it was the capital of the tribe of the Lectorates. It became at an early time the seat of a bishopric, which was abolished in 1801.

**LEDA**, in Greek mythology, the daughter of King Thestius or Glaucus. She was wife of

Tyndareus, by whom she was at first mother of Timandra and Philonoe. Her great beauty attracted the love of Jupiter, and she gave birth at the same time to Castor and Clytemnestra, who were of mortal nature, being begotten by Tyndareus, and to Pollux and Helen, who were children of Jupiter and immortal. According to the most common legend, Jupiter surprised her under the form of a swan, and she brought forth two eggs, from one of which issued Helen, and from the other Castor and Pollux. There are still other versions concerning her connection with Jupiter, and there are several of her subsequent history. One account states that she was after death deified as Nemesis, while another declares that Nemesis was the mother and Leda only the nurse or guardian of the eggs. Mythologists have conjectured an identity between Leda and Leto or Latona.

**LEDEBOUR, Karl Friedrich von**, a German traveller, born in Stralsund, July 8, 1785, died in Munich, July 4, 1851. He graduated at Stockholm as doctor of philosophy at an early age, and was appointed in 1805 teacher and director of the botanic garden at Greifswald. In 1811 he became professor of natural history at the university of Dorpat in Russia. In 1826 he explored the Altai mountains, and the result of his investigations is embodied in his *Reise durch das Altaigebirge und die Dsongarische Kirgisiensteppe* (2 vols., Berlin, 1829-'30), and in his *Flora Altaica* (4 vols., Berlin, 1829-'34). In the preparation of the latter work, as well as in that of *Icones Plantarum Novarum Floram Rossicam illustrantes* (5 vols. fol., with 500 colored plates, Riga, 1829-'34), he was assisted by his travelling companions Meyer and Bunge. He regarded his *Flora Rossica* (3 vols., Stuttgart, 1842-'51) as his greatest scientific achievement. He resided successively in Odessa and Heidelberg, and in Munich from 1843 to the time of his death.

**LEDRU-ROLLIN, Alexandre Auguste**, a French politician, born in Paris, Feb. 2, 1808. The son of a wealthy physician, he studied law, and was admitted to the bar in 1830. Soon after, in order to distinguish himself from another member of the bar of the same name, he added to his proper name Ledru that of his natural great-grandfather Rollin. A paper on martial law, which had been proclaimed at Paris by the government in consequence of the republican insurrection of 1832, gave evidence of his ability as a lawyer. Two years later his *Mémoire sur les événements de la rue Transnonain* produced a deep sensation, and thenceforth he was employed as counsel by most of the opposition journals and republican conspirators who were prosecuted under Louis Philippe. In 1837 he assumed the editorship of the *Journal du Palais*, a law periodical, reprinted the volumes previously published (27 vols. 8vo, 1791-1837), and continued it for ten years. He also superintended the publication of *Jurisprudence française, ou Répertoire du Journal du Palais* (8 vols. 4to, 1843-'8), and

added to it a remarkable introduction. In 1844-'6 appeared his *Jurisprudence administrative en matière contentieuse de 1789 à 1831* (9 vols. 8vo). About the same time he was the chief editor of the daily law newspaper, *Le Droit*. In 1838 he bought the place of attorney at the court of cassation, but disposed of it in 1846 in order to devote more time to politics. In 1841 he had been elected deputy by the department of Sarthe, by a nearly unanimous vote, to succeed Étienne Garnier-Pagès, who had just died. He made a bold confession of his republican creed, which caused him to be prosecuted by the government; he was sentenced to four months' imprisonment and a fine of 3,000 francs, but on a new trial was acquitted. He spoke often in the chamber of deputies, but exerted little influence; and not receiving hearty support from the opposition press, he established, under the editorship of Flocon, a journal of his own, *La Réforme*, which advocated not only political but social reforms. In 1845 he issued a socialist manifesto, which secured him a considerable party in the lower ranks of society, while it estranged from him the middle classes. His uncompromising support of the doctrine of universal suffrage displeased also the monarchical opposition party. He took a leading part in all the republican demonstrations in the provinces during the year 1847; and when the revolution of February, 1848, broke out, it was he who chiefly prevented the regency of the duchess of Orleans from being accepted by the chamber of deputies, and secured the powerful help of Lamartine. On the organization of the provisional government, he was elected one of its members. His position was embarrassing; he was associated with men whose principles were entirely discordant, some, like Lamartine and Eugène Garnier-Pagès, entertaining moderate opinions, others, like Louis Blanc and Albert, anxious to bring about a radical change in the social system. Unwilling to go as far as these socialistic revolutionists, he gradually lost his popularity among the lower classes, while he became more than ever distrusted by the *bourgeoisie*. Their distrust was deepened into hatred when, as minister of the interior, he issued revolutionary circulars and sent special commissioners to various parts of France to further the democratic organization of the departments. Nevertheless he evinced great courage in maintaining tranquillity in Paris; his timely precautions defeated the insurrectionary attempt of April 16; he protected the *Presse* and Émile de Girardin against a mob, and reconciled the democrats of Paris to the return of the army to the capital. But his efforts to prevent an open rupture between the opposing parties nearly lost him his seat at the ensuing elections. On the formation of the executive commission by the assembly, he was the last on the list, and received but 458 votes out of about 800. The insurrection of May 15 increased the dis-

trust of all parties toward him. He aided in defeating the object of the insurgents; but when Louis Blanc and Causidière were accused before the assembly, he courageously defended them. When, in consequence of the insurrection of June 24, the executive power devolved on Gen. Cavaignac, Ledru-Rollin resumed his seat in the assembly. His speeches against the state of siege, his explanations of the insurrection of June, and his protest against the sending of a French army to Italy were particularly admired as efforts of oratory. In the presidential election of December, 1848, he presented himself as the democratic candidate, but received only 370,119 votes, while Louis Napoleon Bonaparte obtained more than 5,000,000, and Cavaignac nearly 1,500,000. The standing he held in the assembly, his denunciations of the reactionary tendencies of the majority and the government, and his eloquent appeals in behalf of a truly republican system, somewhat revived his popularity during the first part of 1849. To strengthen this returning favor he assisted at banquets in Le Mans, Châteauroux, and Moulins, where his democratic addresses were hailed with unbounded enthusiasm. A brutal attack upon his person also had the effect of gaining him much sympathy; and in the elections for the legislative assembly he was chosen by five departments at once, Seine, Allier, Var, Saône-et-Loire, and Hérault, while seven others gave him a very heavy vote. This encouraged him to oppose the government still more strongly, and especially to present himself as the defender of the Roman republic, which was on the point of being crushed by the arms of France. On June 11 he moved the impeachment of the president and his cabinet. On the 13th he attempted an insurrectionary demonstration; at the head of a few deputies, some artillerymen of the national guard under Guinard, and a few hundred citizens, he went to the *conservatoire des arts et métiers*; but here, before they had time to take any decisive measures, the insurgents were surrounded by troops. Some of them escaped through an upper window. Ledru-Rollin, after remaining concealed for about three weeks in the neighborhood of Paris, escaped to Belgium, and then went to England, whence he directed a solemn protest against the decree summoning him before the high court of justice. He was sentenced by default to transportation for life. From 1849 to 1870 he resided in London, where he supported himself partly by the remnants of his property and partly by his pen. Besides a pamphlet, *Le 13 juin*, 1849, an apology for his conduct on that day, he published *De la décadence de l'Angleterre* (2 vols. 8vo, Paris, 1850), and *La loi anglaise* (2 vols. 8vo). He was also one of the principal contributors to *La voix d'un proscrit*. He associated himself for a while with Kossuth, Mazzini, Ruge, and other leading revolutionists, in the hope of concentrating the efforts of the European democracy. In 1857 he was accused,

in connection with Mazzini, of a plot against the life of Napoleon III., and was a second time sentenced to transportation. He was also specially excepted from the proclamation of amnesty issued by the emperor in 1860, and again from that issued in 1869. In the latter year the wing of the radical party of which Rochefort was the leader endeavored to enlist him in their cause, but he refused to lend his name to their support. In consequence of this the Ollivier ministry, in January, 1870, revoked the exception made against him in the decrees of amnesty, and he returned to France in March. During the siege of Paris he spoke a few times at radical banquets, and during the insurrection of Oct. 31 he was chosen a member of the committee of public safety, but did not appear at the *hôtel de ville*. At the election of Feb. 8, 1871, he was chosen a member of the national assembly, but resigned on the 19th, on the ground that the election held in such disastrous circumstances did not indicate the free choice of the electors. He remained for some time in retirement, but in March, 1874, was returned to the national assembly from the department of Vaucluse. He is now very rich, having recovered property long withheld from him.

**LEDYARD, John**, an American traveller, born in Groton, Conn., in 1751, died in Cairo, Egypt, Jan. 17, 1789. He lost his father in early childhood, and after an ineffectual attempt to pursue the study of the law, at his mother's request he entered Dartmouth college in 1772, with a view of fitting himself for missionary duty among the Indians. The restraints of this mode of life proving irksome, he absented himself at one time from college for several months, during which he visited the Indians of the Six Nations; and finally, abandoning the idea of becoming a missionary, he embarked on the Connecticut river in a canoe and floated down to Hartford. After a brief experience as a theological student, he shipped at New London as a common sailor in a vessel bound for the Mediterranean, and at Gibraltar enlisted in a British regiment, but was discharged at the request of his captain. Returning to New London at the end of a year, he embarked soon after at New York for England, and arrived in London just as Capt. Cook was about to sail on his third and last voyage around the world. Having procured an introduction to Cook, he was engaged for the expedition and made corporal of marines. Of this voyage he kept a private journal, which in accordance with a general order of the government was taken from him on the return of the expedition to England. Subsequently he wrote out from recollection, assisted by a brief sketch issued under the sanction of the admiralty, an account of the expedition, which was published in Hartford in 1783. During the two years succeeding his return to England he remained in the British naval service, but steadily refused to take arms against his native country.

In December, 1782, being in a British man-of-war off Long Island, he found means to escape, and revisited his friends after an absence of eight years. Having spent many months in fruitless endeavors to fit out an expedition to the N. W. coast, which he was the first of his countrymen to propose, he embarked for Europe in June, 1784, in the hope of finding there the means of carrying his project into effect. He spent a long time in negotiations at Lorient and Paris, at each of which strong hopes were held out to him; but being finally disappointed, he determined to carry out his original design by a journey through northern Europe and Asia, and across Behring strait to the western hemisphere. After further delays and disappointments, he was supplied with a small sum of money by Sir Joseph Banks and others, and departed on his long overland journey in the latter part of 1786. Arriving at Stockholm, he attempted to cross the gulf of Bothnia on the ice to Abo in Finland, but was met by open water in the middle. He immediately altered his course, and in the dead of winter walked around the whole coast of the gulf, arriving in St. Petersburg in the latter part of March without money, shoes, or stockings. This journey of upward of 1,400 m. was accomplished in less than seven weeks. After a delay of several weeks he procured his passport from the empress, and received permission to accompany Dr. Brown, a Scotchman in the Russian service, as far as Barnaul in southern Siberia, a distance of about 3,000 m. Here he parted with his companion, and proceeded to Irkutsk, whence he sailed in a small boat 1,400 m. down the river Lena to Yakutsk. Permission to proceed to Okhotsk being refused, on the ground that the season was too far advanced, it being then the latter part of September, he accompanied a Capt. Billings, in the Russian service, back to Irkutsk, where on Feb. 24, 1788, he was arrested by order of the empress. Accompanied by two guards, he was conducted with all speed to the frontiers of Poland, and there dismissed, with an intimation that he would be hanged if he reëntered Russia. The reason for this summary expulsion of Ledyard from the Russian dominions has never been satisfactorily explained. He found his way back to London in the spring, to use his own words, "disappointed, ragged, and penniless, but with a whole heart," and was cordially received by Sir Joseph Banks and others who had befriended him. Undaunted by previous adversities, he eagerly accepted an offer made to him by the association for promoting the discovery of the inland parts of Africa, to undertake an expedition into the interior of that continent; and when asked how soon he would be ready to set out, replied, "To-morrow morning." He departed from England in the latter part of June, intending to cross the African continent in a westerly direction from Sennaar, and had proceeded as far as Cairo when he was attacked by a bilious disorder

which put an end to his life. His death was considered a great loss to the society under whose auspices he had embarked, and who from the tenor of his first despatches from Egypt, and from his previous labors, had been impressed with his fitness for the part of a geographical pioneer. For capacity of endurance, resolution, and physical vigor, he was one of the most remarkable of modern travellers; and had he possessed means equal to his zeal, his name would doubtless have been associated with important discoveries, as it now is with wonderful and romantic but unprofitable adventures. Many extracts from his journals and his private correspondence with Jefferson and others are given in his "Life" by Jared Sparks ("Library of American Biography," 2d series, vol. xiv.).

**LEDYARD, William**, an American revolutionary soldier, uncle of the preceding, born in Groton, Conn., about 1750, killed at the capture of Fort Griswold, Sept. 7, 1781. He held the commission of colonel in the militia of Connecticut, and during the marauding expedition of Arnold along the coast of that state in September, 1781, he was in command of Forts Trumbull and Griswold, which protected New London. Throwing himself into the latter work with 157 militia hastily collected, he refused a demand for its surrender, and resisted for nearly an hour the attack of a British force numbering 800 men, led by Lieut. Col. Eyre, who received a mortal wound in the onset. His successor, Major Montgomery, having been killed while mounting the parapet, the command devolved upon Major Bromfield, a tory, who effected an entrance into the fort after nearly 200 of his men had been disabled, including 48 killed, the Americans having lost about a dozen killed. To Bromfield's inquiry, "Who commands this garrison?" Ledyard replied, "I did, sir, but you do now," at the same time handing him his sword. Bromfield immediately plunged it through the body of Ledyard to the hilt, killing him upon the spot. A massacre of the Americans ensued, which was not stopped until more than 100 of them were killed and wounded. A monument has been erected near the spot to commemorate this event.

**LEE**, the name of eight counties in the United States. **I.** The S. W. county of Virginia, bordering on Tennessee and Kentucky, and traversed by Powell's river; area, 512 sq. m.; pop. in 1870, 13,268, of whom 1,005 were colored. Powell's mountain lies on its E. boundary, and Cumberland mountain on the N. W. Iron ore, limestone, and saltpetre are found. The soil in the valleys is very fertile. The chief productions in 1870 were 81,620 bushels of wheat, 367,790 of Indian corn, 66,881 of oats, 12,108 of Irish potatoes, 21,864 lbs. of wool, and 132,547 of butter. There were 2,314 horses, 2,581 milch cows, 4,980 other cattle, 11,523 sheep, and 14,564 swine; 4 flour mills, and 6 wool-carding and cloth-dressing establishments.

Capital, Jonesville. **II.** A S. W. county of Georgia, bounded E. by Flint river; area, 600 sq. m.; pop. in 1870, 9,567, of whom 7,643 were colored. It has a nearly level surface, wooded with pine, oak, and hickory, and a fertile soil. The Southwestern Georgia railroad passes through it. The chief productions in 1870 were 155,565 bushels of Indian corn, 13,230 of sweet potatoes, and 10,179 bales of cotton. There were 187 horses, 1,141 mules and asses, 852 milch cows, 2,081 other cattle, 659 sheep, and 2,727 swine. Capital, Starkville. **III.** A S. E. county of Alabama, separated from Georgia by the Chattahoochee river; area, about 550 sq. m.; pop. in 1870, 21,750, of whom 11,597 were colored. The surface is uneven, and the soil fertile. The Western railroad traverses it. The chief productions in 1870 were 35,868 bushels of wheat, 244,955 of Indian corn, 44,005 of oats, 58,827 of sweet potatoes, 112,391 lbs. of butter, and 11,591 bales of cotton. There were 1,265 horses, 1,927 mules and asses, 3,444 milch cows, 6,312 other cattle, 2,019 sheep, and 10,285 swine; 10 flour mills, and 2 saw mills. Capital, Opelika. **IV.** A N. E. county of Mississippi, drained by the Tombigbee river; area, about 600 sq. m.; pop. in 1870, 15,955, of whom 4,855 were colored. The surface is level or undulating, and the soil fertile. The Mobile and Ohio railroad passes through it. The chief productions in 1870 were 443,901 bushels of Indian corn, 76,470 of sweet potatoes, 187,963 lbs. of butter, and 8,224 bales of cotton. There were 3,099 horses, 1,688 mules and asses, 4,025 milch cows, 7,574 other cattle, 6,689 sheep, and 23,442 swine. Capital, Tupelo. **V.** An E. county of Arkansas, formed in 1878 from portions of Crittenden, Monroe, Phillips, and St. Francis counties. It is bounded E. by the Mississippi, and is intersected by the St. Francis and L'Anguille rivers. The surface is generally level, and the soil of extraordinary fertility. Corn and cotton are the principal products. Timber is abundant. Capital, Mariana. **VI.** An E. county of Kentucky, intersected by the Kentucky river; area, about 300 sq. m.; pop. in 1870, 3,055, of whom 131 were colored. The surface is hilly and mountainous, and the soil fertile. It is well wooded, and contains iron and coal. The chief productions in 1870 were 2,239 bushels of wheat, 68,463 of Indian corn, and 7,367 of oats. There were 349 horses, 514 milch cows, 777 other cattle, 1,973 sheep, and 2,646 swine. Capital, Beatyville. **VII.** A N. county of Illinois, drained by Rock and Green rivers and Bureau creek; area, 720 sq. m.; pop. in 1870, 27,171. The surface is chiefly an undulating prairie diversified by tracts of woodland. The soil is very fertile. The Illinois Central and the Chicago and Northwestern railroads cross it. The chief productions in 1870 were 453,053 bushels of wheat, 1,656,978 of Indian corn, 903,197 of oats, 154,665 of barley, 210,873 of potatoes, 26,042 of flax seed, 225,090 lbs. of flax, 44,107 of

wool, 753,149 of butter, 56,840 of cheese, and 57,506 tons of hay. There were 12,159 horses, 12,825 milch cows, 19,295 other cattle, 12,239 sheep, and 25,366 swine; 3 manufactories of agricultural implements, 8 of carriages, 2 of cooperage, 2 of dressed flax, 1 of iron castings, 5 of saddlery and harness, 1 of scales and balances, 1 of woollen goods, and 3 flour mills. Capital, Dixon. **VIII.** The S. E. county of Iowa, bounded N. E. by Skunk river, S. E. by the Mississippi, which separates it from Illinois, and S. W. by the Des Moines, which divides it from Missouri; area, 476 sq. m.; pop. in 1870, 37,210. Coal and limestone are abundant. The surface is diversified by woods and prairies, and the soil is extremely fertile. The Des Moines Valley railroad and the Burlington and Keokuk division of the Chicago and Burlington and Quincy pass through it. The chief productions in 1870 were 260,812 bushels of wheat, 96,553 of rye, 1,187,322 of Indian corn, 272,134 of oats, 132,176 of potatoes, 93,039 lbs. of wool, 451,724 of butter, 110,092 of cheese, and 24,060 tons of hay. There were 8,993 horses, 970 mules and asses, 7,959 milch cows, 12,360 other cattle, 21,446 sheep, and 24,938 swine. There are numerous manufacturing establishments, chiefly in Keokuk and the county seat, Fort Madison.

**LEE**, a town of Berkshire co., Massachusetts, on the Housatonic river and railroad, 110 m. W. of Boston, and 115 m. N. by E. of New York; pop. in 1870, 3,866. The town is handsomely situated, and there are many points of interest in the vicinity. It owes its prosperity chiefly to its extensive paper mills, and it is celebrated for its white marble, which was extensively used in the construction of the capitol at Washington. There are a national bank, 16 public schools, including a high school, a weekly newspaper, and eight churches. The town was settled in 1760.

**LEE**, the name of a family of Virginia, descended from an old cavalier family in England. Richard Lee emigrated to Virginia in the reign of Charles I., bringing with him a numerous household, and settled in the county of Northumberland, between the Rappahannock and Potomac rivers, a region known then and now by the name of the "Northern Neck." This gentleman was a devoted adherent of the Stuarts, and, in conjunction with the royal governor Sir William Berkeley, placed the colony in that attitude of resistance to Cromwell which caused the protector to send a fleet for its reduction under the commonwealth. The party of Lee and Berkeley displayed such determination, however, that the commander of the squadron was compelled to ratify a treaty with the rebellious colony, which was styled an "independent dominion." It is said that Richard Lee soon afterward hired a ship, and visited Charles II. in Flanders, offering to erect his standard in Virginia if assured of adequate support. The plan was not then carried out, but it has been stated that on the death of

Cromwell, Charles II., by the exertions of Lee and Berkeley, was proclaimed in Virginia "king of England, France, Scotland, Ireland, and Virginia," nearly two years before his triumphal entry into London. The king exhibited his gratitude for this espousal of his cause, it is also said, by ordering the arms of Virginia to be quartered on those of Great Britain, with the motto: *En dat Virginia quartam*. Richard, the son of Richard Lee, was a member of the council; and Thomas, third son of the second Richard, succeeded his father, and became president. He died at the moment when his commission of governor of the colony had just been made out. He married Hannah, daughter of Col. Philip Ludwell, an associate in the council; and from this union sprang five sons who rose to distinction, of whom the following are the principal. **I. Richard Henry**, an American statesman, born at Stratford, Westmoreland co., Va., Jan. 20, 1732, died at Chantilly in the same county, June 19, 1794. After a course of private tuition at Stratford, he was sent to Wakefield academy, Yorkshire, England, where he became a proficient in Latin and Greek, and laid the foundation of the extensive knowledge of the classics which afterward added so much to the effect of his oratory. Leaving school at about the age of 18, he made a tour through England, visited London, and returned in his 20th year to Virginia. His father had died two years before, and the young man found himself in possession of a competent estate. He applied himself with ardor to study in the diverse departments of law, politics, theology, science, history, and belles-lettres. At the age of 23, when Braddock came to Virginia, Lee raised a company of volunteers in Westmoreland, was chosen captain, and marched to Alexandria. The general, however, declined his services with an ill-concealed expression of contempt for "provincials," and Lee was compelled to march home again. In his 25th year he was appointed a justice of the peace, a class of officers then constituting the county courts; and notwithstanding his youth, a number of his brother magistrates petitioned the governor and council that Mr. Lee's commission might be antedated in such a manner as to give him legal precedence, and enable him to act as president of the court. He was soon after chosen a member of the house of burgesses from Westmoreland, but did not speak for one or two sessions, when he made a brief and striking but diffident speech strongly opposing the institution of slavery, and advocating the imposition of a tax so heavy as to amount to a prohibition of further importations. In 1764 he took an unhappy step, the effects of which clung to him in a measure throughout life, and dimmed the light of his greatest public services. In a thoughtless moment, and at the instigation of a friend, he wrote to England making application for the post of collector



under the proposed stamp act. That this step was the mere result of hasty and momentary impulse is abundantly proved by the whole tenor of his subsequent career. The small tory party, exasperated by the energy with which he opposed the government, denounced him as a popular demagogue, bent only on revenging his disappointment in procuring the collectorship. The people of his county treated this accusation with contempt; but to satisfy the inhabitants of the colony at large, who did not know him, he published in the "Virginia Gazette" a statement of the facts. He had written to England by the advice of a friend, who no more than himself, "nor perhaps a single person in this country, had at that time reflected the least on the nature and tendency of such an act." Reflection had opened his eyes, and he had soon determined to exert every faculty in opposition to the measure. He joined heart and hand with the opponents of the proposed tax; and when a special committee was appointed by the burgesses to draught an address to the king, a memorial to the lords, and a remonstrance to the commons against taxation without representation, Lee was placed upon the committee, and deputed by his associates to prepare two of the three papers. His literary and political acquirements well fitted him for the task, and the papers proved genuine and eloquent utterances of the spirit of resistance. He was absent from Williamsburg when Patrick Henry introduced, in the ensuing year (1765), his celebrated resolutions against the stamp act; but he warmly concurred in them, and originated an association in Westmoreland in accordance with their spirit. The articles of this association, which were written by Lee, and are still preserved in his own handwriting, go beyond Henry's resolutions, and indicate in a very striking manner the advance of public opinion from May, 1765, to February, 1766. They pledged its members, "at every hazard, and paying no regard to danger or to death, to exert every faculty to prevent the execution of the stamp act." That the association was in earnest is shown by the prompt arrest of a person who had accepted the place of collector. Lee and his friends proceeded to his house, burned his commission and supply of stamps, and compelled him to take an oath not to offend in future. At the winter session of the burgesses in 1766, Lee openly took his stand with the extreme party for reform, at the head of which stood Patrick Henry, by making a motion that the offices of speaker of the burgesses and treasurer of the colony should thenceforth be separate. It is difficult at this distance of time to imagine the profound sensation and the bitter resistance which this proposition aroused. The explanation may however be given in a few words. The death of Speaker Robinson, who also held the post of treasurer, had exposed an enormous deficit in the public accounts. This arose from the fact that Mr. Robinson, a gentleman of great wealth and

the most amiable disposition, had lent to prominent members of the house, who were his friends, large amounts in government bills returned to the treasury, and directed by law to be burned. This had long been suspected, and as early as 1763 Lee had moved that a committee should be appointed to inquire into the state of the treasury. The speaker had "fixed his eyes with a dark and terrible frown" upon the youthful reformer, and the recipients of the loans had "turned their faces from him with haughty and disdainful airs;" but he had persevered. Nothing came of the motion, however, and the subject slept till 1766, when, as has been seen, Lee renewed his motion. It was powerfully opposed by the "aristocratic" party, many of whom had the strongest reasons for desiring its defeat; and by others, like Edmund Pendleton, who had been strongly attached to the deceased speaker. Henry, however, came to Lee's assistance, and their united eloquence carried the motion. Mr. Robinson's ample estate, upon which he had relied to make good the deficit, satisfied the public claim, and the colony lost nothing; but a powerful engine of corruption was broken to pieces by the success of the measure. In 1767 Lee spoke with great ability against the acts levying duties upon tea and other commodities, and for quartering British troops upon the colonies. In 1768 he wrote from Chantilly, where he was then residing, to John Dickinson of Pennsylvania, suggesting a plan of private correspondence between the friends of liberty; and this scheme was enlarged and perfected by the appointment in 1773 of a committee of correspondence, to communicate with all the colonies. Lee was one of the five or six burgesses who in private meeting devised this plan, and is said to have originated the idea. The house promptly appointed the committee, and Lee was placed upon it. The great value of such a body was immediately shown. Acting under instructions from the house, the committee wrote to the sister colonies proposing a general congress. The proposition was almost universally acceded to; and the "first congress" met at Philadelphia, Sept. 5, 1774. Lee was one of the delegates from Virginia, and his voice was the second which was heard upon the floor. Patrick Henry preceded him in a much admired speech, of which the tradition only remains; and little more has been retained of Lee's. It is said, however, that the congress was even more impressed by his comprehensive views and political knowledge than by the "fire and splendor" of his eloquence, of which great accounts had reached them. He immediately took the prominent position to which his great talents and zeal entitled him, and was placed upon all the more important committees: those to prepare addresses to the king, the people of England, and the colonies; to state the rights and grievances of the colonies; and to carry out the resolutions of non-intercourse with Great Britain. Lee was chairman

of the first named committee, and reported its papers. Mr. Jay wrote the address to the people of England; that to the king was probably Lee's; but that Lee wrote the memorial to the people of British America is undisputed. This is one of the most masterly state papers of the period. It has been justly said to have "the double merit of including all the qualities which a public writing ought to possess, and of excluding all that it ought not." It was in speaking of this memorial and the addresses to the king and people of England, that Chatham pronounced his celebrated eulogy upon "the general congress at Philadelphia." Lee's memorial declares in the second paragraph, with solemn earnestness, that "in every case of opposition by the people to their rulers or of one state to another, duty to Almighty God, the Creator of all, requires that a true and impartial judgment be formed of the measures leading to such opposition; . . . that, neither affection on the one hand, nor resentment on the other, being permitted to give a wrong bias to reason, it may be enabled to take a dispassionate view of all circumstances, and to settle the public conduct on the solid foundations of wisdom and justice." The equally solemn conclusion is: "We think ourselves bound in duty to observe to you that the schemes agitated against these colonies have been so conducted, as to render it prudent that you should extend your views to mournful events, and be in all respects prepared for every contingency." In the spring of 1775 Lee was unanimously elected by his neighbors of Westmoreland a delegate to the convention to meet at Richmond in March. He there powerfully supported Patrick Henry's motion for the prompt embodiment of the militia, and was placed upon the committee to prepare a plan of defence. The convention, which had already passed a vote of thanks to himself and his associated delegates, then appointed him to the second congress. He accordingly proceeded to Philadelphia in May, and was placed upon the committees to prepare munitions of war, to encourage the manufacture of saltpetre and arms, and to devise means for the prompt transmission of intelligence between the colonies. As chairman of the committee appointed for the purpose, he drew up the commission and instructions of Gen. Washington as commander-in-chief of the armies of America. Lee's greatest public act at this time, however, was the preparation of the address to the inhabitants of Great Britain, the solemn and lofty tone of which places it in the first rank of American state papers. After a recital of the wrongs inflicted upon the colonies, it proceeds: "And shall the descendants of Britons tamely submit to this? No, sirs! we never will, while we revere the memory of our gallant and virtuous ancestors. . . . Admit that your fleets could destroy our towns, and ravage our sea-coasts; these are inconsiderable objects, things of no moment, to men whose bosoms glow

with the ardor of liberty. . . . Your ministers (equal foes to British and American freedom) have added to their former oppressions an attempt to reduce us by the sword to a base and abject submission. On the sword, therefore, we are compelled to rely for protection. Of this at least we are assured, that our struggle will be glorious, our success certain; since even in death we shall find that freedom which in life you forbid us to enjoy." In May, 1776, the Virginia house of burgesses directed her delegates to propose to declare the colonies independent; and at the request of his associates Lee accordingly moved "that these united colonies are and of right ought to be free and independent states; that they are absolved from all allegiance to the British crown; and that all political connection between them and the state of Great Britain is and ought to be totally dissolved." Lee's speech upon introducing the resolutions is said to have been one of the greatest that he ever delivered. They were seconded by John Adams, and a fiery debate immediately sprang up as to the propriety of the resolutions at that time, which lasted from the 7th to the 10th of June. On that day it was resolved that the subject should be postponed until the first Monday in July, and meanwhile, as the resolutions might be agreed to, that a committee should be appointed to draft a declaration of independence. Of this committee Lee, by established parliamentary usage, would have been the chairman; but on the evening of the 10th he received sudden intelligence of the dangerous illness of his wife, and returned immediately to Virginia. On the next day, the 11th, the committee was appointed, with Jefferson as chairman. In August Lee returned to his seat, and continued in the performance of his arduous public duties until June, 1777. During this time, indeed, he labored so uninterruptedly as seriously to injure his health. From the moment of his entrance into congress to the middle of the year 1777 he had served upon about 100 important committees, generally acting as chairman, and performing the greater portion of the labor of all. On June 5 it was ordered by congress, "that Richard Henry Lee have leave of absence, his health and private affairs requiring his return to Virginia." The private affair was a vindication of his character and public action from charges brought against him in the Virginia assembly, the effect of which had been to induce that body to leave him out in their recent appointment of delegates to the next congress. The indignation of Lee's friends was great. His brother, Francis Lightfoot Lee, and Mann Page, jr., then in congress, taking fire at the condemnation of their associate "in his absence, without opportunity of defence," wrote to the speaker of the house, tendering a resignation of their seats. The people of Westmoreland, ever true to Lee, had already elected him a member of the assembly, and he promptly made his appearance before

that body and demanded an inquiry into his conduct. It was granted; the senate united with the house, witnesses were examined, and Lee was heard in his defence. The charges were, that he had demanded of his tenants payment of their rent in produce instead of money, with a design to depreciate the paper currency of the country; that he had favored New England to the injury of Virginia; and that, as a member of the secret committee in congress, he had opposed the publication of their proceedings from a desire to conceal the embezzlement of the public money. These charges were fully refuted. As to the main imputation, that he designed injury to the currency by receiving produce in place of money for rent, it was shown that the proposition was made to his tenants in 1775, when the non-intercourse associations had ruined the sale of produce, when scarcely any paper money had been issued, and when it was a great favor and convenience to the tenants, for whose relief the plan was devised. Lee's speech upon this occasion is represented to have been full of noble eloquence, and to have affected his listeners profoundly. Without any display of passion or unbecoming anger, he plainly stated that certain evil-disposed persons hated him for that very zeal which good patriots had commended in him; and that these enemies, in his absence, had deliberately planned his destruction. He is said to have shed tears during his speech. The result was a resolution of thanks to Richard Henry Lee "for the faithful services he has rendered his country, in the discharge of his duty as one of the delegates of this state in general congress." When George Mason, one of the recently appointed delegates, soon afterward resigned, Lee was chosen in his place; and thus his vindication was formally recognized as complete. Such is a brief relation of an event which enlisted the deepest feelings of the country at the time, and which still remains a vivid tradition in the popular mind. The motive of the charges it is difficult at the present day to arrive at. Lee's prominent part in the exposure of Speaker Robinson's deficit, and the consequent hatred of the influential members who were involved in it, are said to have laid the foundation of a silent but bitter and profound hostility toward him; and the old application for a collectorship under the stamp act, never allowed to sleep, may have had its influence. Lee returned to congress, and in 1778 served upon 37 committees, though laboring under serious ill health. He continued to sit till 1780. During this and the three succeeding years he remained in Virginia, and as county lieutenant of Westmoreland actively exerted himself in repelling the enemy, who were making incursions on the banks of the Potomac. He also sat in the assembly, and took a prominent part in the debates. In 1784 he resumed his seat in congress, and was elected its president. In 1786 and 1787 he sat in the assembly; was again

elected to congress, and took his seat in the latter year; and when the federal constitution was adopted, was chosen one of the first two senators for Virginia. He was not a member of the Virginia convention to decide upon the adoption of the constitution, and was strongly opposed to that instrument, regarding it as a consolidation of political powers which would tend to destroy the independence of the state governments. Nothing, he said, could have induced him to accept the appointment of senator, except his reverence for the liberties of the land, and "a thorough conviction of the danger these will be exposed to by the unamended state of the new constitution." He exerted himself to carry the proposed amendments, and like his great associates lived to form a more favorable opinion of the instrument. He became a strong supporter of the administration of Washington, and fully approved of his course in the Genet affair, and of his neutrality policy. The last letter which he wrote upon political affairs was a long and earnest one to Washington, warmly approving his measures. In 1792 he finally retired from public service, received a vote of thanks from the Virginia assembly, and returned to Westmoreland.—Lee had married early in life Miss Aylett, by whom he had two sons and two daughters; and after her death, Mrs. Pinkard, who is said to have been "every way worthy of him." He was a devoted member of the Episcopal church, and was twice thanked by conventions of that denomination for the interest which he had taken in its affairs. His charity to the poor was extremely liberal, and no doubt largely contributed to his popularity in Westmoreland. This popularity never failed him, and he never suffered a political defeat in the county. His personal appearance was a valuable assistance to his oratory; it was eminently noble and engaging. His stature was tall, and the carriage of his body graceful and courtly. His countenance was of the Roman model, with a tall, narrow forehead, the head "leaning persuasively forward." By an accident resulting from the bursting of a gun, in shooting swans on the Potomac, he had lost the four fingers of his left hand, and always wore upon it a black silk bandage; but in spite of this misfortune his gesture was so graceful that he was thought to have practised it before a mirror. Lee's disposition was gentle and amiable. He no doubt possessed that pride of race and sentiment of class which then characterized every man of ancient ancestry, and his scholarly habits probably made him appear exclusive and aristocratic in his feelings. There is sufficient proof, however, that he possessed a warm and kindly heart. The well authenticated instances of his open-handed charity, and the warm love which his brothers felt for him, indicate the amiability of his temper; and the many expressions of cordial affection in the letters addressed to him by his contemporaries, show that he had conciliated strong friend-

ships. His "Life and Correspondence" was published by his great-grandson, R. H. Lee (2 vols. 8vo, Philadelphia, 1825). **II. Francis Lightfoot**, one of the signers of the Declaration of Independence, born at Stratford, Westmoreland co., Va., Oct. 14, 1734, died in Richmond in 1797. Owing to the death of his father, he was not, like his brothers, sent abroad to complete his education; but under the direction of the Rev. Mr. Craig, a Scottish clergyman, who acted as private tutor at Stratford, he acquired a competent knowledge of the classics, and a great taste for reading and study. His father had left him an independent estate; and he entered with zest into those social occupations and enjoyments which were then a marked feature in the country life of Virginia. He had engaging manners, and is said to have been a favorite with ladies. From this round of enjoyments he was aroused by the struggle in the house of burgesses against parliament, and in 1765 took his seat there as a member from Loudon county, where his estate was situated. He proved a useful member, but did not distinguish himself as a speaker. He continued to sit till 1772, when, his term having expired, he left the house, was married to Rebecca, daughter of Col. John Tayloe of Richmond, and settled at Monocan in that county. In August, 1775, upon the resignation of Col. Bland, he was chosen by the house of burgesses a delegate to the general congress; and he was successively reelected in 1776, 1777, and 1778. During this whole period he seldom if ever appeared in debate, but acted upon many important committees, and frequently sat as chairman of the committee of the whole. His chief services in congress were the assistance he rendered in framing the old articles of confederation, and the stand which he took in favor of making the right to the northern fisheries and to the navigation of the Mississippi indispensable grounds in the conclusion of the treaty with England. These rights were finally guaranteed, and proved to be of primary importance. The gratitude of the New Englanders to the Lees appears in the correspondence of the period. Aspersions have been cast upon the "Lees of Virginia," the family being represented as hostile to Gen. Washington. The journals of congress sufficiently refute these charges. Richard Henry Lee advocated the scheme of investing Washington with larger powers, and Francis Lightfoot, the only one of the family at that time in congress, voted for a confirmation of the sentence of the court martial against Gen. Charles Lee after the battle of Monmouth, for which reason the latter would never afterward speak to him. He subsequently approved of and supported the federal constitution, on the avowed ground that "Gen. Washington was for it." In the spring of 1779 he retired from congress, and returned to plantation life. He was again called to represent his county in the senate of Virginia, but soon afterward finally abandoned the public

service. His love of ease and fondness for social enjoyment rendered a life in the country more agreeable to him than any other, and he resolutely adhered to his determination not again to engage in politics. His wife had borne him no children, but he was the centre of a large circle of friends. His "gay good humor and pleasing wit" made him a favorite with all, and his plain and easy manners rendered him approachable by persons of every class. He died within a few days of the death of his wife. **III. Arthur**, an American statesman, born in Westmoreland co., Va., Dec. 20, 1740, died in Middlesex co., Dec. 12, 1792. He was the youngest of the five brothers. After a brief course of tuition under a private teacher in Westmoreland, he was sent to Eton in England, where he formed intimate friendships with many youths who afterward became famous in public affairs. His father had designed him for the medical profession, and from Eton he passed to the university of Edinburgh, where he went through the course of general science and polite learning, studied medicine, receiving from the university the degree of M. D. and a diploma approving him a "general scholar," at that time esteemed a great honor. He also gained a gold medal for the best treatise "on some botanical subject," the subject of his paper being the character and uses of Peruvian bark. Leaving the university, he travelled through Germany and Holland, and finally returned to Williamsburg, the capital of Virginia, where he commenced the practice of his profession. He soon acquired reputation, but the threatening aspect of affairs drew him strongly toward political subjects. His brothers were already prominent in politics, and he determined to abandon his profession, return to England, and there embark in the struggle. Accordingly, about 1766 he proceeded to London, where he began the study of the law, which presented far greater allurements to his active mind than the practice of physic. He plunged with ardor into the angry current of newspaper debate. With a young student like himself he formed an intimate connection; this was William (afterward Sir William) Jones, and the correspondence between the friends was long and confidential. He was admitted to the bar in 1770, and began a successful and lucrative practice. He exerted himself in the cause of his native country with extraordinary vigor. His letters, under the signatures of "Junius Americanus" and "Monitor," became widely popular, and procured him the acquaintance and friendship of many of the most distinguished friends of American liberty. His opposition to the act declaratory of the right of parliament to tax the colonies, and to the subsequent stamp act, was warm and persevering; and such was the eloquence of one of his pamphlets, entitled "An Appeal to the English Nation," that it was long regarded as the work of Lord Chatham. As a member of a society of gentlemen of the oppo-

sition who styled themselves "supporters of the bill of rights," he drew up a preamble and resolutions setting forth the principles upon which the club was founded, and these papers were commented upon and praised by "Junius," who declared that Lee was "plainly a man of abilities, though a little unreasonable." In order to vote in municipal elections, he purchased the freedom of the city of London, and exerted himself actively in the opposition. By his influence, the complaints of America were introduced into Wilkes's Middlesex petition; and he obtained the passage of a resolution by the "supporters of the bill of rights" that the members of the club would support no man for parliament who would not give pledges in favor of permitting America to tax herself. About this period Lee was elected a fellow of the royal society, an honor which he resigned at the commencement of the war, on the ground that he could not consent to continue his connection with an English institution requiring pecuniary as well as literary contributions from its members, when England was at war with his native country. Lee's activity in the assertion of American rights soon brought his name prominently before the people of the colonies; and in 1770 he was appointed by the assembly of Massachusetts agent for that colony in case of the absence or death of Dr. Franklin, then holding that position in London. Between Franklin and himself a strong intimacy had sprung up, and the agent and his alternate consulted and acted in unison. The statement of his appointment is made by Lee in his manuscript entitled "Memoirs of the American Revolution," which he commenced in his latter years, but did not live to finish. When Franklin left England in 1774, Lee became sole agent for Massachusetts, and continued as such until he went to Paris. In 1774 he presented the addresses of congress to the people of England and to the king. Lord Dartmouth, to whom the petition to the king was presented, returned that "no answer could be given," whereupon Lee expressed to him his "sorrow that his majesty had adopted a measure which would occasion so much bloodshed." In November, 1775, congress appointed a committee of secret correspondence with the friends of the colonies in England and other countries, and Lee was chosen agent for the purpose in London. He applied himself to the duties of this commission with great activity; and in 1776, by order of the committee, he proceeded to Paris, to open friendly negotiations with the French government. His labors met with fair success. The count de Vergennes presented a memorial to the king, suggesting that it would be sound policy "to facilitate to the colonies the means of procuring, in the way of commerce, the articles and even the money which they needed; but without departing from neutrality, and without giving them direct succors." Through the French ambassador at the English court, Lee finally obtained the assurance that the government would secretly

furnish to the colonies £200,000 worth of arms and ammunition, to be transported from Holland to the West Indies. In September, 1776, congress proceeded to establish diplomatic intercourse with foreign nations; and Lee, Silas Deane, and afterward Dr. Franklin, were appointed commissioners to France. Lee had already accomplished two important objects. He had set on foot a private correspondence with the Spanish government, with the design of prevailing upon that court to unite with France in supplying the United States with money and arms; and had actually procured for the state of Virginia, from the royal arsenal of France, warlike stores of the value of nearly £260,000. The commissioners met in Paris in December, and decided that it was important for one of their number to proceed to Madrid. Lee was chosen, and set out in February, 1777. Soon after his departure, Franklin received from congress the appointment of commissioner to Spain, but declined it, and in May Lee was chosen in his place. As soon as the appointment became known in London, the English government, who were well acquainted with Lee's character, and no doubt divined the objects which he had in view, instructed their minister at Madrid to protest against his reception. Lee was accordingly met at Burgos by a messenger directing him not to proceed further. He returned an animated protest against this order, and the Spanish court finally withdrew it, permitting him to repair to the capital. Here he exerted himself with his accustomed activity, and presented to the government an eloquent memoir on "the present state of the dispute between America and Great Britain," the object of which was to establish the propriety of formally receiving a commissioner from the United States, and opening diplomatic intercourse with that country. He also drew up the plan of a treaty, and placed himself in communication with leading statesmen, persistently urging the adoption of a policy favorable to the cause of America. The government assured him of the good will of the king and the people, but adhered to a course of secrecy and caution. Ambiguous promises were plentifully made; but the only tangible success which Lee achieved was permission to make contracts for arms and ammunition with Spanish merchants. His residence at Madrid was of no slight importance, however, to the American cause. He impressed upon the minds of the statesmen of that country a high idea of the prospects and resources of America, and induced the court to instruct the Spanish minister at Paris to keep up a close and confidential intercourse with the American commissioners; and this intercourse finally enabled him to obtain a large and important loan. He returned to Paris, and found that his associates had during his absence opened negotiations with the Prussian minister. William Lee, brother of Arthur, had just been appointed commissioner to the court of Berlin; but as he already filled the



post of representative of the United States in Holland, where his services were needed, it was resolved that Arthur Lee should, without waiting to hear from congress, take his commission and instructions, and proceed immediately to Berlin. He accordingly left Paris in June, 1777, and repaired to the court of Frederick the Great. The obstacles before him were serious and discouraging. Prussia was not bound in any way to America, and was under treaty obligations with England. The objects of the commissioners were the establishment of commercial intercourse between Prussia and the United States; the prevention of assistance from Prussia to England in procuring German auxiliaries; the prohibition of the passage of such through the dominions of Frederick; and authority to purchase warlike stores from subjects of Prussia. In all these designs Lee fully succeeded. Frederick refused to receive him officially, and thus recognized the independence of the United States; but he was permitted to reside at Berlin as a private person, to carry on a secret correspondence with Baron Schulenberg, the minister of state, and to urge the claims of America as effectually as if he were her formally recognized representative. That his presence in Berlin speedily became known, and was regarded with suspicion and apprehension by the English envoy, is proved by an incident which occurred soon after his arrival. In his absence from the room which he occupied his door was opened by means of a false key, and all his papers were carried off. The servant of the English envoy lived at the same hotel, and Lee immediately addressed a communication to the minister, stating his suspicions, and complaining of the robbery. A note was returned by the king himself, declaring that the police would investigate the matter; and immediately afterward the papers were returned in the same mysterious manner. The affair was traced so clearly to the envoy that, at the king's request, he was recalled by his court. In his note on this occasion, Frederick tells Lee that he may speak without reserve to Schulenberg, and "assures him by the present of an inviolable secrecy, and that profound silence shall be observed with regard to those things that he shall communicate in this manner." When Lee left Berlin he was desired to keep the Prussian court well informed of the progress of the war in America, and assured that Prussia "would not be the last power to acknowledge the independency" of the United States. Thus the American commissioner had met with excellent success. He had accomplished every aim, except the formal recognition of his diplomatic position, and secured results of the first importance to America. On his return to Paris, a new field for his energetic exertions presented itself. Private letters from England informed him that some American prisoners there had been treated with great cruelty, and Lee set about correcting this

wrong with his accustomed vigor. He immediately brought the matter to the knowledge of his colleagues; and it was determined to address a memorial to Lord North, protesting against this harshness. The paper was drafted by Lee, and he also drew up a letter to Lord Shelburne, and despatched both papers to England. A memorial on the subject was also presented to the French court, aiming to secure the interposition of that government, nearly at the same moment when the American congress published its manifesto, proclaiming and justifying its determination to retaliate these cruelties. When the action of congress became known to the commissioners, they promptly announced it to the French and Spanish courts; but the whole subject was ere long overshadowed by the stirring intelligence of the surrender of Burgoyne at Saratoga. Lee despatched the good news to his hundreds of correspondents in Spain, Prussia, and other countries, and applied himself with renewed and ardent vigor to the task of inducing the governments of the continent to espouse the cause of America. The consequences of the triumph at Saratoga soon displayed themselves. The tone of the French court suddenly changed; and negotiations were at once commenced for the formation of a treaty of commerce and alliance. The progress of the negotiation was retarded by a dispute upon some points which Lee objected to. The first project of the treaty did not contain a recognition of the "sovereign" character of the United States; and the importance of this recognition was strongly pressed by Lee upon his colleagues. He also objected to those articles in which it was stipulated that no duties should be charged by the respective governments on any merchandise exported to the French West Indies which yielded molasses, or on the molasses exported thence to the United States. Lee opposed these articles as far too favorable to France, and declared that they gave her the right "to tie both of our hands," with the privilege in return on our part "of tying one of her fingers." It was finally determined that the decision should be left to congress, and the treaty was signed with this understanding by the commissioners. It was received in America "with the liveliest emotions of joy and gratitude;" but when its details came to be coolly considered, the objectionable articles were expunged, in accordance with the views of Lee. The treaty was nevertheless ratified by the French court, and the vexed questions were left open for subsequent negotiation. Soon after the signing of the treaty by the commissioners, Deane, between whom and Lee strong dissensions had occurred, was recalled, and John Adams was appointed in his place. It was through the exertions of Samuel Adams that Lee's early appointment of secret agent for the Massachusetts assembly had been conferred; and between himself and John Adams

commenced a warm friendship never afterward interrupted. This was a matter of some importance to Lee, inasmuch as the relations between him and Franklin were by no means amicable, and indeed soon became openly inimical. During the years 1778 and 1779 Lee continued in active employment, urging upon Spain and Holland the interests of America, and corresponding with the court of Prussia. He also acted as agent for Virginia in negotiating supplies of arms and stores. But a singular reward for his long devotion to the cause of America was about to be bestowed upon him. In the latter part of 1779 it became expedient to appoint a minister plenipotentiary to the court of Spain, and one or more commissioners to negotiate the proposed treaty of peace with England. Lee was nominated, but left out of both appointments. This affront was due to the machinations of his enemies. His colleague Deane on returning to the United States had published an address, in which he spoke of Lee in the grossest terms, and charged him with obstructing the alliance with France and disclosing the secrets of congress to British noblemen. The subordinate agents of America in Europe, employed to conduct the commercial details of public affairs, united also to attack Lee, whose vigilant eyes had detected and exposed their speculations. Through their correspondents in America they disseminated vague calumnies against him, and so persevering were their assaults that they ended by producing a strong effect upon the public mind, and even in shaping the action of congress. When Lee heard of his rejection by that body, he immediately resigned all his appointments, and in August, 1780, sailed for America, to demand an inquiry into his official conduct. He was received at Boston with indications of the highest esteem and respect; and these evidences of public regard were displayed everywhere on his journey to Philadelphia. He had prepared an elaborate report of his entire official proceedings as the agent of the United States, exposing the calumnies circulated against him, and now demanded of congress an opportunity to vindicate himself. His opponents, however, remained silent. It was no part of their plan to make an open accusation against him. The revulsion in Lee's favor seems to have been complete, for congress declared that no charge had ever been entertained against him, and that they had never intended to fix censure upon any portion of his public conduct. As a mark of their confidence, he was requested to lay before them his views, and the information which he possessed, upon foreign affairs. This was done, and Lee added a strict account of all the moneys received or disbursed by him for congress or the state of Virginia; and further published "Extracts from a Letter to Congress, in answer to a Libel by Silas Deane." He then returned to his native state, but was not permitted to remain in retirement. In the spring of 1781 he was elected from the county

of Prince William a delegate to the general assembly. He was a landholder in the county, but did not reside there, and an election under these circumstances has always indicated in Virginia extended public confidence. The assembly appointed him a delegate to congress, and in that body he served from February, 1782, till 1785. Like his brothers, with the single exception of Richard Henry, he was an indifferent speaker, but took a large share in the business of the body. In 1784 he was appointed by congress one of the commissioners to conclude a treaty with the Indians on the N. W. frontier, and prepared a valuable account of the character of the country through which he passed. Lafayette accompanied the expedition, and assisted it by his name and advice. Lee remained with his associates at Fort Stanwix throughout the winter, and treaties were concluded to the satisfaction of congress and the country. On his return he was appointed to the board of treasury with Samuel Osgood and Walter Livingston, in which he continued from 1784 to 1789. In 1786 he was chosen by the general assembly of Virginia one of the commissioners to revise the laws of the commonwealth, and aided greatly in that task. When the board of treasury was dissolved in 1789, he retired finally from public employment, and, purchasing an estate in Middlesex county, applied himself to agricultural pursuits. He continued however to take an interest in politics, and "solemnly investigated" the character of the new federal constitution. He regarded the original instrument with jealousy and dislike, as too strongly tending toward consolidation; but the subsequent amendments greatly changed his opinion of it. During his latter years he carried on an extensive and interesting correspondence with many of the distinguished personages with whom his official career had thrown him in contact. Among these were Burke, Col. Barré, Wyndham, Sir William Jones, the marquis of Lansdowne, and the earl of Buchan; and on the continent, the baron de Breteuil, the abbé Raynal, the duke de la Rochefoucauld, and others. He also corresponded with many persons of literary and political eminence in the United States. This correspondence has been published, and is highly interesting. He was devoted to the improvement of the grounds around his hospitable mansion, and in planting an orchard contracted a pleurisy which proved fatal.—The career of Arthur Lee was one of the most important and useful to his country which the history of that day records. The transient cloud which rested upon his name, from the machinations of those whose speculations of the public money he had exposed, soon passed away without effort upon his part; and when he retired from public affairs, he carried with him the respect and confidence of the best and most celebrated men of his epoch. His face was striking and handsome, his eyes blue and brilliant, and his person pleasing.

His acquirements, exclusive of his medical knowledge, seem to have been extensive. He has been justly styled "the scholar, the writer, the philosopher, and negotiator," and in all these capacities he labored faithfully for the public good. He never married.—His "Life and Correspondence" was published by his grand-nephew, R. H. Lee (3 vols. 8vo, Boston, 1829).

**LEE, Alfred**, an American clergyman, bishop of the Protestant Episcopal church in Delaware, born in Cambridge, Mass., Sept. 9, 1807. He graduated at Harvard college in 1827, studied law, and practised for a time, but subsequently studied for the ministry in the general theological seminary in New York. He became rector of the Episcopal church at Rockdale, Del., in 1838. He was consecrated bishop of Delaware in October, 1841, and became rector of St. Andrew's church, Wilmington, where he still resides. He is the author of a "Life of the Apostle Peter, in a Series of Practical Discourses" (12mo, New York, 1852; London, 1853); "Life of St. John" (1854); "Treatise on Baptism" (1854); "Memoir of Miss Susan Allibone" (1856); and "Harbinger of Christ" (1857). He has received the honorary degree of S. T. D. from Trinity college, Hartford.

**LEE, Ann**, the founder of the sect of Shakers in America, born in Manchester, England, Feb. 29, 1736, died in Watervliet, N. Y., Sept. 8, 1784. Her parents were members of a distinct branch of the society of Friends, and too poor to afford their children even the rudiments of education. She was early married to Abraham Stanley, by whom she had four children who died in infancy. She became in 1758 a member of the Manchester society of Friends, and in 1770 she professed to have received a divine mission to deliver her "testimony against all lustful gratifications as the source and foundation of human corruption and misery." Her peculiarity of manner and the novelty of the doctrines she preached subjected her at first to abuse, and she was at length confined in prison by the authorities of Manchester for several weeks. During this imprisonment, Christ, she said, revealed to her in a vision the most astonishing views and divine manifestations of truth; and after her release she was regarded by her sect as "a mother in spiritual things," and was always called by them "Mother Ann." In 1774 Ann Lee, with others of her sect, including her husband and a brother and niece, emigrated to New York, for the purpose of establishing there the "church of Christ's second appearing." The company separated for a time in order to seek employment and the means of subsistence; but about 1776 they were reunited in the present town of Watervliet, near Albany, where Ann Lee, who had previously formally dissolved her connection with her husband, became their recognized head. In 1780, during a religious revival in New Lebanon and several adjoining towns, the company first brought itself into notice, and under the influence of Ann Lee many persons were

converted to their doctrines. In this movement originated the flourishing society at New Lebanon. They incurred, however, the suspicion of the local authorities with regard to their friendliness to the patriotic cause, and Ann and others were imprisoned for several months for refusing to take the oath of allegiance to the state of New York, it being contrary to their faith. They were released without a trial by order of Gov. George Clinton in the latter part of 1780. In 1781-'8 Ann Lee and the elders of the society at Watervliet made a missionary journey through New England, in the course of which societies were founded in Harvard, Mass., and other places. She died about a year after her return.—See "Ann Lee, or Shakers and Shakerism," by F. W. Evans.

**LEE, Charles**, a major general in the American revolutionary army, born at Dernhall, Cheshire, England, in 1731, died in Philadelphia, Oct. 2, 1782. He was the youngest son of John Lee, colonel of the 44th regiment in the British service, and is said to have held a commission in the army when 11 years of age. He received a tolerable education, and early prepared himself for his profession by studying the science of war. At 20 years of age he became a lieutenant in the 44th regiment, and in 1754 accompanied the troops sent to America, where during the next six years he saw considerable service. The 44th was one of the two European regiments which followed Braddock in his expedition to Fort Duquesne, and at the disastrous battle on the Monongahela Lee received his first practical experience of warfare. He found his way in safety to Philadelphia with the remnant of the British army, participated in the various indecisive movements of the campaigns of 1756 and 1757 as captain of a company of grenadiers, and in 1758 was present in the assault on Ticonderoga, where he was severely wounded by a musket shot. He subsequently traversed a large portion of the western frontier, and after the reduction of Fort Niagara and Montreal in 1760 returned to England, where he was promoted to a majority in the 103d regiment of foot. This regiment was disbanded in 1763, and Lee continued a major on half pay till 1772, when he was made a lieutenant colonel on half pay, which was the highest rank he ever attained in the British service. In 1762 he accompanied the British army sent to Portugal to protect the frontiers of that country from the incursions of the Spaniards, and while in the brigade of Gen. Burgoyne distinguished himself by a brilliant night attack upon a Spanish post near the old Moorish castle of Villa Velha, which the commander-in-chief, Count Lippe, described as "a very gallant action." But notwithstanding this testimonial to his bravery, and others equally complimentary from the king of Portugal and influential friends, his promotion lagged. Various reasons have been assigned for this, the most probable being

the freedom with which he discussed ministerial plans respecting America, and in general his severe strictures upon persons in authority. He was by nature impulsive, restless, opinionated, and overbearing, and his unhappy temper interfered on many occasions with the advancement to which his talents in reality entitled him. The Mohawks, into whose tribe he was adopted during his residence in America, aptly named him Ounewaterika, "Boiling Water." Wearied with the inactive life of a half-pay officer, he visited the continent with recommendations from his former commander, was well received by Frederick the Great, and at Warsaw was appointed by King Stanislas Augustus one of his aides-de-camp, an office of honor, however, rather than employment. In the latter part of 1766 he returned to England, bearing a letter of recommendation from Stanislas Augustus to George III., and made urgent attempts to obtain promotion, or at least a military command. His meddling disposition again interfered with his advancement; and in consequence of some sarcasms directed against the military character of Gen. Townshend and Lord George Sackville, he found the door of promotion shut against him. The disappointment attending the ill success of this attempt rankled in his breast and affected his whole subsequent career. Returning to Poland in 1769, he was made a major general in the Polish service, subsequently served for a short time in the Russian army in a campaign against the Turks on the Pruth, and for a year or two pursued a restless, wandering life through southern Europe. In Italy he fought a duel with a foreign officer, in which the latter was killed; and in the course of his life he became involved in many similar affairs, from which his courage and address generally enabled him to escape unharmed. In 1773 he was again in England with a temper soured by ten years' unavailing struggle for preferment, venting his spleen against the ministry in squibs and newspaper articles full of irony and sarcasm, and systematically opposing every project emanating from government. He had some reputation as a political writer, and, according to Thomas Rodney of Delaware, confessed to that gentleman in 1773 that he was the author of the letters of Junius. Upon this statement and other circumstances an attempt was subsequently made by Dr. Thomas Girdlestone to prove that Lee and Junius were identical. It has been supposed by some that his vanity induced him to claim the letters as his own. The threatening aspect of affairs in America meanwhile suggested to him a sphere of action in which his hatred of ministerial oppression might find a wider sympathy than at home; and in the summer of 1773 he left England for ever, arriving in New York in October. His reputation as a caustic writer on the liberal side in politics, and to a certain degree as a general of European experience and renown, caused his arrival in the country to be hailed

as an acquisition to the patriotic cause. During 1773-'4 he travelled extensively through the colonies, cultivating the acquaintance of prominent whigs, vigorously upholding with pen and tongue the claims of the people, and expressing both in his correspondence and conversation great enthusiasm for freedom. Writing to Gates, an old fellow campaigner in America, under date of May 6, 1774, he says: "For my own part, I am determined (at least I think I am) not to be slack in whatever mode my service is required." In the same year he wrote his "Strictures on a Pamphlet entitled 'A Friendly Address to all Reasonable Americans,'" in reply to Dr. Myles Cooper, a tory clergyman of New York; this was one of the ablest of his literary performances, and was widely circulated, and read with avidity by all classes. The freedom with which he avowed his sentiments did not fail to arouse the suspicions of the British ministry; and his presence in Boston during the summer of 1774, where he associated with the leading patriots, induced Lord Dartmouth to warn Gen. Gage to "have an attention to his conduct, and to take every legal method to prevent his effecting any of those dangerous purposes he is said to have in view." He was present at Philadelphia during the session of the first continental congress, animating its members by his own zeal; and about the same time, as if to identify himself completely with the colonists in their impending struggle with the mother country, he purchased an estate of 2,400 acres in Berkeley co., Va., in the neighborhood of his friend Gates. Congress having determined after the combats at Lexington and Concord to organize a continental army, Lee was, on June 17, 1775, appointed the second major general, ranking after Gen. Artemas Ward, then first in command of the New England troops encamped around Boston. Though disappointed in not receiving a higher command, to which in the opinion of many his efforts in behalf of the colonies as well as his military talents and experience entitled him, he accepted the appointment, first, however, in a letter to the British secretary at war, resigning his commission in his majesty's service, and declaring his readiness to serve the king whenever called upon "to act against the enemies of his country or in defence of his just rights and dignity." Although he was accustomed to refer to this act of his life as one which involved the confiscation of his property in England, it is proper to remark that after a conference with a committee appointed at his own request, in which he unfolded his pecuniary circumstances, congress undertook to indemnify him for any loss he might sustain by entering into their service, and subsequently advanced him \$30,000 for that purpose. Early in July, in company with Washington, he arrived at the camp at Cambridge, and formally entered the service, "a soldier of fortune," says Irving, "indifferent to the ties of home and country, drawing his

sword without enthusiasm, more through resentment against a government which had disappointed him, than zeal for liberty or for colonial rights." During the summer and autumn he held command of the left wing of the American army posted on Winter hill, sustaining his reputation as a military authority, although his manners were far from agreeable, and the opinion began to gain strength that personal ambition was his main incentive in embarking in the cause of the colonies. In November, 1775, he visited Newport, R. I., for the purpose of erecting works of defence, gratifying his hatred of Tories while there by making them take a "tremendous oath" to support the authority of congress; and in February, 1776, he was sent on a similar mission to New York, whence in March he departed for Virginia to take command of the southern department. After organizing the military defence of that colony, he marched in the latter part of May toward Charleston to meet the forces which it was apprehended were to be landed from the British fleet under Sir Peter Parker. He arrived in the city June 4, and at once reported it "utterly defenceless." The fort then building on Sullivan's island he particularly objected to, predicting that it could not hold out half an hour, and calling it a "slaughter pen;" and he endeavored, though unsuccessfully, to persuade Gov. Rutledge to abandon it. During the memorable defence of the work by Col. Moultrie, June 28, he took no measures to support the garrison, and, instead of supplying them with ammunition when their stock was exhausted, counselled them to spike their guns and retreat. Nevertheless, much of the credit of the successful defence of Charleston was ascribed to him, and he returned to the north in the autumn with an enhanced military reputation, and an exaggerated notion of his own importance to the American cause. He was now, by the resignation of Gen. Ward, first major general, occupying the second rank in the army; and many persons, contrasting his presumed successes in the south with the recent defeat on Long Island, began to consider him the main hope of the American arms. On Oct. 14 he joined the camp on Harlem heights, and with his customary good fortune received the credit of advising the evacuation of New York island and the retrograde movement by which the plans of Howe for surrounding the American army were defeated, although the chief features of the plan had been determined upon a month previous. His division covered the retreat of the American army over King's bridge; and after the passage of Washington into New Jersey, he was left in Westchester county, in the neighborhood of New York, in command of a force of 7,000 men. The possession of a separate command flattered his vanity, and, impressed with the idea of attacking New York, or assailing the rear of the enemy, or performing some other exploit equally brilliant, he

lingered week after week in Westchester, notwithstanding urgent appeals from Washington to join him in New Jersey; and after crossing the Hudson at Haverstraw, Dec. 2-4, he pursued his march southward with equal dilatoriness. Being "in hopes to reconquer the Jerseys," he moved in a road about 20 m. west of the British army, and, disregarding the directions of Washington, awaited the opportunity which he expected would soon present itself to make an independent demonstration on the enemy's flank. On the morning of Dec. 13, while quartered with his aides and a small guard at White's tavern, Baskingridge, about three miles from his army, which was left under the command of Gen. Sullivan, he was surprised and captured by a party of British light horse under Col. Harcourt, who had received intelligence of his movements from a Tory of the neighborhood. After a brief resistance Lee surrendered himself, according to the British accounts, in the most cowardly manner, and was hastily mounted behind one of the troopers, and carried away at full speed to the British camp at New Brunswick, whence about three hours afterward the booming of cannon proclaimed the exultation of the enemy at the capture of the "American Palladium," as Lee was styled by them. Notwithstanding the unfavorable suspicions which the circumstances attending his capture have provoked, there seems no reason to believe that he was then acting a treacherous part, or that he was guilty of any graver offence than negligence or disobedience of orders. The Americans sincerely deplored his loss, and upon learning that he was regarded by his captors as amenable to British military law as a deserter, congress at once adopted retaliatory measures, and ordered five Hessian field officers and Lieut. Col. Campbell to be taken into close custody, to await the fate of Lee. In consequence of the firm stand taken by congress, Gen. Howe advised the British ministry to countermand their first instructions that Lee should be sent to England for trial, and to allow him to be considered a prisoner of war. A reluctant consent having been obtained, he was, in December, 1777, put upon parole, and treated with the consideration usually bestowed upon prisoners of rank. During the period that his fate was involved in uncertainty, his interest in the colonial cause seems to have yielded to solicitude for his personal safety; and the evidence is now strong that for the purpose of securing this end he was willing to betray his adopted country. From a recently discovered document in Lee's handwriting, indorsed by Henry Strachey, secretary to the royal commissioners, Lord and Sir William Howe, as "Mr. Lee's Plan," it appears that on March 29, 1777, he submitted to the British commander a project for the reconquest of America, the chief feature of which was the concentration of forces at Annapolis and Alexandria for the purpose of cutting off com-



munication between the northern and southern states; the result of which would be, that while the advance of Burgoyne from the north would give sufficient occupation to New England and New York, Howe could overwhelm the American army in New Jersey, thus "unhinging and dissolving the whole system of defence." Upon this document, the authenticity of which is deemed incontrovertible, an elaborate paper, entitled "The Treason of Charles Lee," was read before the New York historical society by George H. Moore in June, 1858, and afterward separately published. The mysterious expedition of the Howes with the British fleet southward in the summer of 1777, it is supposed, may be explained by a reference to this plan; and Lee's request to congress, during his captivity, to be permitted to communicate to a committee of their body matters of interest to the public and to himself, may be in like manner referred to his desire to be of service to the crown in reopening negotiations with congress. In May, 1778, he was exchanged for Gen. Prescott, and joined the American camp at Valley Forge, where he received the command of a division. In the general council of officers held in the succeeding month he strongly opposed the project of attacking the British army on their march from Philadelphia through New Jersey; and he subsequently commanded the advance at the battle of Monmouth, June 28, after formally resigning the post to Lafayette. His wilful conduct on this occasion in ordering a retreat by which the day was nearly lost, against the express command of Washington, who was hurrying forward to his support with the main body of the American army, was the occasion of an outbreak of anger on the part of the commander-in-chief which was long remembered by those who witnessed it. Some, who had noted Lee's opposition to any project for attacking the enemy, were led to suspect that he was secretly aiding them by endeavoring to procure a defeat of the Americans. It appeared afterward that his division, consisting largely of militia, had been unexpectedly attacked by the whole rear guard of the British army, and that some little confusion at first prevailed in the American ranks; but after putting the most favorable construction upon his conduct, it is impossible to absolve him from the charge of irresolution and negligence unworthy of a commanding officer. Such was substantially the verdict of the court martial convened to examine into his conduct at Monmouth, who also found him guilty of writing disrespectful letters to the commander-in-chief, and sentenced him to suspension from any command in the army for one year. He was not prepared for this sentence, having expected from the ingenuity and ability of his defence to be triumphantly acquitted; and during the delay of congress to affirm it, his naturally irascible temper betrayed him into frequent acts of imprudence, which only increased the

feeling of suspicion and dislike with which he was beginning to be regarded. For the disparaging manner in which he spoke of Washington he was challenged by Col. John Laurens, one of the latter's aides, and was wounded in the side by a pistol ball in the duel which ensued. Congress having ratified his sentence, he retired to his estate in Virginia, where he wrote for the "Maryland Journal" his "Queries, Political and Military," the drift of which was to cast a slur upon the character and military conduct of Washington. He inhabited a house rudely and hastily constructed, without partitions, and almost without the necessary furniture, where, surrounded by his dogs, of which he was immoderately fond, and his books, he lived "more like a hermit than a citizen of the world." The divisions of the apartments were marked by lines of chalk, which he claimed was an improvement upon walls. The term of his suspension had just expired when a rumor reached him that congress designed to deprive him of his commission. In a sudden fit of anger he despatched to the president of that body an insulting note, the result of which was his immediate dismissal from the service. He soon wearied of the life of a planter, and in the autumn of 1782 visited Baltimore and Philadelphia with a view of negotiating for the sale of his estate. In the latter place he was attacked by a fever of which he died within five days, exclaiming in the delirium of his last moments: "Stand by me, my brave grenadiers." With characteristic eccentricity he directed in his will that his body should not be interred in any church or church yard, or within a mile of any Presbyterian or Anabaptist church. He was, however, buried in the cemetery of Christ church, whither his remains were attended by a large concourse, including many whom his wayward conduct had not entirely alienated, and who gratefully remembered his early efforts for colonial freedom, and his occasional generous acts and impulses. His memoirs have been written by Edward Langworthy, by his kinsman Sir Henry Bunbury, and by Jared Sparks in his "Library of American Biography."

**LEE, Charles Alfred**, an American physician, born at Salisbury, Conn., March 3, 1801, died at Peekskill, N. Y., Feb. 14, 1872. He graduated in medicine at the Berkshire medical institution in Pittsfield, Mass., in 1825, and became widely known as a teacher and writer upon medical subjects. He held professorships at various times, chiefly of materia medica and obstetrics, in the medical department of the university of the city of New York, the Geneva medical college, at Geneva, N. Y., the medical department of the university of Buffalo, the Berkshire medical institution, the Maine medical college at Brunswick, the Vermont medical college at Woodstock, and the Columbus medical college, Ohio. He conducted for some years the "New York Journal of Medicine," and edited the American edition of

Copland's "Dictionary of Practical Medicine" (New York, 1844-'58), besides making many communications on various subjects to the medical periodicals. His last work, published shortly before his death, was "Remarks on Wines and Alcohol" ("Journal of Materia Medica," September and October, 1871).

**LEE, Eliza Buckminster**, an American authoress, born in Portsmouth, N. H., about 1790, died in Brookline, Mass., June 22, 1864. She was a daughter of the Rev. Dr. Joseph Buckminster, from whom as well as from her brother, the Rev. Joseph Stevens Buckminster, she acquired a classical education and a fondness for literary pursuits. She was married to Mr. Thomas Lee of Boston, in which city and its vicinity the greater part of her life was passed. Her career as an authoress commenced with the publication of "Sketches of a New England Village" (1837), followed by "Delusion." In 1842 appeared her "Life of Jean Paul Richter" (New York), translated from the German, and in 1845 she published "Walt and Vult, or the Twins," from Richter's *Fliegeljahre*. Her remaining works are: "Naomi, or Boston Two Hundred Years Ago" (Boston, 1848); "Memoir of Rev. Dr. Buckminster and Joseph Stevens Buckminster" (1849); "Florence, the Parish Orphan" (1850); "Parthenia, or the Last Days of Paganism" (1858); and "The Barefooted Maiden," a translation from Auerbach.

**LEE, Ezra**, an American revolutionary soldier, born in Connecticut in 1749, died in Lyme, Conn., in 1821. In August, 1776, he volunteered on the hazardous enterprise of affixing Bushnell's infernal machine to the British ship Eagle, then lying in New York harbor; but the attempt, owing to the thickness of her copper sheathing, was only partially successful. He landed safely after remaining several hours in the water, and received the congratulations of Washington. He served with credit at Monmouth and in other battles of the revolution.

**LEE, Hannah F. (SAWYER)**, an American authoress, born in Newburyport, Mass., in 1780, died in Boston, Dec. 28, 1865. She was the daughter of a physician of eminence in her native place, and for many years resided in Boston. Her first known publication was the appendix to Miss Hannah Adams's memoir of herself, which was succeeded by "Grace Seymour," a novel, and "Three Experiments of Living," published in 1838. The subject of the latter work was suggested by the commercial disasters of the time; it has passed through upward of 30 editions in the United States, besides many in Europe, and is esteemed her best work. Her remaining works are: "The Old Painters;" "Eleanor Fulton," a sequel to "Three Experiments of Living;" "Rich Enough;" "Luther and his Times;" "Cramer and his Times;" "The Huguenots in France and America;" "The World before You;" "Stories from Life" (1849); "Memoir

of Pierre Toussaint" (1853); and "History of Sculpture and Sculptors" (1854).

**LEE, Henry**, an American soldier, born in Westmoreland co., Va., Jan. 29, 1756, died at Cumberland island, Ga., March 25, 1818. His father was Henry Lee, first cousin of Richard Henry, Francis Lightfoot, and Arthur Lee; his mother was Mary Bland, daughter of Col. Bland of Jordans, in Prince George co., Va. He received his early education from a private tutor, and was afterward sent to Princeton college, then presided over by Dr. Witherspoon. While at college Dr. Shippen predicted his future distinction. He graduated in 1774, in his 18th year, and returning home took charge of all the private affairs of his father, who was then engaged in negotiating a treaty with some Indian tribes on behalf of the colony. This charge he executed with great prudence, industry, and ability for one so young. In 1776, when 20 years of age, he was appointed, on the nomination of Patrick Henry, captain of a company of cavalry in Col. Theodore Bland's "Virginia regiment," and in September, 1777, marched with his regiment to join the main army. He soon distinguished himself by the excellent discipline which he introduced into his company, the care which he took of his men and horses, and by skirmishing, foraging, and procuring information of the movements of the enemy. He was enabled by his strict discipline to move with celerity and effect, and seems at once to have adopted that rapid and daring system of tactics which made "Lee's legion" afterward so efficient in the south. It is certain that his vigilance and zeal secured for him the respect and confidence of Washington, who selected Capt. Lee's company for his body guard at the battle of Germantown. The enemy seem also to have formed a high opinion of his abilities, and of the importance of taking him prisoner. In January, 1778, it was discovered that Capt. Lee, with only ten men, was at a stone house not far from the British lines. A design was immediately formed to capture him; and 200 troopers were detached to make a circuit and fall upon him by surprise. The troopers approached without his knowledge, seized four of his patrols who were prowling in search of forage, and attacked him before he was aware of their vicinity. He made a desperate defence, and the enemy were forced to retire with a loss of four killed, and one officer and three privates wounded. Of his own men, besides the patrols and the quartermaster sergeant, who were made prisoners, he had but two wounded. Washington wrote him a letter complimenting him upon his gallantry on this occasion, and he was soon afterward raised to the rank of major, with the command of an independent partisan corps of two companies of cavalry, subsequently enlarged to three, and a body of infantry. He continued in active service, and on July 19, 1779, at the head of a body of 300 men, surprised the British garrison

at Paulus Hook, took 160 prisoners, and effected his retreat with the loss of only two men killed and three wounded. For the "prudence, address, and bravery" which he displayed in this affair, congress voted him a gold medal. In January, 1781, he marched his legion to the south, and joined the army of Greene, with the rank of lieutenant colonel. In the great retreat of Greene before Lord Cornwallis, Lee's legion formed the rear guard of the American army, the post of greatest danger. The pursuit was hot, and at one time the rear guard came in contact with the troopers of Tarleton. Lee charged Tarleton, killed 18 of his men, and took one captain and several privates prisoners. When Greene had effected his retreat, he despatched Lee and Col. Pickens into North Carolina, to watch and harass the movements of Cornwallis. On their march they fell in with a couple of messengers from Col. Pyle, commander of a body of 400 Tories, to Cornwallis. The messengers, supposing from the accoutrements of the troopers that Lee was Tarleton, communicated to him the substance of their instructions, which embraced full information of Pyle's intended movements. Lee did not undeceive them, personated Tarleton throughout, and despatched one of the messengers back to Pyle, directing him to post himself with his force at a place which he indicated. The Tories accordingly took their position, and the troopers came up with them, and charged and defeated them, killing 90, and taking others prisoners. At the battle of Guilford Court House Lee performed very important services, and greatly distinguished himself. On the morning of the day of battle he encountered Tarleton's celebrated troop of cavalry, and drove them back with considerable loss. In the main engagement he was stationed with his legion on the left wing of Greene's army; and although the body of militia which composed the principal force attached to his position abandoned him at the very commencement of the action, Lee obstinately held his ground, and kept the enemy at bay until he received the order to fall back upon the main body, whose retreat he covered. It was by the advice of Lee that Greene came to his celebrated and daring decision not to follow Cornwallis into Virginia, but to leave that province to its fate, and march southward, with the view of ending the conflict in South Carolina and Georgia. The praise or blame attached to this extreme step must therefore be shared between the two commanders. The result is known, and fully vindicated the expediency of the movement, cruel as it appeared to Virginia in her prostrate condition. In pursuance of his plan of operations, Greene detached Lee with his legion to join the body of partisans under Marion, and fall upon the lesser posts of the enemy. By a series of vigorous operations, Forts Watson, Motte, and Granby were speedily compelled to surrender; and Lee was then ordered to join Pickens, and

assist in the attack upon Augusta. On his way he surprised and took Fort Galphin. The defences of Augusta consisted of Fort Cornwallis and Fort Grierson. The latter was taken by assault, and the former at the end of a siege of 16 days. Col. Brown, its commander, was particularly obnoxious to the Americans, and his life was only preserved by the interposition of Lee. That officer marched with his prisoners to rejoin the army of Greene, which had sat down before Fort Ninety-Six. Lee was intrusted with an important position when the attempt was made to take the place by storm. He led the assault with his habitual daring, and was completely successful; but the other division failed in its object, and the advance of Lord Rawdon compelled Greene to abandon the siege. His gallantry at the battle of Eutaw Springs contributed largely to the result of that action. His legion covered the right flank, and when the militia gave ground before the enemy, he obstinately maintained his position unsupported. His order to Capt. Rudolph, of the infantry corps attached to his legion, to turn the enemy's flank, and give them a raking fire, resulted in the retreat of the left wing of the British forces, which were completely broken, and driven from the field. The charge upon the enemy's right was not so fortunate, and the Americans were compelled to retire. It is more than probable that Lee's impetuous charge alone saved the army from defeat. The revolutionary struggle was now drawing to a close. Greene had rightly supposed that the main army under Washington was more than a match for the force of Cornwallis. In October, soon after the battle of Eutaw, Lee was sent on a special mission to Washington, with the request from Greene that he would prevail on the count de Grasse to afford naval assistance in the proposed siege of Charleston; and he arrived at Yorktown about the period of the surrender of Cornwallis. Lee's relations with Greene have been misrepresented by the partisan adherents of that great and excellent man. Lee fancied that he had been injured by the neglect of Greene to speak of him in his general reports as his services deserved; and a correspondence ensued upon the subject in 1782. The general declared that Lee's wish to retire originated, he believed, in "distress" rather than the injuries which his health had undergone, and combated his resolution in a tone of affectionate remonstrance. He had been under obligations to Lee, he said, which he could "never cancel." As to his military services, Greene wrote: "I believe that few officers, either in Europe or America, are held in so high a point of estimation as you are. . . . Everybody knows I have the highest opinion of you as an officer, and you know I love you as a friend. No man in the progress of the campaign had equal merit with yourself." The friendly relations afterward subsisting between these two eminent men, and the manner in which Lee speaks

of Greene in his memoirs of the southern campaign, show that this temporary misunderstanding did not continue. Finding his services no longer necessary, however, Lee retired from the army, and returned to Virginia. He settled down at Stratford, the old family mansion in Westmoreland, and was soon afterward married to his cousin Matilda, daughter of Philip Ludwell Lee. Upon the death of this lady, he married Ann, daughter of Charles Carter. In 1786 he was appointed by the Virginia assembly one of the delegates to congress, in which body he remained until the federal constitution went into operation. In 1788 he was a member of the Virginia convention to decide upon the adoption of the proposed instrument, and took a prominent position among the advocates of the measure. He subsequently served in the Virginia house of delegates, and in 1792 was elected governor of the commonwealth for the term of three years. In 1794 occurred the whiskey insurrection in Pennsylvania. Every peaceable attempt to suppress the outbreak having failed, the president ordered a military force to be raised, which he placed under the command of Lee. The advance of the well known partisan of the revolution at the head of 15,000 men speedily terminated all resistance, and Lee soon returned to Virginia. In 1799 he again served in congress; and when intelligence was received of the death of Washington he was appointed by the house to pronounce a eulogium. The resolutions which he drew up on this occasion, and which were presented during his temporary absence by his friend Judge Marshall, contained the words now so celebrated: "First in war, first in peace, and first in the hearts of his countrymen." On the election of Jefferson to the presidency in 1801, Lee retired from public affairs, and established himself as a country gentleman in Virginia. The remainder of his life was not, however, to be tranquil. The profuse hospitality and free mode of living then the fashion plunged him into pecuniary trouble, and terminated in the ruin of his estate. He was even arrested for debt, and, if the statement of some persons is to be credited, lodged in the jail of Spottsylvania. The more probable account is, that he was confined within "the limits" of that county only. Here, in the year 1809, he wrote his "Memoirs of the War in the Southern Department of the United States," which deservedly ranks among the most valuable and interesting works of a similar description. It seems to have been largely based upon communications from his brother officers, is written with candor and impartiality, and possesses the charm peculiar to writers who have witnessed with their own eyes the scenes which they describe. In 1811 he took up his residence at Alexandria, Va., where his family remained after his death. Few subsequent traces of the life of Lee remain, up to the year 1814. He seems to have been harassed by pecuniary trouble, but not to have discarded his habits of

free living. In 1814 he was in Baltimore when the riots connected with the "Federal Republican" newspaper took place, and exposed himself by the part which he took in them to serious injury. The printing office of the journal was destroyed by the mob, and an attack upon the dwelling of the editor followed. Lee was a personal friend of this gentleman, and with characteristic impetuosity offered to aid him in defending his house. The result was that two of the assailants were killed, and a number wounded; which so inflamed the rage of the crowd, that but for the arrival of the city military Lee and his friends would in all probability have been torn to pieces. They were conducted by the military to the city jail for safety; but during the night the mob reassembled in greater force, broke open the jail, and either killed or shockingly maimed all its inmates. From the injuries which he received on this occasion Lee never recovered. He made a voyage to the West Indies for the restoration of his health, but all his hopes failed. Finding his strength giving way, he returned to the United States in 1818.—In person Lee was above the medium height, well proportioned, and pleasing. His complexion was dark; his manner the frank and open address of a soldier. Self-esteem, based upon the conscious possession of commanding talents, was a marked trait of his character; and in this doubtless originated his misunderstanding with Greene. The opinion formed by that great soldier of his military genius has been stated. The "love and thanks" expressed in a letter to Lee from Gen. Washington in 1789, exhibit the affection which his generous qualities had inspired in the bosom of the chief; and in Virginia he is still known by the name of "Legion Harry" or "Light Horse Harry," in allusion to the rapid and daring movements of his partisan corps in the campaign of the Carolinas. He was father of Robert E. Lee, commander-in-chief of the confederate armies in the civil war.

**LEE, Jesse**, "the Apostle of Methodism in New England," born in Prince George co., Va., March 12, 1758, died in Baltimore, Sept. 12, 1816. At the age of 19 he removed to North Carolina, and in 1779 he preached his first sermon. His ministerial career was interrupted in 1780 by being drafted into the militia to repel the invasion of the British into South Carolina. Refusing to do active military duty, during the four months of his impressment he performed the duties of a chaplain. His first appointment was near Edenton, N. C., and in 1783 he was received into the conference on trial. Being appointed to the Salisbury circuit, N. C., in 1784, he also accompanied Asbury on an extended tour of labor extending from Norfolk, Va., to the extreme S. W. portions of North Carolina, and reorganized the various circuits that had been nearly destroyed by the war. After three years spent in North Carolina, Virginia, Maryland, and New Jersey, at the conference of 1789 he was sent to Stam-

ford circuit, Conn. The peculiarities of Lee's preaching awakened general attention. After visiting Norwalk, New Haven, and other towns, and establishing classes, he visited Boston in 1790, and preached his first sermon on the common. For six years he travelled throughout nearly all New England, penetrating to the remotest N. E. portions, preaching in private houses, in barns, and on the highways, forming new circuits, and directing the labors of his assistants. In 1796 he became an assistant to Asbury in preaching, holding conferences, and superintending the churches. Subsequently to 1800 he spent most of his time in the south. He ever studied the interests of the church, and aimed to perfect her polity. In 1808 he advocated a delegated general conference, a plan that had been suggested by him 14 years before; and this plan was adopted soon after, the general conference thus becoming the supreme authority of the Methodist Episcopal church. In 1807, 1812, and 1813 he was elected chaplain of the house of representatives at Washington, and in 1814 the senate, which office he filled to the time of his death. In 1807 he published a "History of Methodism," which was the first work on that subject, and is a most valuable authority on the early history of this church.—See "Life and Times of Jesse Lee," by Leroy M. Lee (Richmond, 1848).

**LEE, Leroy Madison**, an American clergyman, born in Petersburg, Va., April 30, 1808. He studied law, but entered the ministry of the Methodist Episcopal church in 1828. He occupied important stations in the Virginia conference till 1836, when he was appointed editor of the "Richmond Christian Advocate." He was a member of the general conference of 1844, and took an active part in the events which resulted in the division of the church, and likewise represented the Virginia conference in the convention at Louisville in 1845, when the organization of the Methodist Episcopal church, South, was effected. Retiring from the editorial management of the "Richmond Christian Advocate" in December, 1858, he resumed the work of the itinerant ministry, and is now (1874) presiding elder of the Petersburg district, Virginia conference. Besides occasional sermons, he has published "Letters to a Young Convert," "Life and Times of Jesse Lee" (Richmond, 1848), "Confirmation," and a small volume on "Perseverance."

**LEE, Luther**, an American clergyman, born in Schoharie, N. Y., Nov. 30, 1800. He united with the Methodist Episcopal church in 1821, and soon began to preach. In 1827 he joined the Genesee conference, and was stationed at Malone, N. Y., with a circuit embracing the entire county of Franklin, portions of Clinton and St. Lawrence, and appointments in Lower Canada. During the six years that were spent in the St. Lawrence region, Mr. Lee was engaged in several important doctrinal controversies that produced a very deep impression throughout the country. From 1833

to 1838 he was stationed at Lowville, Watertown, and Fulton. In 1838 he engaged in lecturing against slavery, and in 1841 assumed the editorial management of the "New England Christian Advocate," an anti-slavery journal published at Lowell, Mass. Soon after he issued a paper entitled "The Sword of Truth," and in the autumn of 1842, in connection with the Rev. Orange Scott, he began a weekly journal called "The True Wesleyan." When in 1843 the "Wesleyan Methodist Connection" was organized, he became pastor of a church in Syracuse, N. Y. At the first general conference of the Wesleyan church, he was chosen president; and he was editor of the "True Wesleyan," the organ of that body, published in New York, till 1852, after which he became successively pastor of churches in Syracuse and Fulton, N. Y. In 1856 he was elected president and professor of theology of Michigan Union college at Leoni; but the following year he resigned this office and served churches in Ohio. From 1864 to 1867 he was connected with Adrian college, Mich.; but at the latter date he withdrew from the Wesleyan church and returned to the Methodist Episcopal church, because slavery, the cause of the organization of the former, having been abolished, he saw no sufficient reason for its continuance. Since 1867 he has been a member of the Michigan conference, and now (1874) resides at Northville, Mich. He is the author of the following works: "Universalism Examined and Refuted" (1836); "The Immortality of the Soul" (1846); "Revival Manual" (1850); "Church Polity" (1850); "Slavery Examined in the Light of the Bible" (1855); and "Elements of Theology" (1856).

**LEE, Nathaniel**, an English dramatic poet, born at Hatfield, Hertfordshire, about 1657, killed in London in 1691. He was educated at Trinity college, Cambridge, and on leaving the university tried to push his fortunes at court; but not being successful, he began to write for the stage. From 1675 to 1681 he produced a new play every year. He became insane in 1684, and was confined in Bedlam for four years, when, having recovered his reason, he was liberated and resumed his former occupation. He is said to have lost his life in a nocturnal riot. He was an admirer and imitator of Dryden, whom he assisted in writing "Edipus" and the "Duke of Guise." He was the author of 11 tragedies, two of which, "Theodosius" and "Alexander the Great," were long popular on the stage.

**LEE, Mrs. R. Bowdich**, an English authoress, born about 1800, died in 1856. During a residence in Gold Coast colony, Africa, whither her first husband, Mr. T. E. Bowdich, had been sent on a mission of pacification to the Ashantees, she collected the materials for an interesting work, which appeared in 1825 under the title of "Stories of Strange Lands." Another work of the same character, entitled "The African Wanderers" (3d ed., 1854), has



been highly esteemed for the charm of its narrative and the exactness of its descriptions. Subsequently Mrs. Bowdich resided for many years in Paris, where she married her second husband, Mr. Lee. While there she enjoyed the friendship of Cuvier, of whom she wrote a memoir, and of other eminent authors and naturalists. Her remaining works are for the most part popular treatises on subjects of natural history. Among them are: "Elements of Natural History: Zoölogy;" "Taxidermy;" "Beauties, Uses, &c., of Trees, Plants, and Flowers;" and "Familiar Natural History."

**LEE, Robert Edward**, an American soldier, son of Col. Henry Lee, born at Stafford, Westmoreland co., Va., Jan. 19, 1807, died in Lexington, Va., Oct. 12, 1870. He entered West Point in 1825, and graduated second in his class in 1829. During his whole course he was never reprimanded or received a single mark of demerit. He was appointed lieutenant in the corps of engineers, and from 1829 to 1834 served as assistant engineer in the construction of Forts Monroe and Calhoun at Hampton roads; from 1834 to 1837 as assistant to the chief engineer at Washington; and in 1835 as assistant astronomer for establishing the boundary between Ohio and Michigan. From 1837 to 1841 he was superintending engineer of the improvements of the harbor of St. Louis and of the Missouri and upper Mississippi rivers, having also during 1840 and 1841 the general charge of the improvements in the lower Mississippi and Ohio rivers, below Louisville, Ky. He was made captain in 1838. After 1841, among other services, he superintended the construction and repair of the fortresses at the entrance of the harbor of New York, was assistant to the chief engineer at Washington, and member of the board of the Atlantic coast defences. When the Mexican war broke out he was assigned to duty as chief engineer of the army under Gen. Scott, and served with great distinction during the whole war. He was successively brevetted as major, lieutenant colonel, and colonel, for gallant and meritorious conduct at Cerro Gordo, Contreras and Churubusco, and at Chapultepec, where he was wounded. He afterward served as engineer in various departments, and was superintendent of the military academy at West Point from 1852 to 1855. In 1855 two new regiments of cavalry were formed. Of the second regiment Albert Sidney Johnston was made colonel, Lee lieutenant colonel, Hardee and Thomas majors, Van Dorn and Kirby Smith captains; and among the lieutenants were Hood, Fields, Fitzhugh Lee, Palmer, and Stoneman. Lee served with this regiment in Texas till 1857, when he received leave of absence, and returned to his home in Virginia. Through his marriage in 1832 with Mary, daughter of G. W. P. Custis, the grandson of Martha Custis and adopted son of Washington, he came in 1857 into possession of the estates of Arlington House on the Potomac

and the White House on the Pamunkey. In October, 1859, he was put in command of the forces to suppress the John Brown raid at Harper's Ferry. From February to December, 1860, he was in command of the department of Texas, and afterward received leave of absence. The Virginia convention having on April 17, 1861, passed an ordinance of secession, Lee on the 20th resigned his commission in a letter to Gen. Scott, in which he said: "Save in defence of my native state, I never desire again to draw my sword." To his sister he wrote on the same day: "The whole south is in a state of revolution, into which Virginia, after a long struggle, has been drawn; and though I recognize no necessity for this state of things, and would have forborne and pleaded to the end for redress of grievances, real or supposed, yet in my own person I had to meet the question whether I should take part against my native state. With all my devotion to the Union, and the feeling of loyalty and duty of an American citizen, I have not been able to make up my mind to raise my hand against my relatives, my children, my home. I have therefore resigned my commission in the army, and, save in defence of my native state, with the sincere hope that my poor services may never be needed, I hope I may never be called on to draw my sword." Although Virginia had seceded from the Union, the state had not as yet acceded to the confederacy; and Lee, who at once repaired to Richmond, was appointed major general of the forces of the state. In formally accepting this office, he said: "Trusting in Almighty God, an approving conscience, and the aid of my fellow citizens, I devote myself to the service of my native state, in whose behalf alone will I ever again draw my sword." Early in May Virginia joined the confederacy, the capital of which was removed to Richmond, and the southern congress passed a law appointing five generals, their commissions to rank in the order in which these officers had ranked in the United States army. The commissions as made out by the government were in the following order: S. Cooper, A. S. Johnston, R. E. Lee, J. E. Johnston, and P. T. Beauregard. J. E. Johnston remonstrated against this, claiming that he should have stood first, because he had been a brigadier general in the United States army, while none of the others had ranked higher than colonel. Apparently in consequence of this, Lee was not for a while appointed to any separate command in the field, A. S. Johnston being assigned to the west, and J. E. Johnston to the command in Virginia. Cooper, manifestly unfit to lead an army, remained at Richmond as adjutant general. For more than a year Lee filled no important place in the war. He was nominally merely superintendent of fortifications at Richmond and elsewhere, and seems also to have acted as military adviser to President Davis, and to have performed many of the duties per-

taining to the office of secretary of war. There are only occasional glimpses of him in the unsuccessful operations of the summer and autumn of 1861 in western Virginia. J. E. Johnston, who commanded the confederate forces in Virginia, was wounded at the battle of Seven Pines, May 31, 1862; A. S. Johnston had been killed at the battle of Shiloh, April 6; and the command of the confederate army of northern Virginia, having been held for three days by G. W. Smith, who was disabled by a paralytic stroke, was given to Lee, June 3. The confederate army at Richmond was soon augmented so as to be about equal in numbers to the Union army under McClellan, and on June 26 Lee commenced that series of operations known as the seven days' battles. The result was, that after the concluding battle at Malvern Hill, McClellan fell back to Harrison's Landing, and the siege of Richmond was virtually raised. (See ΣΗΘΚΛΗΘΜΗΝΥ.) Meanwhile the scattered Union forces in northern Virginia had been united under Gen. Pope, under the name of the army of Virginia; and to prevent these from aiding McClellan, Lee moved against them. The result of the operations was the second battle of Bull Run, Aug. 29 and 30, in which Pope was defeated. Lee thereupon entered upon the invasion of Maryland, which was brought to a close by the indecisive battle of Antietam, Sept. 16, 17. He then recrossed the Potomac into Virginia, and moved leisurely up the valley of the Shenandoah into that of the Rappahannock, finally taking up a strong position near Culpeper Court House. McClellan followed after considerable delay, and early in November the two armies were close together. McClellan seems to have been preparing to attack, when on Nov. 7 he was superseded by Burnside, who proposed a new plan of operations, by which the Union army was to move up the Rappahannock to Fredericksburg, cross the river there, and thence move directly toward Richmond. But when Burnside reached Falmouth, opposite Fredericksburg, he found that the bridges had been destroyed, and before pontoons could be brought up Lee had arrived and taken up a position on the opposite bank. Burnside at length crossed the Rappahannock, attacked Lee in his positions, Dec. 13, and was signally defeated. Hooker, Burnside's successor, instead of assailing Lee in front, turned his left flank, and gained his rear. Then ensued the battle of Chancellorsville, May 2-4, 1863, in which Hooker was worsted. After this battle Lee gathered all the available forces in the Carolinas and Virginia, and moving northward entered upon what proved an invasion of Pennsylvania. The Union army was now commanded by Meade, and the positions and strength of the two armies were such that a conflict soon became inevitable. By mere accident the encounter took place at Gettysburg, July 1-3, 1863. On the first day, when only parts of each army were present, the confed-

erates gained decided advantages. On the second day they appeared to have the best of it, although their advantages were apparent rather than real. On the third day they met a signal repulse, but were not routed; and Lee retreated in good order to the Potomac, intending to cross at once into Virginia. But the river had been swollen by rains so that it was now unfordable, and he intrenched himself upon the northern bank, where Meade after a circuitous march came upon him. On the 12th Meade was inclined to make an attack at once, but yielding to the opinion of a council of war postponed it until the next day. During the night Lee, who had succeeded in building a bridge, crossed the river, which had in the mean while become fordable in places, and was again safe in Virginia. He fell back to the Rapidan, followed closely and occasionally annoyed by Meade, and the two armies took up positions confronting each other. During the autumn and winter of 1863 there were no important operations in Virginia, and considerable portions of both armies were sent to the west. In October Lee undertook a movement apparently threatening Washington, and to counteract this Meade fell back as far as Centreville, a few miles from the twice-fought battle field of Bull Run, where he made a stand. Lee saw that his force was too small to carry out his design, and he returned to his old position, followed by Meade. Late in November Meade undertook an offensive operation, directed against Lee's right, which lay near a little stream called Mine run, almost within the borders of the region known as the Wilderness. This proved unsuccessful, and closed the active operations in Virginia during the winter of 1863 and the early spring of 1864. Gen. Grant, having been made commander-in-chief, as lieutenant general, decided to conduct in person the campaign in Virginia. Lee's army had lain in winter quarters on the south bank of the Rapidan, their lines, strongly intrenched, covering a space of about 20 m. When the spring campaign opened Lee had about 60,000 men; to oppose these Grant had about 140,000. Grant, while perceiving that the confederate army, rather than any geographical point, was the main object of the campaign, thought it advisable not to assail it in front, but to turn it by the right. The movement commenced on May 4. The Rapidan was crossed without opposition, and the army headed southward. The line of march lay through the western verge of the Wilderness. Grant seems to have assumed that Lee, finding his flank fairly turned by a greatly superior force, would fall back toward Richmond. But Lee resolved to attack the enemy while moving through this wooded region, in which the superiority of the federal force would be in a great measure neutralized by the character of the country. The attack was skillfully conceived and boldly executed. The result was the bloody but indecisive battle of the Wil-

derness, May 5, 6. (See WILDERNESS, BATTLE OF THE.) The armies were now in an apparent deadlock. Each threw up intrenchments in its front, which, though apparently slight, were sufficient to give a great advantage to the one receiving the attack, which neither commander was inclined to venture. To remove this deadlock Grant undertook to outflank Lee by marching upon Spottsylvania Court House. Lee perceived the movement, and, though mistaking Grant's objective point, reached that place first, where his forces intrenched themselves, and severe fighting ensued, culminating in a bloody but indecisive battle on May 12. On the 18th Grant moved southward from Spottsylvania, proposing to outflank Lee's right, thus compelling him to fall back toward Richmond, and the campaign took the form which it maintained as long as operations were carried on in the open field. The two commanders were so constituted that either was able to divine the intent of the other, and to take the best measures to thwart it. Grant, having a great preponderance of force, undertook to strike wherever there was any likelihood that the blow would be effective; and, whenever he found the enemy posted too strongly to be directly dislodged, to manœuvre him out of his position by turning it. Lee stood more directly upon the defensive, but was always upon the alert for an opportunity to strike an offensive blow. The general result was that each commander failed in every directly offensive effort; but Lee was gradually forced back toward Richmond until the close of May, when the confederates stood at bay on the Chickahominy, occupying essentially the ground which the Union army had held two years before, but strongly intrenched. If the confederate army could be defeated here, its ruin was certain, for the Chickahominy interposed an insuperable barrier to further retreat. Grant made an attack on June 3, which was signally repulsed. (See CHICKAHOMINY.) For ten days more the two armies confronted each other, both being strongly intrenched, and neither venturing any attack in force. At length, on June 12, Grant broke from his position, marched down the Chickahominy to the James, which he crossed, and took up a position near Petersburg, from which Richmond could be assailed on the south. Lee crossed the Chickahominy and the James, and undertook the defence of the confederate capital. Richmond itself was so strongly fortified that no direct attack upon it was feasible; but Petersburg, 22 m. S. of Richmond, commanded the railroads by which supplies must be mainly brought to the army at the capital, and the capture of Petersburg would involve the necessity of the abandonment of Richmond. The subsequent operations in Virginia thereupon resolved themselves mainly into the siege and defence of Petersburg. This lasted until April, 1865, when, Grant having fairly passed around the extreme right of the confederate defences, and having broken

through the lines, Lee abandoned Petersburg and Richmond, April 2. He had suffered heavy losses within the last few days; but he still had, if all could be concentrated, about 40,000 men, with which he hoped to be able to reach the mountainous region of the valley of Virginia, where the contest might be prolonged indefinitely; or perhaps to effect a junction with J. E. Johnston in North Carolina, and thence transfer the seat of war to the gulf states. But a series of disasters marked the retreat. The confederate army moved almost without provisions, and the supplies which Lee had ordered to await him at Amelia Court House were by some accident carried on to Richmond, which had been given up to the enemy. Grant in the mean while took up a vigorous pursuit. The confederates were obliged to scatter through the poor country in quest of food, a great portion of the men throwing away their arms. When on the 8th the small part which still retained a military organization had reached the neighborhood of Appomattox Court House, they found their way barred by a superior federal force, which had outstripped them. Grant had on the previous day sent a message to Lee to the effect that the result of the operations of the last week evinced that there was no hope of any further successful resistance on the part of the army of northern Virginia, and demanded its surrender, in order to avoid any further shedding of blood. Lee replied that he was far from being convinced that resistance was useless, but asked to know the terms upon which a surrender would be received. Grant named as the sole condition that "the men and officers surrendered shall be disqualified for taking up arms again against the government of the United States until properly discharged." Lee hesitated until the 9th, hoping for some favorable turn; but none occurring, and yielding to the opinion of his best officers, he on that day met Grant, and the terms of surrender were formally agreed upon, the substance being that the officers and the men under their command "shall not hereafter serve in the armies of the Confederate States or in any military capacity against the United States of America, or render aid to the enemies of the latter, until properly exchanged in such manner as shall be mutually approved by the respective authorities;" and that they "will not be disturbed by the United States authorities so long as they observe their parole and the laws in force where they reside." The list of paroled prisoners contained 27,805 names, but of these hardly a third had arms in their hands. Although Lee had in February been appointed general-in-chief, with the command of all the forces of the confederacy, the capitulation only applied to the army in Virginia; but the surrender of this army virtually brought the war to a close. After the war Lee retired into private life, refusing even to attend public gatherings of any description.

His own fortune had been almost entirely swept away during the war, and in October, 1865, he accepted the presidency of Washington college at Lexington, Va., where in a short time the students numbered nearly 500. In March, 1866, he appeared as a witness before the reconstruction committee of congress. His testimony was to the effect that, as far as he knew, the people of the south did not contemplate any resistance or opposition to the government of the United States, and were in favor of the reconstruction policy of President Johnson; that they expected to pay their portion of the national debt, and would probably, if able, be willing also to pay their share of the confederate debt; and that the people of Virginia looked upon the action of the state in withdrawing itself from the government of the United States as carrying the individuals of the state along with it; that the state, not individuals, was responsible, and that the state was merely using a lawful reserved right. On the evening of Sept. 28, 1870, while apparently in his usual health, he was struck with paralysis, and never fully recovered, although he lived a fortnight longer. His wife, Mary Custis, great-granddaughter of Martha Custis (afterward the wife of Washington), born at Arlington House in 1806, died at Lexington, Nov. 6, 1873.—Gen. Lee had three sons and four daughters. One of the daughters died during the war. His sons all served in the confederate army. G. W. CUSTIS LEE, born about 1833, graduated at West Point in 1854, resigned his commission as lieutenant of engineers in May, 1861, entered the confederate service, became aide-de-camp to President Davis, and subsequently a general of infantry, and succeeded his father as president of Washington college, now called Washington and Lee university. The second son, W. H. F. LEE, became a general of cavalry; and the third, ROBERT E. LEE, served as a member of the cavalry staff. A nephew, FITZHUGH LEE, born about 1835, graduated at West Point in 1856, served as lieutenant of cavalry, mainly in Texas, till 1861, when he resigned his commission, entered the confederate service, and rose to be a general of cavalry.—See "Life of Robert E. Lee," by John Esten Cooke (New York, 1872); *Le général Lee*, by Edward Lee Childé (Paris, 1874); and "Personal Reminiscences of Gen. Robert E. Lee," by Rev. J. W. Jones (New York, 1874).

**LEE, Samuel**, an English scholar, born at Longnor, May 14, 1783, died at Barley, Dec. 16, 1852. He was educated at a charity school, and at the age of 12 was apprenticed to a carpenter. While laboring at his craft he mastered the Latin, Greek, Hebrew, Chaldaic, and Syriac languages. He subsequently acquired a knowledge of Arabic, Persian, French, German, and Italian, with the assistance of Archdeacon Corbett, who in 1810 procured his appointment to the mastership of a foundation school at Shrewsbury. He entered Queen's college, Cambridge, in 1813, graduated in due course,

took orders, and in 1819 became professor of Arabic at his university. In 1831 he was elected regius professor of Hebrew in the university of Cambridge, which in 1833 conferred on him the degree of D. D., an honor received by him more than ten years before from the German university of Halle. His chief publications were: "Hebrew Grammar" (1830); "The Travels of Ibn Batuta," translated from the Arabic (1833); a translation of Job (1837); a "Hebrew, Chaldaic, and English Lexicon" (1840); and "An Inquiry into the Nature, Progress, and End of Prophecy" (1849).

**LEE, I. Sophia**, an English authoress, born in London in May, 1750, died at Clifton, near Bristol, March 13, 1824. She was the daughter of an actor, who was originally a lawyer, and made her first appearance before the public in 1780 as the author of a comedy entitled "The Chapter of Accidents," which was brought out at the Haymarket theatre with great success. In the succeeding year she removed with her sisters to Bath, where she devoted the profits of her play to the establishment of a young ladies' seminary, over which she and her sister Harriet presided for many years. In 1785 she published "The Recess," a historical tale of a rather sombre character, which attained considerable popularity, and which was followed by "Almeyda," a tragedy, performed with moderate success; "The Life of a Lover," a novel in 6 vols.; and an unsuccessful comedy, "The Assigination." She also furnished "The Young Lady's Tale" and "The Clergyman's Tale" to the series of "Canterbury Tales," written by her sister Harriet and herself, which are considered her best productions. She gave up her seminary in 1803, and passed the remainder of her life in retirement. Her conversational powers were remarkable.

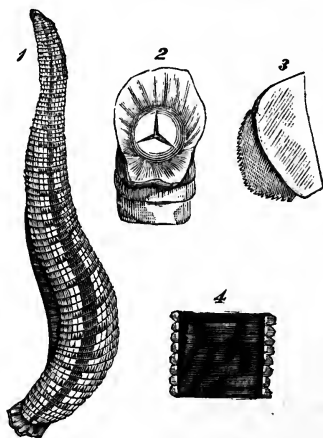
**II. Harriet**, sister of the preceding, born in London in 1756, died at Clifton, Aug. 1, 1851. Her first appearance as an authoress took place in 1786, when she published "The Errors of Innocence," a novel in 5 vols., succeeded by several others now forgotten. In 1797 appeared the first volume of the "Canterbury Tales," followed at intervals of a few years by four others under the same title, the contents of which were for the most part of her composition. They enjoyed a great popularity in the early part of the century; and a new edition was published in New York in 1856-'7 (3 vols. 12mo). One of the most remarkable is "The German's Tale: Kruitznor," from which Lord Byron borrowed not merely the plot and the machinery down to the most trivial incidents, but in some instances the language, of his "Werner." She also produced two dramas, "The New Peerage" and "The Three Strangers," the latter of which failed at Covent Garden in 1835.

**LEE, William**, an Irish clergyman, born in 1815. He was educated at Trinity college, Dublin, of which he was elected fellow in 1839; appointed professor of ecclesiastical his-

tory in 1857, and Archbishop King lecturer in divinity in 1863; and is now (1874) arch-deacon of Dublin. He has published a number of works, among which are the Donellan lectures for 1852, "Inspiration of Holy Scripture, its Nature and Proof" (1852; 4th ed., 1865); "Three Introductory Lectures on Church History" (1858); "Progress of Astronomy" (1860); "Translations in English Verse of Ovid, Horace," &c. (1860); and "Recent Forms of Unbelief" (1864).

**LEECH**, a red-blooded, footless, smooth-bodied, abranchiate annelid of the family *hirudinei*, and genus *sanguisuga* (Sav.) or *hirudo* (Linn.). The body is soft, retractile, composed of numerous segments, with a sucker at the posterior extremity, serving both to attach and to move the animal. The muscular system is well developed, closely embracing the viscera; the sucker has both circular and radiating fibres. The nervous system consists of a large anterior cerebral ganglion, and a chain of ventral ganglia connected by two contiguous cords; the ganglia are fewer than the segments, the first and last being the largest, the former sending filaments to the lips, and the latter to the sucker; there is also a splanchnic system of small anterior ganglia which send filaments to the parts about the mouth and to the intestinal canal. The sense of touch is particularly developed at the anterior extremity. There are ten eye specks symmetrically arranged upon the neck, each a transparent cylindrical body bulging out under the skin like a cornea, enveloped in a layer of black pigment, receiving a filament from the cephalic ganglion, according to Wagner having a lens and a vitreous body (though this is denied by others), and constituting light-perceiving if not light-refracting organs. The flattened body tapers toward each end, the mouth being at the anterior extremity and provided with a sucking apparatus; at the base of the pharynx are three fleshy swellings, the projecting border of which is edged with bicuspid teeth, causing wounds shaped like a three-rayed star. The intestinal canal is straight, but deeply constricted in many places, each such portion sending off short cæca on each side; the anal opening is on the back directly above the posterior sucker. There are salivary glands around the commencement of the intestine, and a glandular hepatic organ envelops a great part of this canal. The blood contains colorless granulated globules; there is a central contractile vessel, and a circulation and oscillation in longitudinal and lateral vessels. Respiration is effected by means of 17 pairs of internal branchiæ or aquiferous canals without ciliated epithelium, opening upon the ventral surface of the body, and surrounded by a network of blood vessels. Reproduction is effected by sexual organs, and the two sexes are united in the same individual, they being true hermaphrodites; the eggs, from 6 to 15, are contained in a cocoon, surrounded by a thick spongy substance said to be ejected from the mouth, de-

posited near the edge of the water, and hatched by the heat of the sun; the young leave the egg without undergoing any metamorphosis. The leech inhabits the water principally, and swims with a vertical undulating motion; out of the water it moves by the disks or suckers, fastening itself first by one and then by the other, alternately stretching and contracting the body; it is torpid in winter, hiding in the mud; it can live a long time in sphagnous moss or in moist earth, and can thus be transported for long distances. Leeches live at the expense of other animals, whose blood they suck; they attach themselves to fishes, batrachians, invertebrates, and to mammals and men that venture into the fresh water inhabited by them. Many species are used for medical purposes, of which the most common are the gray and the green leeches of Europe (*S. medicinalis* and *officinalis*, Sav.); generally considered varieties of one species; both have six longitudinal ferru-



Leech (*Sanguisuga medicinalis*).

1. Leech. 2. Anterior extremity magnified. 3. Jaw detached, magnified. 4. Part of belly magnified.

ginous stripes on the back, the four lateral ones interrupted by black spots; the back varies from blackish to grayish green; the under parts in the first variety are greenish with black spots and edgings, in the second yellowish green without spots; the length varies from 2 to 4 in. They formerly inhabited in great numbers the marshes and streams of most countries of Europe; but of late years the demand for medical purposes has exhausted most of the localities in central and southern Europe; the Swedish leeches are now generally considered the best. There are many American species, of which the *hirudo decora* (Sav.) is extensively used in the interior of the middle states; the color is deep greenish above with three rows of square spots, the central brownish orange, and the lateral black; the under parts are spotted with black; it varies in length from 3 to 5 in.; it is especially abundant in Pennsylvania, and several hundred thousand are employed annu-



ally.—Leeches afford the least painful and in many cases the only practicable means of local depletion, and are precious instruments in the hands of the physician. They will generally bite eagerly, and will draw from a quarter of an ounce to an ounce of blood, according to the vigor and size of the animal and the vascularity of the part to which it is applied; when full they drop off, though they will sometimes continue to draw after their tails are cut off; the application of a little salt will make them drop at any time; bathing the part with warm water will increase the quantity of blood lost. When gorged with blood, digestion may not be completed for many months; hence it is customary to strip them by drawing the body between the fingers from the tail to the head, the little that remains serving to keep them in good condition for a long time, if they be kept in clean and frequently changed water. Full leeches are liable to disease and to induce it in others, and should be kept by themselves, not to be used until they have regained their activity; as they often change the slimy coat on their skin, they require moss and roots to draw themselves through in order to keep healthy. In the rare cases in which leech bites bleed too long, the flow may be arrested by pressure, alum solution, caustic, or a superficial suture. The application of leeches requires some skill and attention, and is often usefully placed in the hands of special practitioners, both male and female.—The horse

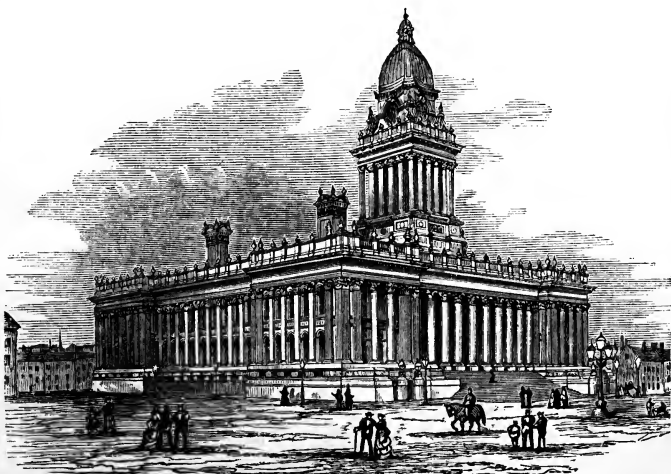
leech (*hæmopsis*, Sav.) is a larger species, differing principally by the oval and slightly toothed jaws; it will not attack man, and it is doubtful if it attaches itself to horses and other animals; it devours other worms, swallowing them whole.—The leech family is a large one, and can be studied only in special treatises, of which a long list is given in the chapter on annelids in Siebold's "Comparative Anatomy."

**LEECH, John**, an English artist, born in London about 1817, died Oct. 29, 1864. He was educated at the Charterhouse, and soon after the establishment of "Punch" brought himself into notice by his humorous illustrations for that serial. Several thousand sketches, illustrating the politics, fashions, and follies of the day, testify to the industry of his pencil and the fertility of his invention; and the greater part of these, though hastily thrown off, have artistic merit as well as humor, the drawing and expression being in most cases excel-

lent. The social extravagances of England never found a more apt or kindly delineator; but in sporting scenes, particularly those in which the horse is introduced, he was pre-eminent. He was connected with "Punch" almost from its establishment, and from time to time he published collections of his pictorial contributions to its columns, entitled "Pictures of Life and Character, from the Portfolio of Mr. Punch," each containing 500 woodcuts. He illustrated several of Albert Smith's novels, the "Comic History of England," &c., and published under his own name, "The Rising Generation, a Series of Twelve Drawings on Stone" (1848), and other works.

**LEEDS**, a N. E. county of Ontario, Canada, on the N. bank of the river St. Lawrence, near Lake Ontario; area, 895 sq. m.; pop. in 1871, 35,302. It has a rough, hilly surface, diversified by a number of small lakes in which rise Cataragui and Rideau rivers. The soil is generally fertile. Wheat, oats, potatoes, Indian corn, peas, buckwheat, and rye are the principal productions. It is traversed by the Grand Trunk and the Brockville and Ottawa railroad. Capital, Brockville.

**LEEDS**, a municipal and parliamentary borough of the West riding of Yorkshire, England, situated on both sides, but chiefly on the left, of the navigable river Aire, 22 m. W. S. W. of York and 206 m. by railway N. N. W. of London; pop. in 1851, 172,270; in 1871,



Town Hall, Leeds.

259,212. Its site was probably at one time a Roman station; its mediæval name (Loidis) is Saxon. As a manufacturing town it dates back only to the 16th century. The principal and best part of Leeds stands on the slope of a hill N. of the Aire. Most of the town is irregularly built, with narrow and crooked streets; but in the centre and west the streets are wide and handsome, being lined with modern build-

ings. Two stone bridges and four of iron cross the river, on the S. side of which are the extensive suburbs of Holbeck and Hunslet. The streets are well paved and the sidewalks flagged and lighted with gas, and an abundant supply of water is conveyed from the Harewood hills, 5 or 6 m. distant. There are many handsome public buildings, especially the town hall, completed in 1858. Improvements are in steady progress. The largest buildings are the cloth halls, in which the cloth markets are held, the commercial buildings, three market houses, the corn exchange, the court house, with a bronze statue of Sir Robert Peel in front of it, the town hall, the stock exchange, the jail, the cavalry barracks, &c., and the places of public amusement. Many of the churches are large and elegant buildings. In 1871 there were 225 places of worship, of which 73 belonged to the church of England. The Leeds free grammar school, founded in 1552, is endowed with an income of about £2,000 per annum. The industrial school at Burmantofts, opened in 1848, is a large and very complete establishment, the buildings forming a capacious and ornamental Elizabethan pile, and the grounds covering six acres. Leeds possesses an excellent library founded by Dr. Priestley in 1768; the library and museum of the literary and philosophical society; a mechanics' institution, a school of design, a medical school, &c. The charitable institutions are: the Leeds infirmary with 150 beds, the house of recovery for fever patients, a dispensary, an eye and ear infirmary, a lying-in hospital, and several almshouses for the poor and aged. Leeds is particularly distinguished for its musical festivals. In woollen manufactures it now surpasses all other English cities, and more leather is tanned here than at any other place in the British empire. For a long time only the coarser kinds of woollens were manufactured, but cloths are now produced which for fineness and colors cannot be surpassed. About 12,000 persons are employed in the woollen manufacture in more than 100 factories; about an equal number of persons are employed in flax spinning and weaving. Nearly a quarter of the whole population are employed in the various manufactories. Notwithstanding this increased prosperity, there is still much pauperism. No other town in England is so admirably situated for trade, being placed in the heart of the inland navigation of the country. It communicates with the sea eastward by means of the Aire and Calder navigation to the Humber, and westward by the Leeds and Liverpool canal to the Mersey. The warehouses of the Aire and Calder company are of great dimensions, and there are convenient docks. Leeds is also the centre of a network of railways converging to it from all parts of the country, and placing it in connection with every important town of the kingdom. In the surrounding district there are more than 100 collieries. About 2 m. from Leeds are the ruins of Kirkstall abbey.

**LEEK** (*allium porrum*), a plant of the same genus with the onion, a native of the shores of the Mediterranean, and naturalized in other parts of Europe. It has been long in cultivation, and was probably known to the ancient Egyptians. Like the onion it is a biennial, but differs from that in having flat leaves, and in not forming a large flattened bulb; in the leek the lower part of the plant, which may be regarded as an elongated nearly cylindrical bulb, is the edible portion, the size of which is increased in cultivation by drawing the earth up around it. The seeds are sown in spring in very rich ground, and the plant is given the same cultivation as the onion, and is ready for use in the fall. Leeks cannot, like the onion, be kept in the dry state, but if required for use during winter must be preserved in trenches, like celery. In mild climates they may pass the winter in the open ground without protection. The second year the plant throws up a stem 2 to 3 ft. high, which bears an umbel of



Leek.

white flowers marked with purple. Though the odor and flavor of the leek are decidedly alliaceous, they are very distinct from those of the onion; and it is much used, especially by Europeans, as an ingredient in soups and stews. The dish "cock-a-leekie," known at least by name to the readers of Scott, is a favorite with the Scotch; it consists of an old fowl stewed to tenderness with an abundance of leeks.—Several native and one introduced species of *allium* are known to farmers as wild leek and wild garlic. They are objectionable in pastures, as they impart to the milk and butter from the cows which feed upon them a most disagreeable odor. One species which occurs in wheat fields, bears small bulblets instead of seeds; these are not much larger than a grain of wheat, and when mixed with the grain injure the flour. Good cultivation and a proper rotation of crops are the only remedy.

**LEELANAW**, a N. W. county of the S. peninsula of Michigan; area, about 1,000 sq. m.; pop. in 1870, 4,576. It occupies a peninsula formed by Grand Traverse bay and Lake Michigan. The chief productions in 1870 were 24,112 bushels of wheat, 19,989 of Indian corn, 15,322 of oats, 84,343 of potatoes, 53,971 lbs. of butter, 37,056 of maple sugar, and 1,607 tons of hay. Value of live stock, \$123,022. There were 5 flour mills and 7 saw mills. Capital, Northport.

**LEEMANS, Conradus**, a Dutch archæologist, born at Zalt Boemel, Gelderland, April 28, 1809. He studied theology and archæology at the university of Leyden, and in 1839 became director of the museum of that city. In 1859 he was commissioned by government to establish at Leyden a national ethnographic museum, of which he has the direction, and to which was added Siebold's Japanese collection. He has published a critical edition of the *Hieroglyphica* of Horapollo (Leyden, 1835), *Description raisonnée des monuments égyptiens du musée à Leyde* (1840), *Papyri Græci Musei Lugduno-Batavi* (vol. 1., 1843), and several other works upon Egyptian, Greek, and Roman antiquities. He has also published a description of the Asiatic and American antiquities in the museum of Leyden (1842). His most important work is *Aegyptische monumenten van het museum van oudheden te Leyden* (23 parts, 1835-'65).

**LEEB**, a seaport town of Prussia, in the province of Hanover, on the Leda, about 1 m. above its entrance into the Ems, and 16 m. S. of Aurich; pop. in 1871, 8,932. It has three churches (Reformed, Lutheran, and Catholic), a Mennonite meeting house, a synagogue, a gymnasium, and an industrial school. It has considerable navigation and ship building, and an increasing number of manufactories.

**LEES, Frederic Richard**, an English temperance orator, born at Meanwood Hall, near Leeds, Yorkshire, March 15, 1815. When 19 years old he connected himself with the temperance cause, and in the following year with the total abstinence movement. From 1837 to 1840 he held various discussions with the Owenites, and published in 1838-'9 "The Metaphysics of Owenism Dissected." From 1841 to 1844 he gained several prizes for essays on temperance; and in 1856 he gained £100, offered by the United Kingdom alliance for an argument for the legislative prohibition of the liquor traffic. In 1843 he held a discussion with Mr. Jefferson, a surgeon, in which he explained the bearing of the discoveries of Liebig on the temperance question. In 1845 he started "The Truth Seeker in Literature, Philosophy, and Religion," a magazine devoted to free and catholic inquiry, and to transcendental and spiritual philosophy, which continued through six volumes. In 1848 he held discussions with several of the physicians of Newcastle, and was presented with a public testimonial. In 1853 he visited the world's temperance con-

vention in New York as the representative of the British temperance association of the north of England. In 1860 he received a public testimonial of 1,000 guineas from the friends of temperance in Great Britain. He is the author of a "History of Alcohol" (1843), and of a "Treatise on Logic, or the Method, Means, and Matter of Argument."

**LEESER, Isaac**, an American rabbi, born in Neukirch, Westphalia, Dec. 12, 1806, died in Philadelphia, Feb. 1, 1868. In 1825 he emigrated to the United States, where for a short time he devoted himself to commerce. In 1829 he became rabbi of the principal synagogue of Philadelphia, and acquired reputation by his contributions to literature, referring principally to Jewish history and theology. For several years he edited "The Jewish Advocate" (or "Occident"), a journal devoted to the interests of his creed. Among his works are: "The Jews and the Mosaic Law" (1833); "Discourses, Argumentative and Devotional" (1836-'40); "Portuguese Form of Prayers" (1837); a "Descriptive Geography of Palestine;" and a translation of the Hebrew "Holy Scriptures" according to Jewish authorities (1856). He also published an edition of the Hebrew Bible (1866).

**LEEUWARDEN**, a town of Holland, capital of the province of Friesland, situated in a fertile plain on the Ee, 10 m. from the sea, and 70 m. N. E. of Amsterdam; pop. in 1872, 26,264. It is well built, intersected by numerous canals, and connected by others with Harlingen, Groningen, and Delfzyl. The principal buildings are the ancient palace of the princes of Orange, the government house, and the old Landhuis. It has a society for Frisian history, antiquities, and language, a natural history society, a gymnasium, a musical school, a school of design, 12 churches, and various manufactories.

**LEEUWENHOEK, or Leeuwenhoek, Antonius van**, a Dutch naturalist, born in Delft, Oct. 24, 1632, died there, Aug. 26, 1723. He had no learned education, and in early life was engaged in mercantile pursuits. He cultivated science during his spare moments, and attained the reputation of making the best microscopes in Europe. By his applications of the microscope, and by the researches in physiology to which they conducted him, he attracted the attention of the royal society of London; and the greater part of his writings, containing accounts of his discoveries, were published in the English "Philosophical Transactions." He was among the first observers to employ the microscope in anatomical and physiological investigations, of which he made a great number by means of simple microscopes of his own construction. These instruments consisted of a single biconvex lens, fixed in a perforated metallic plate, to which was attached a movable needle destined to carry and fix in a proper position the object to be examined. Though of such simple construction, they were often of very high magnifying power, owing to the

strong convexity of the surfaces of the lens. Leeuwenhoek was particularly distinguished for his discovery of the red globules of the blood in 1673, that of the infusorial animalcules in 1675, and that of the spermatozoa in 1677. Malpighi had seen and mentioned as early as 1661 what were undoubtedly the blood globules; but he did not perceive their true nature nor give an exact description of them. Leeuwenhoek discovered their existence and their most important characters in human blood as well as in that of birds, reptiles, and fishes. The spermatozoa were first seen by a student of medicine named Ham. He immediately communicated the fact to Leeuwenhoek, who at once verified the reality of the discovery in the human spermatic fluid, and extended it to that of the dog, the rabbit, the ram, the cock, and various other animals. The infusorial animalcules he discovered in the rain water which ran from the roof of his house. Leeuwenhoek's life was passed in scientific research and in manufacturing optical instruments in his native city. He was visited by Queen Mary, and was invited to visit the czar Peter when that sovereign was in Delft. His writings were collected and published in Dutch separately at Delft and Leyden. They also appeared in Latin (Delft, 1695), and a selection of his works, containing his microscopical discoveries in many departments of nature, translated into English by Samuel Hoole, was published in London, 1798-1801.

**LEEWARD ISLANDS**, a name applied by European navigators and geographers to such of the Lesser Antilles as lie between lat. 15° and 19° N., comprising the British islands Dominica, Montserrat, Nevis, Antigua, Barbuda, St. Christopher, Anguilla, and the Virgin group, the French islands Guadeloupe and Marie Galante, with the Danish and Swedish and most of the Dutch possessions in these waters. The English Leeward islands, which in 1872 received a common administration under a governor-in-chief, have an area of 733 sq. m.; pop. in 1871, 120,491. The islands lying south of lat. 15° N. along the northern coast of South America are called Windward islands. American geographers generally reverse these appellations.

**LEFEBVRE, Charlemagne Théophile**, a French traveller, born in Nantes in 1811, died in Paris in 1859. He was an officer in the navy, and explored several regions, especially Abyssinia. His companions, the naturalists Dillon and Petit, died in that country, where upon his last journey he contracted a fever which ultimately proved fatal. The *Voyage en Abyssinie, exécuté pendant les années 1839-'43* (6 vols., Paris), was published by the government at the request of the academy. For this work Lefebvre wrote the first two volumes, and a portion of the third.

**LEFEBVRE, François Joseph**, duke of Dantzic, a French marshal, born at Ruffach, Alsace, Oct. 25, 1755, died in Paris, Sept. 14, 1820. He was the son of a miller who had served

in the hussars, enlisted in 1773 as a private soldier, was a sergeant at the commencement of the revolution, was rapidly promoted to the rank of general of division (Jan. 10, 1794), and distinguished himself on many occasions by his bravery, especially at the battle of Fleurus (1794). On June 4, 1796, he led the van of Kléber's army in the attack on the Austrian position at Altenkirchen, and on March 25, 1799, at the battle of Stockach, maintained his ground for several hours with 8,000 men against a force of 36,000 Austrians. Having aided Bonaparte to overturn the directory, he was appointed to the command of the military in and around Paris, became a senator, and in 1804 was made a marshal of France. In 1806 he accompanied Napoleon against Prussia, and in the battle of Jena commanded the foot guards. He was next placed in command of the forces sent to reduce Dantzic, which surrendered May 24, 1807, after a siege of 51 days; and on the 28th he received the title of duke of Dantzic. He subsequently served in the peninsula, was present in 1809 at the battles of Eckmühl and Wagram, and participated in the Russian expedition as commander of the imperial brigade. On the downfall of the emperor, Louis XVIII. created him chevalier of St. Louis and a peer of France; but having retained his seat in the imperial senate during the hundred days, he was excluded on the second restoration from the chamber of peers. His rank was restored to him in 1819.

**LEFEBVRE-DESNOUETTES, Charles**, count, a French general, born in Paris, Sept. 14, 1773, lost at sea near Kinsale, Ireland, April 22, 1822. He ran away from college to enter the army, served under Dumouriez in 1792, was an aide-de-camp to Bonaparte at Marengo, became colonel in 1804, and distinguished himself at Austerlitz. He became brigadier general in 1806 and general of division in 1808, began the siege of Saragossa, but soon afterward joined the corps of Bessières, and was taken prisoner and sent to England. While on parole, he escaped to France, and Napoleon gave him command of the chasseurs of the guard in the campaign of 1809 against Austria. He participated in the invasion of Russia, contributed largely to the victory of Bautzen (May 21, 1813), was beaten at Altenburg, Sept. 28, by Platoff and Thielmann, and on Oct. 30 gained a brilliant advantage over a corps of Russian cavalry. He led the cavalry at Brienne, Jan. 29, 1814, and received several wounds. He remained at the head of the chasseurs after Napoleon's abdication, but espoused his cause on his return from Elba, and was obliged to fly in disguise. He was named a peer by Napoleon on his arrival at Paris, and fought with great intrepidity at Fleurus and Waterloo. After the second restoration he was condemned to death and fled to the United States, where he attempted to found a colony of French refugees at the south. On his way to Belgium, hoping to reënter France, he perished by shipwreck.

**LEFÈVRE** (called also **FAVRE**, **FAIVRE**, and **FABER**), **Pierre**, the first associate in Paris of Ignatius Loyola, born at Villaret, Upper Savoy, April 13 or 14, 1506, died in Rome, Aug. 1, 1546. His parents were peasants, but he received a classical education, graduated at the university of Paris in 1530, and began to lecture on philosophy at the collège Ste. Barbe, where Ignatius Loyola was his pupil. He was ordained priest in 1534, and in 1537 went to Rome and obtained for Loyola and his companions the pope's consent to their going to Palestine. In November he was appointed professor of theology in the Sapienza college at Rome, and was chosen in 1538 to visit and reform the diocese of Parma. He was the first Jesuit to enter Germany, where he labored with great success at Worms, Spire, Nuremberg, Mentz, and Cologne, disputing publicly with the reformers when necessary, but chiefly confining himself to persuade nobles, clergy, and people to lead edifying lives. He visited the Netherlands twice; went to Portugal at the request of King John III. in 1544, and regulated the college founded at Coimbra for the education of young Jesuits; founded in Spain the Jesuit colleges of Valladolid, Alcalá, Madrid, Valencia, and Gandia; and visited and reformed several dioceses by order of the bishops. He was recalled to Rome in February, 1546, set out on foot, and died of a violent fever soon after his arrival. He had stopped for a few days at Villaret while on his way to Spain in 1543, and did much to instruct and elevate the people who flocked from every direction to see him. Even then they called him "blessed" and "saint." After his death they canonized him spontaneously. A chapel was built in his memory near his father's house, with the sanction of the bishop. This *cultus* was approved by St. Francis of Sales, who visited and embellished the chapel. St. Francis Xavier placed his name in the litany of the saints; and this veneration was shared by St. Ignatius and St. Francis Borgia. In 1872, in response to a petition of the bishop and clergy of Annecy, the congregation of rites approved (Aug. 31) the honor paid in Savoy to the Blessed Pierre Lefèvre, and this was confirmed by Pius IX., Sept. 5. His feast is celebrated on Aug. 1.—See Father Giuseppe Boero, "Life of the Blessed Peter Favre," containing a "memoir" or autobiography of the saint (translated from the Italian, London, 1873).

**LE FLÔ**, **Adolphe Emmanuel Charles**, a French soldier, born at Lesneven, Finistère, Nov. 2, 1804. He served in Algeria, and in 1848 attained the rank of brevet brigadier general, and was sent as envoy to St. Petersburg. Returning to France in March, 1849, he became a member of the constituent assembly, and subsequently of the legislative assembly. He evinced decided hostility to the schemes of Louis Napoleon for the restoration of the empire, and was among the first members arrested on Dec. 2, 1851. He lived in exile till 1859,

when he returned to France. In 1870-'71 he was minister of war in the government of national defence, and afterward in that of Thiers. He was also returned for Brest to the national assembly at Bordeaux, in which, however, he took no prominent part. In the summer of 1871 he was sent as ambassador to Russia.

**LEFLORE**, a N. W. county of Mississippi, formed since the census of 1870; area, about 700 sq. m. The Tallahatchie and Yallahusha rivers unite in the N. part to form the Yazoo, which bounds the county partly on the S. E. The surface is level and the soil very fertile. Capital, McNutt.

**LEFORT**, or **Le Fort**, **François**, a Russian general, of Swiss origin, born in Geneva in 1656, died in Moscow, March 12, 1699. He early became a cadet of the Swiss guards in the French service, entered the army of Holland in 1674, and soon after went to Russia, where he received a captain's commission from the czar Alexis, and fought against the Turks and Tartars. After the death of Feodor III. in 1682, and the joint accession of the half brothers Ivan and Peter, he espoused the interests of the latter, took an active part in the movement which raised him to supreme authority in 1689, by removing his sister Sophia from the court, and at once became his chief minister. Peter intrusted to him the reorganization of the army after the European model, and appointed him general admiral, in which capacity he vigorously seconded the czar's efforts for the creation of a navy. In celebration of the first success of the new army and navy in the taking of Azov in 1696, a magnificent triumphal entry was prepared for the troops, in which Lefort, borne on a chariot in the form of a marine shell, held the place of honor, the czar walking behind him. He aided in quelling the insurrection of the strelitzes, and died in consequence of wounds received on that occasion. Lefort also exercised great influence in ameliorating the laws of Russia, secured religious toleration for foreigners, and was either the originator or promoter of many of the grand improvements which distinguished the reign of Peter the Great.

**LEFUEL**, **Hector Martin**, a French architect, born in Versailles, Nov. 14, 1810. He studied in Paris and Rome, and in 1848 exhibited his famous designs for a monument in a Florentine palace. He was appointed architect of the palace of Meudon, and subsequently of Fontainebleau. Upon the death of Visconti in December, 1853, he modified the plans of the latter for the new Louvre, which he completed in 1857. He has executed many public edifices, among which is the palace of fine arts for the exposition of 1855. He was admitted to the institute in 1855, and is professor in the school of fine arts, and chief architect of the national palaces. He is regarded rather as an eclectic in architecture than as an original genius.

**LEGACY** (Lat. *legatum*, from *legare*, to bequeath), a gift of any personal property by



will. In Rome the general law determined uniformly who should succeed to the political, social, and personal rights of one who had died; but a member of the *populus* might get a special law passed by the *comitia curiata* authorizing an alteration of the usual rules for the distribution of property. A testament was, therefore, nothing else than a private law, and hence *legare*, from *lex*, came to be used as the appropriate word for making testamentary dispositions. The peculiar feature of the testament was the institution of an heir, that is, of a person who was to succeed to the *persona* of the testator. A legacy was an injunction to this heir to give or pay over to a third person a part of the inheritance. The word was never applied, as in the English law, to a direct bequest; and if there was no heir, the legacy necessarily failed. In our law, a legacy is a gift or bequest of goods or chattels by testament. As no testamentary disposition of such property can be administered without the interposition of a representative of the deceased, the court, if no executor was appointed by the will, or if he who was appointed declines to accept the trust, will itself assume the nomination of an administrator. In him all the personal property is vested, and it is his office to estimate the assets and pay the debts of the deceased, and to divide the surplus, if any, according to his will, or according to the general statutes of distribution. A legatee acquires indeed, under the testament itself, an inchoate right to the legacy; but this is perfected only by the assent of the executor, or other representative of the testator.—Legacies are said in law to be general, specific, or demonstrative. The two former of these must be nicely distinguished from each other, because, as we shall see further on, the one class is subject to abatement, and the other to ademption. A legacy is general when it does not bequeath a particular thing or part of the testator's personal estate by distinguishing it from all others of the same kind; thus, the gift of a horse or of a diamond ring, without indicating any particular horse or ring, is a general legacy. So bequests of money for a ring or to purchase government securities, or of an annuity to be purchased out of or charged to the personal estate, or of so much money to be paid in cash, have been construed to be general legacies. A legacy is specific when it refers by particular description to a certain chattel, and shows an intention that the legatee shall have the very thing, and not merely an equivalent value. For example, the gift of "my East India bonds," or "a sum of money now in the hands of A," or of "the money due on B's note," is a specific legacy. Demonstrative legacies partake in some respects of the qualities of both those just mentioned, and may be defined to be those which in their nature are general, but are to be satisfied, according to the will, out of a particular fund; thus, "1,000 dollars out of my bank stock." This kind of

legacy possesses the better qualities of both the others. It is so far general that it is not adeemed by mere change in the fund out of which it is to be satisfied, and so far specific that it does not abate with general legacies for the payment of debts. A specific legacy may be adeemed; that is, if the subject of it be not in existence at the time of the testator's death, then the bequest entirely fails. Thus, if a debt specifically bequeathed be received or discharged by the testator, it will be adeemed, for there remains nothing for the will to operate upon. But a specific gift is not adeemed by the testator's pledge of the subject of it, and the legatee will be entitled to have it redeemed by the executor, and, if the latter fails to do so, to receive compensation out of the general assets. A demonstrative legacy is not adeemed by a failure of the particular fund upon which it was charged. The value is the principal thing; the particular fund designated is only accessory and of secondary importance, and if it no longer exist, the bequest must be satisfied out of the general assets.—A legacy lapses if the legatee die before the testator, or, if after his death, yet before the contingency happened upon which the legacy was to vest. The general and well established rule of the common law is, that unless the legatee survive the testator, the legacy is extinguished. Statutes in many of our states have changed this rule, and extend the benefit of legacies to the lineal descendants or other heirs of legatees. The consequences of lapse may always be avoided by special provisions in the will. As to lapse by death of the legatee after the testator, it may be laid down as a general rule, that when a legacy is given without specifying any time for its payment, it is due on the death of the testator, although not payable until after one year. This year being intended only for the convenience and safety of the executor, it is not permitted to prevent the vesting of the legacy; and if the legatee die within the year, the bequest goes to his representatives. But if the testator have made any conditions of future payment, the courts examine into his intentions in order to determine whether the interest in the legacy be vested or contingent. In this respect, and concerning familiar cases, two very well settled rules are found in practice. First, if a legacy be "payable" or "to be paid" at any certain time, as "when the legatee arrives at the age of 21," it confers a vested interest immediately on the testator's death, and is transmissible to personal representatives. Secondly, if a gift of property be to the legatee "at 21" (and not merely payable at that age), or when, or if, any determinate thing shall happen, then the time becomes an essential element, and the legacy is contingent; if then the legatee die before the precedent condition be performed, the legacy lapses and fails entirely. With respect to the vesting of legacies charged upon real estate, the general rule seems to be that when the gift is immedi-

ate, but the payment postponed, it is contingent, and will fail if the legatee die before the time of payment arrives; but when the payment is postponed merely in regard to the convenience and circumstances of the person and estate charged with the legacy, and not on account of the age, condition, or circumstances of the legatee, it will be vested, and must be paid although the legatee should die before the time of payment.—Finally, legacies may be lost not only by ademption and lapse, but also by abatement. In the administration of the estate by the executor, legacies must be applied to the payment of debts, if other property is insufficient. General legacies are to be applied before specific, the whole if all be needed, or *pro rata* if the aggregate thus obtained will suffice. But general legacies given for any valuable consideration, as for the relinquishment of dower by the widow, or for a debt actually due, will receive consideration and indulgence before all others. The same remark is true when it is the declared or evident intention of the testator to prefer one legatee to another. Specific legacies suffer abatement only after complete exhaustion of general and residuary legacies. In England, those to whom specific and demonstrative legacies are given can compel the devisees of land not charged to contribute with them *pro rata* toward the payment of debts. This rule is not generally admitted in the United States, though general residuary devisees of land have been charged in the marshalling of assets for contribution to payment of debts before specific legatees.—On the testator's death the entire personal property vests in the executor, who holds it in trust for the payment of debts and other claims. No legacy can be received by the legatee without the assent of the personal representative, though if he withholds this improperly he may be compelled in a court of equity to give it. Probably, under the usual statutes in force in this country, this assent cannot be given until the receipt of letters testamentary from a probate court or other competent jurisdiction in the premises. Statutes generally make legacies payable a year from the time of issuing the letters of administration. If however the will directs the bequest to be paid earlier, the administrator must comply, and may take for his security a bond of indemnification in case of failure of assets. In general interest is not payable on legacies unless payment is delayed beyond a year, or unless given in satisfaction of a debt, or, in special cases, when ordered by the court. A legacy payable to an infant can only be paid to his guardian unless statutes make other provision, as they do in some states in case of small legacies. At common law a bequest to a married woman must be paid to the husband, but this is in many states changed by statutes.

**LEGARÉ, Hugh Swinton**, an American statesman, born in Charleston, S. C., Jan. 2, 1797, died in Boston, June 20, 1843. On the fa-

ther's side he was of French Huguenot stock; on the mother's Scottish. Inoculated with smallpox when a child, the disease fastened on his lower limbs, impaired their growth, and crippled for a time their development. Books were his only refuge from his physical infirmities. At the age of 14 he entered the South Carolina college, where he devoted himself mainly to classical literature and philosophy, and eagerly practised in the debating societies. To become an orator was the chief object of his ambition, and he made great acquisitions both in the classics and modern languages and literatures, though chiefly after leaving college. He graduated in 1814, studied law for three years, and in 1818 went to France. Thence he proceeded to Edinburgh, and entered the classes of civil law, natural philosophy, mathematics, and chemistry, but attended mainly to the civil law. He afterward visited London, made a tour through France, the Low Countries, and the Alps, and returned to Charleston after an absence of two years. He now undertook the care of his mother's cotton plantation on John's island, and was elected to the lower house of the general assembly for its biennial term from 1820 to 1822. In 1822 he removed to Charleston, and engaged for the first time in the practice of his profession. But the very reputation which he had already won as a man of letters was a barrier to his success as a practitioner, and he had the mortification of feeling that he made no progress in the profession to which he had dedicated his life. In 1824 he was chosen from the city a representative in the legislature, and thus continued till 1830, when he was elected attorney general. During the nullification excitement he ardently supported the cause of the Union in public speeches. Pending this conflict, the "Southern Review," a quarterly magazine, was established, ostensibly under the supervision of Stephen Elliott. Legaré was his coadjutor, and the writer upon whom he mostly relied. He wrote the initial article of the first number, on "Classical Literature," and continued to write in each successive number one, two, three, and sometimes more articles, on some of his favorite subjects. On certain occasions when the usual contributors failed, he furnished half the contents of the "Review." It was suspended after the eighth volume, Legaré having been the editor after the death of Elliott. Meanwhile Legaré ably maintained his position as attorney general. In 1832 he was appointed chargé d'affaires at Brussels, where he resumed his varied studies. In the autumn of 1836 he made a tour among the seats of learning in northern Germany, and then returned home. In his published remains, the "Diary of Brussels," &c., will afford some idea equally of his travels, studies, and experiences. Almost immediately after his arrival at Charleston he was elected to congress, taking his seat in the extra session of 1837, called to deliberate on the financial embarrass-

ments of the country. In the debates which followed he greatly increased his reputation. But his course in opposition to the sub-treasury project did not please his constituency, and he was defeated at the next election. He now addressed himself with more determined purpose than ever to his profession. He was soon employed in some cases of great magnitude, then pending in the courts of South Carolina. In the case of "Pell and Wife v. the Executors of Ball," he achieved a great triumph, at once of argument and eloquence, which was everywhere acknowledged. The reputation of a great lawyer could no longer be denied him. In the presidential canvass of 1840 he again took part in politics in favor of Gen. Harrison. About this time, also, he began a series of brilliant papers in the "New York Review" on "Demosthenes," "The Athenian Democracy," "The Origin, History, and Influence of the Roman Law," &c. While thus engaged he was appointed by President Tyler attorney general of the United States. This office gave him ample employment, and sufficiently tasked his vast legal resources, but always to the increase of his reputation. He gave important aid in the conduct of the Ashburton treaty, and the president confided to him the care of the state department when vacated by the withdrawal of Mr. Webster. Accompanying the president to Boston in June, 1843, in order to take part in the Bunker hill celebration of that year, he was seized so severely on the 16th with a visceral derangement that he was unable to join in the ceremonies of the next day. He was removed to the residence of his friend Mr. Ticknor, where he died. His remains, temporarily deposited in a vault at the Mt. Auburn cemetery, were in 1859 removed to Charleston, and interred at Magnolia cemetery, where a handsome monument has been raised to his memory. He was never married. A biography with selections from his writings, including reviews, orations, public despatches, and the "Diary of Brussels," was published at Charleston in 1846, in 2 vols. 8vo.—His sister, MARY SWINTON BULLEN, an artist, born in Charleston, S. C., about 1800, painted a "Spanish Pointer," nearly of life size, and the "Dogs of St. Bernard." In 1849 she emigrated to Lee co., Iowa, and established at West Point an institution called "Legaré college" for the liberal education of women, to the support of which she devoted herself for many years.

**LEGATE** (Lat. *legatus*, one sent with a charge), in ancient Rome, the title given to an ambassador, or to the lieutenant of the supreme civil and military magistrate; in ecclesiastical history, the title of the representative of the pope in the government of one of his temporal provinces, or in his intercourse with sovereigns or with national churches. The Roman senate alone appointed ambassadors, who were generally chosen from among persons of consular rank. Under the republic the dictator, consul, proconsul, and prætor chose their own *legati*

or lieutenants, subject to the approval of the senate. Under the empire, the *legati Cæsaris* were the lieutenants of the emperor in certain provinces the administration of which was reserved to himself.—The representatives of the bishop of Rome at imperial and royal courts, or in councils, or despatched for the settlement of some ecclesiastical difficulty, received the title of *legati* at a very early date. In the middle ages legates fell under a three-fold distinction: *legati à latere* or *de latere*, persons delegated "from the side" of the pontiff, who were generally cardinals; *legati missi* or *dati*, or *nuntii apostolici*, "apostolic nuncios;" and *legati nati*, or "legates born," a title formerly attached to certain ecclesiastical dignities. The archbishops of Canterbury, Toledo, Mentz, Lyons, and Arles claimed in mediæval times the honorary title of "legates born" of the holy see. This title has now fallen into abeyance. That of *legatè à latere* is bestowed on a cardinal sent by the pope on a special mission to a foreign court. This title was also formerly bestowed on the governors of the chief pontifical provinces, hence called legations, such as Ferrara; those not governed by cardinals being called delegations. At present the resident ambassadors or legates of the holy see near first-class powers are called nuncios, and those at second-rate courts have the title of internuncio. Legates *à latere* in mediæval times claimed in all cases, in the countries to which they were sent, the same power as the pope himself when present. This was limited by the council of Trent; and in modern custom legates claim power only for the special cases for which they are sent, and do not interfere with the ordinary jurisdiction of bishops.

**LEGENDRE, Adrien Marie**, a French mathematician, born in Toulouse in 1752, died near Paris, Jan. 10, 1833. He evinced an early taste for mathematics, and through the influence of D'Alembert was appointed in 1774 to a chair in the military school at Paris. In 1782 he gained prizes for two remarkable papers from the academies of science at Paris and Berlin. In 1783 he succeeded D'Alembert at the French academy, and in 1787 was appointed by the government, with Cassini and Méchain, to connect the observatories of Greenwich and Paris by a series of triangles. He presented in 1791 a report of their joint labors, with a description of a new instrument which he had invented and successfully used for measuring angles. In 1794 he published his *Éléments de géométrie*, upon which his reputation principally rests. It has been several times printed in English, the best translation being that of Sir David Brewster. The same year he published a *Mémoire sur les transcendentes elliptiques*. In 1798 appeared his *Essai sur les nombres*, reprinted with additions in 1830, under the title of *Théorie des nombres* (2 vols. 8vo), and in 1805 a *Nouvelle méthode pour déterminer l'orbite des comètes*. These were followed by his *Ex-*

*ercices de calcul intégral sur divers ordres de transcendentes et sur les quadratures* (3 vols. 4to, 1807-'19), in which he attempted to collect all that is most remarkable in the theory of transcendentials and integrals. This subject was enlarged and reduced to a more digested system in his *Traité des fonctions elliptiques et des intégrales eulériennes, avec des tables pour en faciliter le calcul numérique* (3 vols. 4to, 1827-'32). He was appointed in 1808 councillor of the university, and in 1816 examiner of candidates for the polytechnic school.

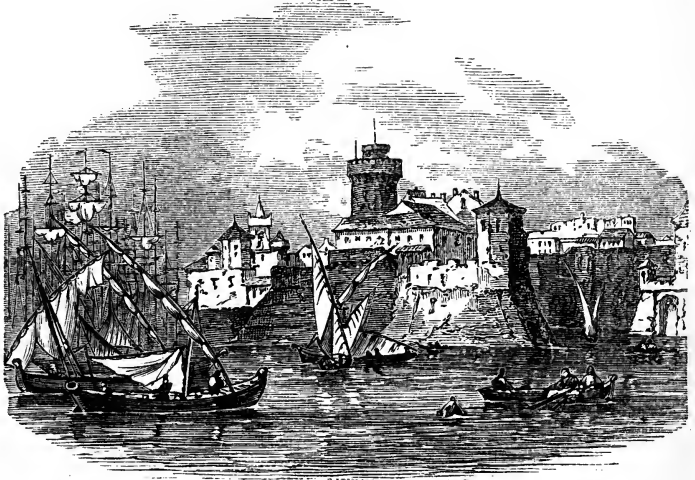
**LEGGETT, William**, an American author, born in New York in 1802, died May 29, 1839. He was educated at the college in Georgetown, D. C., and in 1819 accompanied his father to Illinois. In 1822 he entered the navy as midshipman, but resigned his warrant in 1826. He had in the previous year published a volume of poems, entitled "Leisure Hours at Sea, by a Midshipman of the U. S. Navy" (18mo, New York). In 1828 he became editor of the

"Critic," a weekly literary journal, which was soon united with the "New York Mirror." He subsequently collected in a volume some of his contributions to these and other publications, under the title of "Tales by a Country Schoolmaster," followed by one entitled "Sketches at Sea." In the summer of 1829 he became one of the editors of the New York "Evening Post," to which journal he was attached till January, 1836. At the outset he stipulated with his principal, Mr. William C. Bryant, that he should not be required to write

on political subjects, as he had no taste for or fixed opinions upon them; but before a year had passed he appeared to have found his true vocation in discussing them. In 1835 the meetings of the abolitionists in New York city were attacked and dispersed by mobs. Leggett denounced these proceedings, and defended the right of free discussion in regard to slavery as well as all other subjects. Having retired from the "Post," he commenced a weekly journal called the "Plaindealer," which attained a large circulation, but was discontinued in less than a year through the failure of its publisher; after which, his health being greatly enfeebled, he ceased literary labor, and lived in retirement at New Rochelle. In 1839 he was appointed by President Van Buren diplomatic agent to Guatemala, but died suddenly while preparing for his departure.

Soon after his death a collection of his "Political Writings," with a memoir, was published by Theodore Sedgwick (2 vols., New York, 1840). Mr. Leggett was remarkable among the journalists of his day as an unflinching advocate of freedom of opinion for his political opponents as well as for the men of his own party. Mr. Bryant, who has written a poem in his memory, describes him as a person fond of study, one delighting to trace principles to their remotest consequences, and greatly gifted with moral courage, having no fear of public opinion as regarded the expression of his own convictions.

**LEGHORN** (It. *Livorno*). **I.** A province of central Italy, in Tuscany, consisting of two districts, the city of Leghorn and the island of Elba; area, 126 sq. m.; pop. in 1872, 118,851. **II.** A city, capital of the province, on the W. coast, in lat. 43° 33' N., lon. 10° 18' E., 12 m. S. by W. of Pisa and 50 m. W. by S. of Florence; pop. in 1872, 97,096, including



The Port of Leghorn.

about 10,000 Jews, who are the richest class of the inhabitants; also Greeks and Armenians, Turks, Moors, Germans, English, &c. The town is of comparatively modern origin, and possesses few remarkable buildings or objects of art. The cathedral is interesting in consequence of the façade having been designed by Inigo Jones. There are seven other Catholic churches, and places of worship for members of the church of England, Scotch Presbyterians, Greeks, and Armenians. The Jews have a richly ornamented synagogue, and the Mohammedans a private mosque. The modern palazzo Lardarel, built by the count of that name, contains a gallery of pictures and statues. There is another palace, formerly the residence of the grand dukes of Tuscany. In the *piazza dei Due Principi*, a large new square, is a statue of the grand duke Ferdi-

nand III., and near the quay is one dedicated to Ferdinand I. There are two *monti di pietà* (public pawn offices), a free library, an observatory, and a citadel. The English cemetery contains the tombs of Smollett and Francis Horner. The monastery of Monte Nero is upon a hill near the town. The three lazarettos of San Rocco, San Jacopo, and San Leopoldo, the first for those who arrive with a clean bill of health (*patente netta*), the second for those with a doubtful (*patente tocca*), and the third for those with a foul bill (*patente brutta*), are well managed establishments. The town possesses a lyceum, a gymnasium, a nautical and a technical school, a scientific academy with a library of 20,000 volumes, and various other educational, scientific, and charitable institutions. It is the seat of a bishop (since 1806), and of a prefect and other provincial authorities. Many of the private houses are elegant, and the vicinity is covered with villas of the wealthy citizens. The town has been greatly enlarged of late years by throwing down many of the old fortifications and including two large suburbs within the walls. It resembles an English town more than any other in Italy, and its commercial and manufacturing importance is constantly increasing. As a Mediterranean seaport it ranks after Marseilles, Genoa, Trieste, and Smyrna. The accommodation for shipping having become insufficient for large vessels, which were obliged to discharge their cargoes in the roads, the government undertook the enlargement of the port. The work is now completed, and ships of large tonnage can enter and remain in safety. There is also a fine dry dock capable of accommodating vessels of the largest size. Being a free port, Leghorn is perhaps better supplied with French and English manufactures than any other town on the continent. The general imports for the year ending September, 1872, were valued at \$14,800,000, the exports at \$15,400,000; the imports from the United States at \$1,180,000, the exports to the United States at \$1,592,000. The number of vessels entered during the same year was 6,401 (American 29), tonnage, 1,079,455; of vessels cleared, 6,232 (American 7), tonnage 1,048,237. The vessels built in Leghorn are mostly for the coasting trade. The chief manufactures are corals, silk, wool, cotton, straw and felt hats, alabaster, porcelain, pottery, leather, and tobacco. There are salt works and many dyeing establishments, and admirably organized distilleries of oil and *rosoglio* (a kind of liqueur). There were in 1873 22 foreign consuls resident here, and the great concourse of sailors and strangers of all nations imparts to the town a very interesting and animated appearance. The natural insalubrity of the site has been remedied by effective draining. Good water is brought to the town by means of a fine aqueduct, which was erected in 1792. In the summer season Leghorn is a favorite resort of the fashionable world

of Florence, Rome, Bologna, Siena, and other cities, the influx of visitors frequently amounting to 20,000.—Leghorn is first mentioned as a village in the 11th century, but became important only after the destruction of the port of Pisa, and particularly in the 15th and 16th centuries under the rule of the Medici. The grand duke Cosmo I. made it a free port and granted many privileges to the town, which continued to improve under his successor Ferdinand I. In 1808 Napoleon annexed it to his empire, and it became the capital of the French department of the Mediterranean. It was taken by the Austrians under Gen. Aspre in 1849, and for a long time subsequently was occupied by an Austrian garrison. In March, 1860, it was annexed with the whole of Tuscany to the dominions of Victor Emanuel.

**LEGNAGO**, a fortified town of Italy, in the province of Verona, on the Adige, 50 m. from its mouth, 26 m. E. of Mantua, and 22 m. S. E. of Verona; pop. about 10,000. It forms with Verona, Peschiera, and Mantua the famous quadrilateral of fortresses, of which it is the S. E. angle, and is the least important. The town is on both banks of the river, which is here crossed by a wooden bridge. It contains a gymnasium, a theatre, and a hospital, has manufactories of hats and fine leather, and is an important depot for agricultural produce, especially rice, which is extensively cultivated in the surrounding district. The original fortifications were largely the work of San Micheli. The French were defeated here in 1701, but captured the place on Sept. 13, 1796, and demolished the works, which the Austrians afterwards rebuilt. A canal connects the Po at Ostiglia with the Adige at Legnago.

**LEGNANO**, a town of Italy, in the province and 16 m. N. W. of the city of Milan, on the river Olona; pop. about 6,500. It is on both sides of the river, which is crossed by two stone bridges, contains three churches and a hospital, and has manufactories of silk and cotton fabrics and dye works. The emperor Frederick Barbarossa was defeated here by the Milanese, May 29, 1176.

**LEGOUVÉ**. **I. Gabriel Marie Jean Baptiste**, a French poet, born in Paris, June 23, 1764, died there, Aug. 30, 1812. He inherited a large fortune from his father, the advocate Jean Baptiste Legouvé. In 1792 he produced *La mort d'Abel*, a tragedy of some merit, which was sharply criticised by La Harpe. His *Épicharis et Néron* (1793), in which the tyrant represented Robespierre, gained great success from the acting of Talma. Among his other works are *Le mérite des femmes*, a didactic poem (1800), and *La mort de Henri IV.*, a tragedy (1806). He was made a member of the institute and adjunct professor of Latin poetry. He became deranged in 1810, in consequence of the death of his wife and other misfortunes, and died in a private asylum. There is a complete edition of his works, by Bouilly and Malo (3 vols., Paris, 1826). **II. Ernest Wilfrid**, a French



dramatist, son of the preceding, born in Paris, Feb. 14, 1807. At an early age he wrote novels, plays, and poems, and his lectures on *L'Histoire morale des femmes* were published in 1848. In 1849, in conjunction with Scribe, he produced *Adrienne Lecouvreur*, which gained great popularity through the personation of the heroine by Rachel. She, however, paid a fine of 5,000 francs rather than perform in his *Médée*, a play which in Montanelli's Italian version was in 1856 very successful with Ristori. In 1856 he succeeded Ancelot as a member of the academy. Among his works are *Béatrix* (1861), *La croix d'honneur et les comédiens* (1863), *Miss Suzanne* (1867), and *Messieurs les enfants* (1868).

**LEGRAND DU SAULLE, Henri**, a French physician, born in Dijon in 1830. He was one of the writers of the *Gazette des Hôpitaux* (1854-'61), and of other medical journals, and became in 1867 physician at the Bicêtre. He is a high authority on the treatment of the insane, and his *Folie devant les tribunaux* (Paris, 1864) obtained an academical prize. Among his numerous other writings is *Le délire des persécutions* (1871), suggested by the warfare against the followers of the commune.

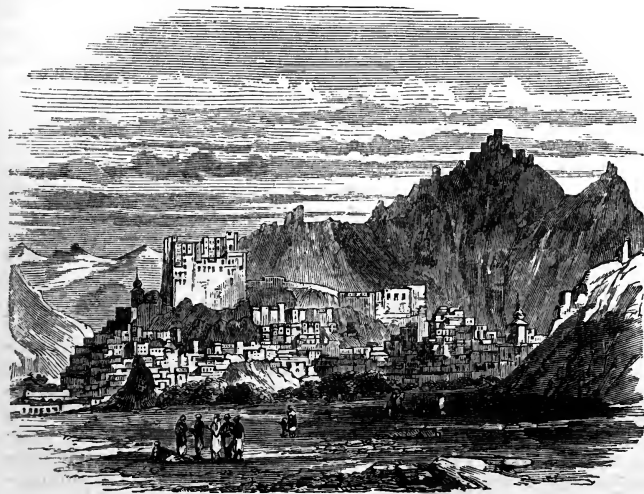
**LEH**, or **Le**, a city of Cashmere, India, capital of the province of Ladakh, situated in the upper part of an open valley of the Himalaya, 3 m. N. of the Indus and 11,500 ft. above the sea, about 150 m. E. of Serinagar or Cashmere; lat. 34° 8' 5" N., lon. 77° 40' 36" E.; pop. variously estimated from 5,000 to 12,000. It covers the slope and surrounds the base of a low spur on the E. side of the valley, the middle and W. side of which are occupied

with flat roofs. One of the most striking buildings is the rajah's palace, a huge pile of masonry upon a high rocky pinnacle in the centre of the town. There are also several picturesque temples. Outside of the walls, in a valley surrounded by hills, is a large cemetery containing many groups of monumental buildings, far exceeding in number the houses of the living. Leh is an important commercial centre, it being the place of rendezvous for merchants travelling to and from Yarkand, and the principal market for the sale of the shawl wool of East Turkistan. In the summer, when the caravans from central Asia and India meet there, its population is greatly increased. The town is called Ladak by Capt. Knight in his "Diary of a Pedestrian in Cashmere and Thibet" (London, 1863).

**LEHIGH**, a river of Pennsylvania, rising near Wilkesbarre, Luzerne co., in the N. E. part of the state, and uniting with the Delaware at Easton after a S. S. E. course of about 90 m. In its upper course it is a rapid and picturesque mountain stream, broken by several falls. It passes through a rich coal region, for the products of which it serves as an outlet. It breaks through the Blue Ridge 12 m. below Mauch Chunk, to which place, the terminus of the slackwater navigation, it is navigable by canal boats.

**LEHIGH**, an E. county of Pennsylvania, bounded N. W. by the Kittatinny or Blue mountains, and S. E. by South mountain, and drained by Lehigh river; area, 389 sq. m.; pop. in 1870, 56,796. It abounds in iron ore, limestone, and clay slate, and has an undulating surface and a fertile soil.

The railroads passing through it are the Lehigh Valley, the East Pennsylvania, the Catasauqua and Fogelsville, and the North Pennsylvania. The chief productions in 1870 were 361,209 bushels of wheat, 162,147 of rye, 549,480 of Indian corn, 530,632 of oats, 279,718 of potatoes, 915,818 lbs. of butter, and 38,726 tons of hay. There were 7,816 horses, 11,591 milch cows, 6,847 other cattle, 3,123 sheep, and 17,505 swine; 13 manufactories of agricultural implements, 23 of brick, 35 of carriages, 2 of cars, 1 of refined petroleum, 24 of iron, 10 of lime, 10 of machinery, 13 of roofing materials, 24 of saddlery and harness, 5 of



The Rajah's Palace, Leh.

by extensive cultivated tracts, the fields rising in terraces one above another. It is surrounded by a wall defended at intervals by towers. The streets are irregular and intricate. The houses are mostly of stone or of unbaked brick,

sash, doors, and blinds, 19 of tin, copper, and sheet-iron ware, 34 of chewing and smoking tobacco, 2 of woollen goods, 6 breweries, 24 tanneries, 25 currying establishments, 7 saw mills, and 21 flour mills. Capital, Allentown.

**LEHMANN, Charles Ernest Rodolphe Henri**, a French painter, of German origin, born in Kiel, Holstein, April 14, 1814. He studied under his father and under Ingres in Paris. He exhibited a religious picture in 1835, followed by many other works, among which are portraits and mural paintings for the hôtel de ville and other public buildings. His pictures are valued for their fine coloring and expression. In 1864 he became a member of the academy of fine arts.—His brother РОДОЛФЕ (born in 1819), who resides in Rome, excels in Italian genre pictures and landscapes.

**LEIBNITZ**, or **Leibniz**, **Gottfried Wilhelm**, a German philosopher, born in Leipsic at the beginning of July, 1646, died in Hanover, Nov. 14, 1716. His father, a professor in the university, died when he was six years old. He enjoyed by the care of his mother the best privileges of education which Germany then afforded, but declares that he was for the most part self-taught, and relates that he would withdraw from school to shut himself up whole days in his father's library. At the St. Nicholas gymnasium in Leipsic he incurred the remonstrances of his masters by learning Latin and reading the classics in advance of the regular course. Before he was 12, he says, he "understood the Latin authors very well, had begun to lisp Greek, and wrote verses with singular success." He was already studying the greatest modern as well as ancient philosophers, was comparing Bacon and Descartes with Aristotle and Plato, and was aiming to grasp the unity of all the sciences. At the age of 15 he entered the university of Leipsic, applied himself chiefly to mathematics, philosophy, and law, continued his studies for a short time at Jena, returned to Leipsic, and produced remarkable theses on occasion of receiving his degrees. His treatise *De Principio Individui*, his academic exercise on becoming bachelor of philosophy, is perhaps the most extraordinary demonstration of erudition and power of thought ever achieved by a youth of 17. It was the fruit of severe boyish deliberation whether or not he should give up the substantial forms of the schoolmen, prefigured his future philosophy by its vivid statement of individuality as the fundamental principle of ontology, and was the last noticeable work written in the sense and style of scholasticism. In it he declares for nominalism. His three theses on becoming bachelor and licentiate of law were published, and he wished to crown his studies in jurisprudence with the degree of doctor; but this was refused him on pretence of his youth by the superiors of the college, whose ill will he had in some way incurred. He therefore left his native city, never to return. At the university of Altdorf he maintained his thesis for the doctorate in 1666 with so brilliant success that a professorship was immediately offered him, which he declined. He fell in with a society of Rosicrucians and alchemists at Nuremberg, became their secre-

tary, recorded their experiments, and explored the hermetic authors for revelations concerning the philosopher's stone, but was soon ready for more hopeful labors. In 1667 he met the baron of Boyneburg, ex-chancellor of the elector of Mentz, who was captivated by his genius, and invited him to Frankfort, where he immediately composed his *Nova Methodus Discendæ Docendæque Jurisprudentiæ* (1668), in which he shows his admiration of the Roman law and proposes the registry of all its enactments in chronological order. In the following year appeared his *Corporis Juris Reconcinnandi Ratio*, in which the arrangement of Justinian is disapproved, and all law is reduced to nine heads: general principles of rights and actions, rights of persons, judgments, real rights, contracts, successions, crimes, public rights, and sacred rights. In the treatment of these departments he proposes to retain the texts of the *Corpus Juris Civilis*, but to follow the method of the Pandects rather than of the Institutes. The versatile genius and various pursuits of Leibnitz soon withdrew him from the science of philosophical jurisprudence. "He did but pass over that kingdom," says Lermnier, "and he reformed and enlarged it." In 1669 he produced, at the instance of Boyneburg, an anonymous treatise in favor of the claims of the prince of Neuburg to the vacant throne of Poland, in reward for which he was made councillor of the elector of Mentz. This office, which he retained three years, furnished him leisure to prosecute vast studies in politics, physics, and philosophy. He extended his fame as a philosopher by republishing and annotating the *Antibarbarus Philosophus* of Nizolius (1670), in which he ranks Aristotle above Descartes; wrote a theological argument in defence of the Trinity, *Sacrosancta Trinitas* (1671), aimed against the Polish Socinian Wisnowatius, who had procured the erection of a temple to the harmony of the three Christian confessions; addressed to the academy of sciences of Paris and to the royal society of London two remarkable memoirs on the laws of motion; and entered into correspondence with Spinoza by sending him an account of the progress of optics. One of his projects at this time was for a reunion of the Lutheran and Roman Catholic churches, concerning which he had a long correspondence with Bossuet. In 1672 he was sent by Boyneburg to accompany his son to Paris, then the residence of the most learned men of the age under the patronage of Louis XIV. Associated with Cassini, Huygens, and others, he devoted himself especially to mathematics and physics, and established a European reputation by bold and striking thoughts in all departments of learning. To Colbert he presented a new arithmetical machine, an improvement on that of Pascal, which was favorably noticed by the academy of sciences. To the king he addressed a memorial for an expedition to Egypt, an eminent instance of political foresight. "The con-

quest of Egypt," he says, "will give supremacy on the sea, the commerce with India, predominance in Christendom, and even an empire in the Orient on the ruins of the Ottoman power." Another of his suggestions to Louis XIV. was for the publication of a general repertory of human knowledge in the form of a dictionary, thus presenting all the results of scientific labor in their mutual dependences. He proposed illustrated treatises on natural history, and states that his own preference would have been to study the laws established by God in nature rather than the laws and customs created by men for themselves. Several members of the academy of sciences suggested to him that he would be admitted to that body as a pensioner, provided he would become a Catholic; but he declined to accept the offer under this condition. In 1673 he visited England, became personally acquainted with Newton, Boyle, Oldenburg, Wallis, and Collins, and was elected a member of the royal society. On his return to Paris in the same year he received instructions in the higher mechanics and analysis from Huygens, to whom, in a letter to the countess Kielmancegge, he acknowledges himself indebted in his mathematical studies which resulted in the discovery of the differential calculus. The death of Boyneburg, soon followed by that of the elector of Mentz (1674), left him without a patron, and he determined to return to Germany. At Paris he received from the duke of Brunswick-Lüneburg an appointment as councillor, with a pension and with permission to prolong his absence at pleasure. He remained in France till 1676, again visited London, passed through Holland, met with Spinoza at the Hague, and on his arrival in Hanover, the residence of the duke of Brunswick, became his librarian, and was partially occupied for six years in arranging and enriching his library. At the congress of Nimeguen (1677) there was a dispute about the right of precedence between the princes who were electors and those who were not. Leibnitz maintained the cause of the latter in a treatise containing the ultramontane rather than Protestant declaration that all the states of Christendom should form but a single body, having the pope for their spiritual and the emperor for their temporal head. This idea of a grand theocracy appears prominently in several of his writings, alike in his views of society and of nature. Theology he defined as the jurisprudence of the kingdom of God, as law and politics transferred to a higher and absolute sphere. He was one of the founders in 1682 of the *Acta Eruditorum* of Leipsic, to which he furnished numerous articles. Employed to write the history of the house of Brunswick, he explored the principal libraries and archives of Germany and Italy for materials, returning to Hanover in 1690. The fruits of his researches were the *Codex Juris Gentium Diplomaticus* (2 vols., 1693-1700), a collection of treaties and public documents, with

a preface which is one of his masterpieces; *Accessiones Historicae* (2 vols., 1698-1700); *Scriptores Rerum Brunsvicensium Illustrationi Inservientes* (3 vols., 1707-'11); and the *Annales Imperii Occidentis Brunsvicensis* (first published by Pertz, 2 vols., 1843-'5). His *Protogaea* (first published entire in 1749), a dissertation on the state of the globe before the creation of man, was intended as an introduction to the last work, and was the first important contribution to the science of geology, which he called natural geography. His hypothesis supposes the prominence of fire in the formation of the earth, the gradual congelation after igneous fusion, the introduction of a vast body of water to cover the surface, and the origin of mountains and valleys by the subsidence of certain portions of the earth breaking in upon vast vaulted caverns. To his influence was chiefly due the foundation of the academy of sciences at Berlin, of which he became the first president in 1702. The first memoir which he presented to the academy was on a binary system of arithmetic, in which the base of the scale of numeration was the number 2 instead of 10, and the only figures used were 1 and 0. He soon after attempted to form a universal alphabet, the elements of which were to be very simple, like algebraic signs, instead of syllables and words, and were directly to represent ideas. This favorite but futile scheme was the subject of long continued meditations. To Augustus, king of Poland and elector of Saxony, he addressed a series of precepts for the advancement of sciences, with a curious preamble; and to this period belong his most important philosophical labors. In 1704 he composed his examination of Locke, *Nouveaux essais sur l'entendement humain*; he revealed the great variety of his learning in the first volume of the *Miscellanea Berolinensia* (1710); was a frequent contributor to the *Journal de Trévoux* and the *Journal des Savants*; and published in 1710 in French his *Théodicée*, the noblest monument of his genius, in which he grapples with the leading problems of philosophy and faith, and which is hardly surpassed as an example at once of metaphysical power and universal erudition. During the latter years of his life he enjoyed the highest personal distinction. A councillor and official historiographer at Hanover, a baron and aulic councillor with a pension at Vienna, he was consulted by Peter the Great at Torgau in 1711, and rewarded by him with the title of councillor of state and a pension of 1,000 rubles. He had for many years corresponded with the most illustrious persons in Europe on almost all public and scientific questions. He united the leading thinkers of Christendom by an interchange of ideas, and from his time the history of philosophy involves more than in any former period the general history of the human mind. To no single person is the civilized world more indebted for the literary commerce between all its parts. To Spinoza he wrote,

suggesting new methods of manufacturing lenses; to Magliabecchi at Florence, urging him in elegant Latin verses to publish his bibliographical discoveries; to the elector of Saxony, on the culture of the silkworm; to Grimaldi, the Jesuit missionary in China, to impart his researches in Chinese philosophy, and to prevail on the emperor to introduce his new binary arithmetic, suggesting that the latter may be a key to the book *Ye-kim*, supposed to contain the mysteries of Fo; to Bossuet and Mme. Brinon concerning the union of the Protestant and Catholic churches, and to Spanheim on the union of the Lutheran and Reformed; to Père des Bosses on transubstantiation, and to Dr. Samuel Clarke on time and space; to Remond de Montmort on Plato, and to Francke on popular education; to the queen of Prussia, his pupil, on free will and predestination; to the electress Sophia, her mother, on English politics; and to the cabinet of Peter the Great on the Slavic and oriental languages. A controversy with Newton concerning the discovery of the differential calculus embittered the latter years of his life. There is little doubt that Newton's method of fluxions and Leibnitz's method of infinitesimals were both independent and original discoveries; but the priority of publication belongs to Leibnitz, who gave a summary of the principles of the differential calculus in the *Acta Eruditorum* in 1684. Sir David Brewster's account of this matter, in his "Life of Newton," is, according to the German authorities Gerhart and Guhrauer, very incomplete, ignoring some important documents, particularly a letter of Leibnitz to Oldenburg dated Aug. 27, 1676. The royal society of London appointed a commission to examine the question, whose report, *Commercium Epistolicum* (1712), was in favor of Newton. This is admitted not to have been impartial, and its deficiencies are shown in a revised edition by Biot and Lefort (1856).—The principal metaphysical speculations of Leibnitz are contained in his *Théodicée, Nouveaux essais, Système nouveau de la nature* (1695), *De Ipsa Natura* (1698), the fragment on *Monadologie* (1714), and in portions of his correspondence. He was too much occupied with all the learning of Europe to give a complete and systematic development of his opinions either in this or any other department. His mind was nurtured in the controversy between the principles of Descartes and Locke, the ultimate tendencies of each of which he was able to perceive, and between which he wished to establish a position. He controverted Locke's rejection of innate ideas, by maintaining that, though no ideas be innate, there is yet an innate faculty for forming ideas independent of and superior to sensation. To the old axiom of sensualism, *Nihil est in intellectu, quod non fuerit prius in sensu*, he made the revolutionary addition, *nisi ipse intellectus*. The mind he compares not to a *tabula rasa*, a blank tablet, but to a block of marble that has

certain characteristic veins in it; affirms it to contain potentially in itself the general notions of things, which are unfolded as occasions invite, the germs of our ideas and of the eternal truths which are derived from them. Those necessary truths, which take their origin not from experience, but primarily from the thinking soul, are the elements of all knowledge. Thus, unlike that of Locke, the starting point of his philosophy is not the products of sensation, but the laws of the understanding; and he creates not a system of empiricism, but a system of rationalism. He departs almost equally from the results of Cartesianism as developed by Malebranche and Spinoza. In Descartes the prominence of the idea of the infinite or absolute tends to cast finite nature into the shade. This tendency appears more decidedly in Malebranche, who denied second causes, and limited all real agency to the Supreme Being, and in Spinoza, who affirmed all thought and substance to be alike parts and modifications of the one sole Existence. Thus the idea of cause was banished from the universe of created things, and all phenomena were regarded only as modes of the divine action. To avoid this result, to vindicate the notion of causality, was the object which Leibnitz had in view in declaring all matter to be necessarily active. He affirmed that one body cannot receive the power of acting from any other, but that the whole force is preëxistent in itself. He thus substituted in the study of nature the notion of force for that of mode, the form of dynamics for the form of abstract geometry. This principle is the key to his peculiar system. He begins with maintaining that the pure *à priori* conceptions of the reason are full and adequate expressions of objective realities. Logical truth is equivalent to actual truth; rational possibility is necessarily reality; ideas are identical with things. He introduces the two test principles of contradiction and sufficient reason, the former applying to the realm of necessary ideas, the latter to that of contingent facts. Whatever abstract conception involves no contradiction with the reason itself is absolutely true. But to determine what ideas are valid in any world of contingent phenomena, in any particular circumstances, there is needed the second principle. For every actual truth a sufficient reason must be rendered, showing that it is that which is best adapted to bring about the intended result. Thus everything must be judged by its final cause. The Cartesian doctrine, that substance consists essentially in extension, does not explain the constant movements and developments of nature. Unless, therefore, every phenomenon be regarded as a direct product of the divine mind, Leibnitz maintains that some inherent, causative, initiative power must be attributed to matter. This power cannot reside in masses as such, since they are infinitely divisible, and may therefore be reduced to a zero of ex-

tension, till they lose every material property. Hence his doctrine of monads, as the simple active elements of things, the veritable, living atoms of nature, the immaterial, indivisible, and final forces of the universe, uninfluenced from without, but continually changing by an inward principle. All monads contain an inward energy by virtue of which they develop themselves spontaneously; they are all different from each other, each having peculiar attributes; all are, properly speaking, souls, being endowed with perception, though those which compose material objects do not possess apperception or consciousness; all are independent of each other, each having its own means of development, and forming a microcosm or living image of the whole universe. In every monad might be read the world's history from beginning to end, each of them being a kind of deity (*parvus in suo genere deus*). God is the absolute, original monad, from which all the rest are generated; the primitive and necessary substance, in which the detail of changes exists emanantly. Hence follows another doctrine of Leibnitz's philosophy, that of preëstablished harmony. The dualism of Descartes is rendered unnecessary by the reduction of mind and matter to the same essence, the former being represented by conscious and the latter by unconscious monads. But these two classes of monads are wholly unlike, and exert no influence on each other. To explain their relation, therefore, Leibnitz reverts to the original constitution of things as perfected by God himself, who, he maintains, has so harmonized all the monads of which the universe is composed, that they work in complete unison in order to accomplish the end for which they were intended. This harmony is not only pre-established by a divine decree, but is produced by virtue of the very nature of monads. In one view every volition of a rational agent finds in the constant procession of physical forces a concurrent event by which it is executed; and in another view, the monads of the human system and of the outward universe are so accommodated to each other, each being a representative of all the rest and a mirror of all things, that each feels all that passes in every other, and all conspire together in every act, more or less effectively in proportion to their nearness to the prime agent. Hence the harmony between all the parts of matter, between the future and the past, between divine decrees and human actions, between the reign of efficient and that of final causes. The transition from these principles to Leibnitz's doctrine of optimism is easy. Evil is a necessary condition of finite being. The existing universe is one of innumerable possible universes, each of which would have had a different measure of good and evil. The present was made actual, because it presented to the Divine Intelligence the smallest degree of the latter and the largest of the former. Metaphysical evil consists simply in limitation, and

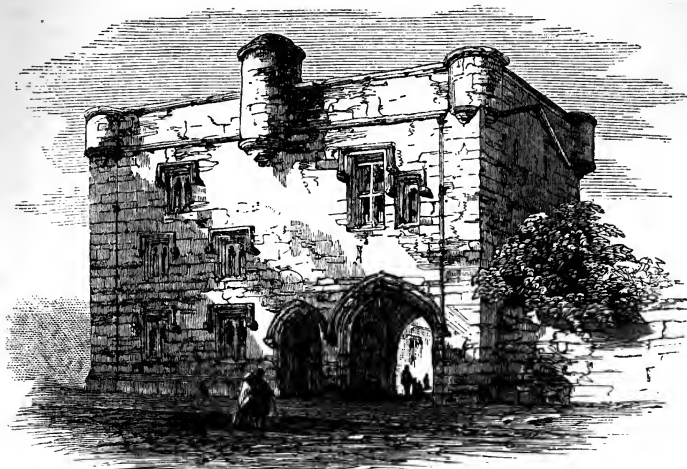
moral evil is permitted only for the sake of a greater ultimate good. It follows that he maintained the doctrine of philosophical necessity as the only kind of liberty consistent with the preëstablished order of the universe. The want of a logical and connected statement of the philosophy of Leibnitz was supplied by his disciple Wolf.—Leibnitz was of medium stature, of a spare but vigorous frame, was accustomed to eat much and drink little, regulated his meals by his pursuits and not by time, usually studied far into the night, sometimes sat by his desk almost without rising for months, sleeping in his chair, liked to converse with all sorts of people, and was never married. He wrote very little in his native language, his important treatises being either in Latin or French. His philosophical works were edited by Erdmann (Berlin, 1840). The collective edition by Pertz comprises altogether 12 volumes (Hanover, 1843-'62), consisting of *Geschichte*, prepared by Pertz himself (4 vols., 1843-'7); *Philosophie*, by Grotefend (1 vol., 1846); and *Mathematik*, by Gerhardt (7 vols., 1849-'62). See also Foucher de Careil's *Œuvres de Leibnitz*, from original documents, with annotations (6 vols., Paris, 1859-'65 *et seq.*), and the complete edition by Onno Klopp (6 vols., Hanover, 1864-'72 *et seq.*). The best biography is by Guhrauer (2 vols., Breslau, 1842; with additions, 1846). This is the basis of the "Life of Leibnitz," by J. M. Mackie (Boston, 1845).—Compare Schelling, *Leibnitz als Denker*; Hartenstein, *De Materia apud Leibnitz Notitione*; Helferich, *Spinoza und Leibnitz, oder das Wesen des Idealismus und Realismus*; Feuerbach, *Darstellung, Entwicklung und Kritik der Leibnitz'schen Philosophie* (Ansbach, 1837); Zimmermann, *Leibnitz und Herbart* (Vienna, 1849), and *Das Rechtsprinzip bei Leibnitz* (1852); Kvet, *Leibnitz's Logik* (Prague, 1857); the writings relating to his works by Bonifas (Paris, 1863), Thilo (Berlin, 1864), Summer (Göttingen, 1866), and Jacoby (Berlin, 1867); Durdik's *Leibnitz und Newton* (Halle, 1869); and *Leibnitz'sche Gedanken in der Naturwissenschaft*, by Du Bois-Reymond (Berlin, 1871).

**LEICESTER** (anc. *Rato*), a manufacturing town of England, capital of Leicestershire, situated near the centre of the county, on the right bank of the Soar, which is here crossed by three ancient bridges and a handsome modern one, 87 m. N. N. W. of London; pop. in 1871, 95,220. It has a Latin school, an insane asylum, an orphan house, a school of design, a philosophical society, a mechanics' hall, a museum with Roman antiquities, a theatre, a public library, and 54 places of worship, of which 11 belong to the established church. The staple manufacture is cotton and worsted hosiery. It is the centre of a great agricultural and wool-raising district, and fairs are held for horses, cattle, and sheep 12 times a year. Under the Romans as well as under the Saxons Leicester



was a place of importance; and numerous vestiges of those ancient times are still in existence. In 1851 tessellated pavements and other Roman remains were discovered. The name

**LEICHHARDT, Ludwig**, a German explorer, born at Trebatsch, Prussia, Oct. 23, 1813, died in Australia in 1848. He travelled from Göttingen and Berlin, being aided by William Nicholson, a physician of Bristol, whom he accompanied to France, Italy, and England, and who also enabled him to go to Australia in 1841. From Sydney he made several excursions into the interior, gathering much valuable information. A subscription amounting to £125 having been raised to fit out an exploring expedition under his charge, he left Moreton bay, on the E. coast, in August, 1844, with seven companions, crossed what is now the colony of Queensland and the S. part of York peninsula, rounded the gulf of Carpentaria, and reached the settlement



Magazine and Newark Gate, Leicester.

Leicester is derived from the river Leire (now Soar). Leicester had formerly a mint in which were produced a succession of coins from the time of the Saxon Athelstan to Henry II.

**LEICESTER, Earl of.** See DUDLEY, ROBERT.

**LEICESTER OF HOLKHAM.** See COKE, THOMAS WILLIAM.

**LEICESTERSHIRE**, a central county of England, bordering on the counties of Nottingham, Lincoln, Rutland, Northampton, Warwick, Stafford, and Derby; area, 797 sq. m.; pop. in 1871, 269,811. The surface consists almost entirely of gently rising hills, but nowhere presents any bold features. It is chiefly included in the basin of the Trent, the principal tributary of which in Leicestershire is the Soar (anc. *Leire*). The Avon, a tributary of the Severn, forms the S. boundary for nearly 8 m.; and the Welland, which falls into the Wash, for about 17 m., separating Leicester from Northamptonshire. The E. portion of the county belongs to the lias formation, and the W. to the sandstone. Coal exists to a considerable extent in the west. Limestone, gypsum, slate, whetstones, and clay are also found. The climate is mild and genial. The soil is loamy, and varies in fertility. The best soils are generally kept in pasture, for which the county is preëminent. The principal crop is barley; but wheat, oats, and beans are extensively cultivated. Leicestershire has long been famous as a hunting county, Melton-Mowbray being the headquarters of the sportsmen. The chief towns are Leicester (the county town), Ashby-de-la-Zouch, Bosworth, Market-Harborough, Lutterworth, Melton-Mowbray, Mount Sorrel, Whitwick, and Castle Donnington.

of Victoria Dec. 17, 1845, whence he returned by water to Sydney, arriving March 29, 1846. In October he again set out, hoping to find a direct passage across Australia to the N. coast; but he was repeatedly baffled, and was unable to carry out his project until December, 1847. His last letter was dated at Fitzroy Downs, W. of Moreton bay, April 8, 1848. Reports of his having been killed were received in 1850, and were confirmed in 1852 by the searching expedition of Hovenden Hely. In 1862 Conn and Giles discovered graves which were supposed to be those of Leichhardt and his companions; but new expeditions under MacIntyre in 1865 and Forrest in 1869 failed to throw light upon the fate of the explorer. In 1872 the authorities of Sydney sent out Andrew Hume, who affirmed that in 1862 he had met with Classen, the brother-in-law of Leichhardt, and his second in command, at a native settlement near the head of Sturt's creek. Hume returned to Sydney in February, 1874, and reported that he had again met Classen with the same natives, who had in the mean time removed to the head waters of Fitzroy river. According to Hume's report of Classen's statement, Leichhardt's men mutinied at the head of Victoria river, and were afterward killed by the natives; Leichhardt dying from want five days after the mutiny, and being buried in a hollow tree, according to the custom of the natives, and the life of Classen being spared on account of his skill in medicine. Hume professed to have in his possession the watch and quadrant of Leichhardt, a portion of his diary, and a written statement drawn up by Classen. He also discovered a letter written by Leichhardt at

Darling Downs, in February, 1848, in which he expressed great delight at receiving medals from the London and Paris geographical societies, and said that he was about to explore Victoria river. Leichhardt wrote "Journal of an Overland Expedition in Australia, from Moreton Bay to Port Essington" (London, 1847; German translation by Zuchold, Halle, 1851), and *Beiträge zur Geologie von Australien* (Halle, 1855). His biography has been written by Zuchold (Leipsic, 1856).

**LEIDY, Joseph**, an American naturalist, born in Philadelphia, Sept. 9, 1823. In 1844 he graduated M. D. at the university of Pennsylvania, and began the practice of medicine; but he soon devoted himself to teaching, and to original work in the biological sciences. In 1846 he was chosen chairman of the curators of the national academy of sciences, and in 1853 professor of anatomy in the university of Pennsylvania, which chair he still fills (1874). In March, 1871, he was appointed professor of natural history in Swarthmore college, teaching zoölogy, comparative anatomy and physiology, mineralogy, and geology, without intermitting his duties in the university. During the civil war his scientific labors were to a great extent arrested by his services as acting assistant surgeon in Satterlee hospital, Philadelphia. His contributions to scientific periodicals number nearly 800. He has also written "Flora and Fauna within Living Animals," "Ancient Fauna of Nebraska," and "Cretaceous Reptiles of the United States" (published by the Smithsonian institution); "The Extinct Mammalian Fauna of Dakota and Nebraska, together with a Synopsis of the Mammalian Remains of North America" (4to, 30 plates, Philadelphia, 1870); and "Contributions to the Extinct Vertebrate Fauna of the Western Territories" (4to, 37 plates, Washington, 1873).

**LEIGH, Benjamin Watkins**, an American lawyer, born in Chesterfield co., Va., June 18, 1781, died Feb. 2, 1849. He studied at William and Mary college, and when he became of age was admitted to the bar. He practised successfully in Petersburg, Va., and was soon elected to the legislature from Dinwiddie co., presenting in that body a series of resolutions asserting the right of the legislature to instruct the United States senators from Virginia. In 1818 he removed to Richmond, where he at once took a high place at the bar. He was one of the commissioners appointed to revise the statutes of Virginia, and reported the arguments and decisions in the court of appeals. In 1822 he was sent as commissioner to Kentucky, and, in concert with Mr. Clay on the part of that state, adjusted an agreement concerning the "occupying claimants law," which threatened to annul the Virginia titles to lands in Kentucky. He was a member of the convention of 1829-30, in which he held a prominent position, and in 1835 was elected to the United States senate, where he took an active part in debate; but finding that his views were not

those of the majority of his constituents, he resigned in 1837, and passed the remainder of his life in retirement.

**LEIGHTON, Frederick**, an English painter, born at Scarborough, Dec. 3, 1830. He studied principally in Italy and Germany. His first great work, "Cimabue finding Giotto drawing in the Fields," was produced in 1848. Among his other works are: "The Death of Brunellesco"; "Cimabue," representing the triumphal procession in Florence at the reception of that master's "Madonna," which was exhibited in 1855, and at once purchased by the queen; "Orpheus redeeming his Wife from Hades" (1856); "Scene from Romeo and Juliet" (1858); "Looking at the Autumn Fields" (1859); "Capri at Sunrise" (1860); "Paolo and Francesca" and "Lieder ohne Worte" (1861); "The Star of Bethlehem" and "Michel Angelo nursing his dying Servant" (1862); "A Girl feeding Peacocks" and "An Italian Crossbowman" (1863); "Golden Hours" (1864); "Helen of Troy," "David," and "Mother and Child" (1865); "Syracusan Bride leading Wild Beasts in Procession" (1866); "Nude Venus" (1867); and "Clytemnestra" (1874). He has illustrated several books, including George Eliot's "Romola."

**LEIGHTON, Robert**, a Scottish prelate, born in Edinburgh in 1611, died in London, June 26, 1684. He was educated at the university of Edinburgh, in 1641 became pastor of a Presbyterian church, and in 1653 principal of the university of Edinburgh. On the accession of Charles II. an attempt was made to establish episcopacy in Scotland. Leighton was favorably disposed toward the system, though his father had been savagely persecuted by Laud for his opposition to it; and, in the hope of moderating the violent dissensions of the time, he reluctantly consented to accept a bishopric, choosing that of Dumblane as being one of the poorest in revenue. In 1670, on the resignation of Sharpe, he was transferred to the archbishopric of Glasgow; but finding himself unequal to the difficulties of his new dignity, he resigned it in 1674, retired to England, and spent his remaining days in that country. He left various works, the best known of which is his "Practical Commentary on the First Epistle General of St. Peter." A complete edition of his writings appeared in 1808 (6 vols. 8vo, London). Among other editions is that by Pearson (London, 1828, and New York, 1859); the latest edition was published in London in 1871, in 6 vols.

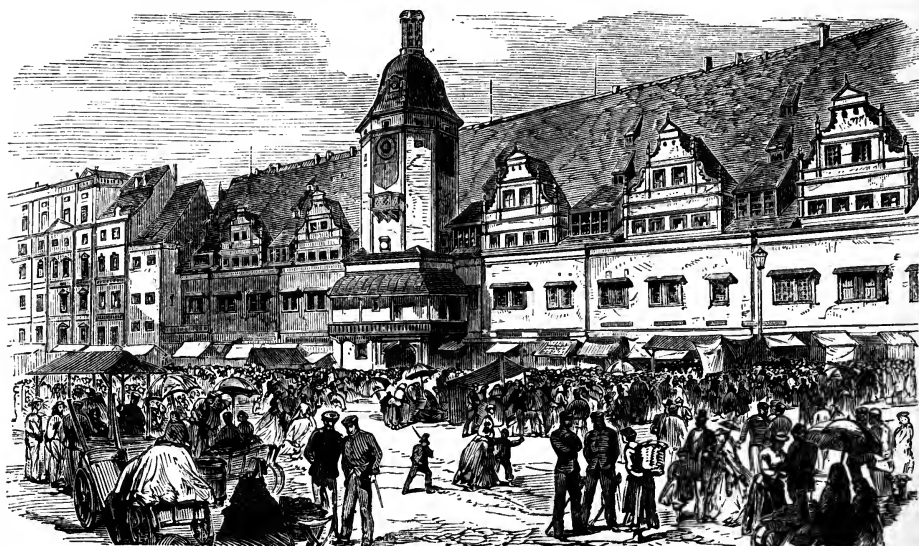
**LEINSTER**, one of the four provinces of Ireland, constituting the S. E. part of the island, between lat. 52° 7' and 54° 6' N., and lon. 6° and 8° 8' W., bounded N. by Ulster, E. by St. George's channel, S. by the Irish sea, and W. by Munster and Connaught; length N. and S., 132 m.; greatest breadth, 82 m.; area, 7,558 sq. m.; pop. in 1871, 1,335,966 (in 1841, 1,973,781). It is divided into 12 counties: Carlow, Dublin, Kildare, Kilkenny, King's,

Longford, Louth, Meath, Queen's, Westmeath, Wexford, and Wicklow, besides the cities of Dublin and Kilkenny, and the town of Drogheda, which are counties in themselves. The coast is generally low, but in some places bold and rocky. The best harbors are at Dublin, Drogheda, Dundalk, and Carlingford. There are no large lakes. The province contains six navigable rivers, the Shannon, Barrow, Nore, Boyne, Liffey, and Slaney. The surface is partly level and partly rolling, being on the whole the least broken portion of Ireland. There are three or four mountain groups occupying parts of Dublin, Wicklow, Carlow, Wexford, Queen's, and King's counties, and a few hills in Westmeath, Louth, and Kilkenny. Elsewhere are large peat fields, the principal of which is the great bog of Allen. The soil, resting on limestone and clay slate, is the best

in the kingdom. The Kilkenny coal field, between the Barrow and Nore, is the most extensively worked in Ireland, and also produces excellent ironstone. Wicklow has five copper and four lead mines, yielding silver, and in Croghan there is a gold mine, now abandoned. At the time of the Anglo-Norman invasion in the 12th century Leinster was divided into two kingdoms, Meath in the north and Legania or Leinster proper in the south.

**LEIPA**, a town of Bohemia, on the Bolzen, 41 m. N. by E. of Prague; pop. in 1869, 9,244. It has a gymnasium, and a flourishing industry, the principal manufactures being cloth, linen, steel ware, cotton goods, and vinegar. The town suffered severely during the Hussite, thirty years', and seven years' wars.

**LEIPSIC** (Ger. *Leipzig*), a city of Saxony, in an extensive and fertile valley, watered by the



Town Hall and Market Place, Leipsic.

Pleisse, here joined by the Elster and other small rivers, within a few miles of the Prussian frontier, 60 m. W. N. W. of Dresden, and 92 m. S. S. W. of Berlin; pop. in 1871, 106,925. Most of the ancient fortifications, excepting the castle or citadel of Pleissenburg, have been converted into public walks and partly laid out as gardens. The most fashionable public square is the Augustusplatz; and the most picturesque from the quaintness of its buildings, particularly of the town hall (*Rathhaus*), is the Markt-platz. The allied sovereigns met in this square after the battle of Leipsic, previous to which Napoleon had resided there in the *Königshaus*, so called from having formerly served as an electoral and royal residence. Near the square stands Auerbach's cellar, made famous by Goethe's "Faust," and still frequented by the students. The principal Protestant churches

are those of St. Nicholas, St. Thomas, and St. Paul's or university church. Leipsic contains monuments of Gellert, Prince Poniatowski, who was drowned in the Elster at the close of the great battle in 1813, Hahnemann, Bach, and other eminent persons. Among the principal public buildings are the observatory, which occupies the tower of the citadel of Pleissenburg, the general exchange and book exchange, the Saxon-Bavarian railway depot, the post office, the custom house (finished in 1853), the new city theatre (finished in 1868), and the new city hospital (opened in 1871). Leipsic takes a foremost position in Germany, in the history of the reformation as well as of literature. The university is one of the oldest in Germany; the 450th anniversary of its foundation was celebrated in December, 1859. Prominent among the university buildings is

the *Augusteum*, 300 ft. long and three stories high, containing a great hall, lecture room, museums of natural history, and a library with 200,000 volumes and 2,500 manuscripts. The use of the German language as a medium of public learned instruction was first introduced at Leipsic in 1688 by Thomasius, the son of the teacher of Leibnitz. The university is one of the few scholastic establishments on the continent which have retained their own landed estates. The property of the institution is very considerable, and embraces, besides a number of landed estates, 41 large buildings in the city; and the endowment for stipends, free board, &c., amounts to over \$500,000, nearly 200 poor students being sometimes supported by the university. Philology was long the great speciality of the university, although many of its leading members have been eminent in other branches. About the middle of the present century the university suffered greatly from the anti-liberal policy of the Saxon government, which caused a number of the most eminent professors to leave, and the attendance of students diminished from 1,300 in the early part of the century to about 800 in 1860. Since then it has not only recovered from these losses, but become in every respect one of the most prominent universities of Germany. The number of matriculated students rose to 1,179 in 1866, 1,803 in 1871, 2,204 in 1872, 2,650 in 1873, and 2,876 for the winter of 1873-'4, including 45 from the United States. The numbers for the last two years exceeded those of any other German university. Among its 107 professors were some of the most eminent scholars of Germany; as Delitzsch and Tischendorf in the theological faculty; Wächter and Hänel in the law faculty; Weber, Wunderlich, Czermak, Bock, and Carus in the medical faculty; the philosophers Ahrens and Drobisch, the geographer Peschel, the astronomer Bruhns, the naturalists Kolbe and Leuckart, the historians Wuttke and Voigt, the philologists Ritschl, Curtius, and Lange, and the orientalists Ebers, Brockhaus, and Fleischer. The university building has been greatly enlarged; a third chemical laboratory was established in 1867, a physiological laboratory in 1869, and a pathological laboratory in 1871. A new building for the physical institute was begun in 1872, and another for the anatomical institute in 1873. The budget for 1872 appropriated for the university 169,000 thalers. Besides this university, Leipsic has an agricultural institute, two gymnasia, a *Realschule*, one of the largest commercial schools of Germany, an industrial school, institutions for the deaf and dumb and the blind, and a number of other schools. It possesses also a town library with a remarkable collection of oriental manuscripts and Turkish works, and a considerable number of societies and journals for the promotion of science, letters, and art. A conservatory of music was founded by Mendelssohn-Bartholdy in 1843, and a professorship of music was es-

tablished in the university in 1860. Few towns are more devoted to the cultivation of music and the drama. Since 1871 Leipsic has been the seat of the supreme commercial court of the German empire.—The three annual commercial fairs of Leipsic are the most important in Europe, and are attended by persons of almost all nations, but chiefly by Germans and merchants from Poland, Russia, and other Slavic countries. The number of visitors is usually about 60,000, and the transactions amount to about \$50,000,000 annually. Notwithstanding the commercial magnitude of its fairs, Leipsic is still more extensively known by the book trade of which it is the centre. In 1871 there were in the city 249 publishers and booksellers. The principal publishing houses are those of Brockhaus and B. Tauchnitz. The number of printing offices was 50, and of bookbinding establishments 180. Five principal railways have their depots at Leipsic, and a number of less important lines branch off from here. Among the chief manufactures are tobacco, cigars, and pianos.—Leipsic is first mentioned as a town in the beginning of the 11th century, and its commercial importance began as early as the 13th. It suffered much during the thirty years' war, and the great victory of Gustavus Adolphus over Tilly, Sept. 7, 1631, was gained in its vicinity at Breitenfeld. On Oct. 16–19, 1813, was fought the memorable battle of Leipsic, called by the Germans the great *Völkerschlacht*, which precipitated the downfall of Napoleon, already weakened in his resources by the disasters of the Russian campaign. On the 16th the main army of the allied troops of Russia, Prussia, and Austria, about 160,000 strong, under Prince Schwarzenberg, attacked the French stationed in and around Leipsic, and from 9 o'clock in the morning until noon a series of villages on the south of the city occupied by the French were furiously but unsuccessfully assaulted. Napoleon, assuming the offensive, then adopted his favorite measure of a grand attack on the enemy's centre, and a powerful column of the old and young guards, preceded by a train of artillery, pierced the allied army. Schwarzenberg ordered up his reserves, and Napoleon doing the same, a general engagement ensued along the whole line of attack, distinguished by frequent charges of immense bodies of cavalry. At one time Murat at the head of the cuirassiers of the old guard nearly succeeded in capturing the emperor of Russia and the king of Prussia; but the Cossacks of the imperial guard and the Austrian reserves coming up to the front at all points, the French were checked, and at nightfall both armies remained nearly in the position they had occupied in the morning. The only decided success of the French was on the western side of Leipsic, where Bertrand drove back the Austrians under Gyulai, and preserved a line of retreat through Lindenau in case of disaster. During the engagement between the main armies Blücher arrived from Halle with the army of Silesia, about

60,000 strong, and after an obstinate conflict drove Marmont out of the village of Möckern. On the 17th, a Sunday, both armies by tacit agreement rested, and Napoleon, conscious of his weakness, made an ineffectual attempt to procure an armistice. The 18th found his forces, about 160,000 in number, arranged in a semi-circle around the north, east, and south of the city; while to oppose him Schwarzenberg, strengthened by the arrival of the Russian reserves under Benningsen and Bernadotte's army of the north, brought into the field 300,000 men and nearly 1,400 cannon. Against these odds the French fought with heroic courage, and their artillery, amounting to 800 pieces, was played with a rapidity and effect which for a long time kept their assailants in check. Gradually their circle of defence was narrowed, and at a critical period of the day they were weakened by the defection of large bodies of Saxon and Württemberg troops, who immediately turned their guns against their former comrades. The allies having at length penetrated into the suburb of Schönfeld, Napoleon became convinced that the city was no longer tenable, and, taking advantage of a cessation of hostilities at nightfall, commenced a retreat. Amid a scene of fearful confusion the French filed off through Lindenau. Early on the morning of the 19th the allies forced an entrance into the city, and a terrible conflict ensued with the French rear guard, who were encumbered with immense trains of baggage and artillery and crowds of wounded. In the height of the mêlée the bridge of Lindenau, the only outlet of retreat over the river Elster, was prematurely blown up, leaving 12,000 soldiers, besides 25,000 sick and wounded, in the hands of the allies. Marshal Macdonald by great exertion succeeded in swimming his horse across the river, but Prince Poniatowski in attempting the passage was drowned. The total loss of the French during the three days of fighting was more than 60,000; that of the allies 50,000. At 2 P. M. on the 19th the carnage ceased, and Napoleon was in full retreat toward the Rhine.

**LEISLER, Jacob**, an American adventurer, born in Frankfort, Germany, executed in New York, May 16, 1691. He came to America in 1660 as a soldier in the service of the Dutch West India company. Leaving the army soon after his arrival, he engaged in the Indian trade, and became a comparatively wealthy man. In 1674 he was appointed a commissioner of the forced loan imposed by Colve. While on a voyage to Europe in 1678 he was captured by Moorish pirates, and was compelled to pay a ransom of 2,050 pieces of eight to obtain his freedom. Previous to this voyage he was a resident of Albany, and had been involved in the ecclesiastical difficulties of that city in 1676, in which he suffered both in character and purse, having been mulcted in the entire cost of the litigation which was instituted by him and Jacob Milborne, who after-

ward became his son-in-law as well as his secretary and fellow sufferer. Under Dongan's administration in 1683 he was appointed one of the judges, or "commissioners" as they were styled, of the court of admiralty in New York. In 1683 Gov. Dongan was succeeded by Lieut. Gov. Francis Nicholson, who was in command of the colony when Jacob Leisler, supported by the mass of the lower orders of the inhabitants, seized the fort and the public funds on the last of May, 1689, for "the preservation of the Protestant religion." On June 2 Leisler with his own train band of 49 men took possession of the fort, and resolved, as he expressed it himself, not to leave until he had brought all the train bands fully to join with him. On the next day he declared for the prince of Orange. A committee of safety was then formed, who on June 8 commissioned Leisler as "captain of the fort." In this capacity he at once began to repair the fort, and strengthened it with a "battery" of six guns beyond its walls, which was the origin of that public park still known as the Battery. Nicholson and the council of the province, with the authorities of the city, headed by Stephanus van Cortlandt the mayor, attempted by pacific means to prevent the uprising, but without effect. Becoming finally alarmed for their own safety, the lieutenant governor sailed for England, and the mayor with the other officials retired to Albany. On Aug. 16 the committee of safety appointed Leisler "commander-in-chief of the province," with the full power of a governor in all matters civil and military. He now attempted to reduce Albany and the northern parts of the colony, which from the first had refused to recognize his authority, although that city, as well as the whole province, had acknowledged William and Mary immediately on the arrival of the news of the great revolution in England. Milborne was sent in November with an armed force to Albany, to assist in its defence against some Indian hostilities which were threatened, but directed by Leisler to withhold it unless his own authority was recognized. This was refused, and Milborne returned unsuccessful. In December arrived a despatch from William and Mary directed "to Francis Nicholson, Esq., or in his absence to such as for the time being takes care for preserving the peace and administering the laws in his majesty's province of New York." This Leisler construed as an appointment of himself as the king's lieutenant governor. He therefore dissolved the committee of safety, swore in a council, and assumed the style of a royal lieutenant governor and commander-in-chief. After the massacre at Schenectady in February, 1690, he engaged with great vigor in the expeditions against the French, and equipped and despatched against Quebec the first fleet of men-of-war sent forth from the port of New York. A few months later Major Ingoldesby arrived with the news of Sloughter's appointment as governor, and demanded possession of



the fort, which Leisler refused. On Slougher's own demand immediately upon his arrival in March, 1691, he likewise refused to surrender it, until he was convinced of Slougher's identity, and the latter had sworn in his council. Leisler was immediately imprisoned, charged with treason and murder, and shortly after tried and condemned to death. His son-in-law and secretary Milborne was also condemned on the same charges. These trials were manifestly unjust; the judges were the personal and political enemies of the prisoners, and so gross were the acts of some of the parties that Slougher hesitated at signing the death warrants, and it is said that he finally did so when under the influence of wine. By the English law of treason their estates were forfeited to the crown, but the committee of the privy council to whom the matter was referred reported that although the trial was in conformity to the forms of law, they nevertheless recommended the restoration of the estates of the culprits to their heirs. In 1695 Leisler's son succeeded in procuring the passage of an act of parliament reversing his father's attainder. In 1698 the earl of Bellamont, who had been one of the most influential supporters of the efforts of Leisler's son, was appointed governor of New York, and through his influence the assembly voted an indemnity to Leisler's heirs. The bones of Leisler and Milborne were taken up and honorably interred in the Dutch church.

**LEITH**, a seaport town of Edinburghshire, Scotland, situated on the Water of Leith at its confluence with the frith of Forth, almost adjoining Edinburgh; pop. in 1871, 44,280. Until the passing of the burgh reform act of 1833, it was dependent upon and governed by the city of Edinburgh, of which it forms the port. It has a Latin school, a mechanics' hall, several hospitals, and a public library. Among its numerous manufactures are sail cloth, glass ware, soap, paints, and chemicals. The town is built on the low ground adjoining the frith. The more ancient streets and lanes are narrow and tortuous, but those of the modern part of the town are commodious and well built. The harbor, originally a difficult one, on account of the sands brought down by the river accumulating within it, is now one of the most commodious on the E. coast; and its piers, docks, and other works which have been constructed within the present century afford excellent accommodation for shipping. A large portion of the trade of this port is with the Hanse towns, Holland, Denmark, and the Russian Baltic ports. The coastwise entrances during the year ending Sept. 30, 1871, were 2,878, tonnage 292,354; the clearances 3,445, tonnage 382,199. The entrances from the colonies and foreign countries were 1,444, tonnage 423,211; the clearances to the same 882, tonnage 335,789. Of the entrances 1,504, tonnage 435,128, and of the clearances 1,310, tonnage 388,555, were foreign vessels. The customs revenue for the same period amounted to £164,245.

**LEITHA** (Hun. *Lajta*), a river of Austria, an affluent of the Danube. It rises at Haderswerth, in Lower Austria, constitutes for some distance the boundary between the two divisions of the Austro-Hungarian monarchy, which on that account are designated as Cisleithania and Transleithania (see AUSTRIA), and falls near Altenburg, in Hungary, into a branch of the Danube. On the right bank of the Leitha are the Leitha mountains, 1,600 to 2,400 ft. high.

**LEITMERITZ** (Boh. *Litomeřice*), a town of Bohemia, on the right bank of the Elbe, which is crossed here by a long bridge, 33 m. N. W. of Prague; pop. in 1870, 10,023. It is partly fortified and beautifully situated, and is the capital of a circle which, on account of the extent, fertility, and beauty of its gardens, is called the Bohemian paradise. It contains a magnificent cathedral founded in 1054, 11 other churches, a fine episcopal palace surrounded with walls, a town hall with extensive archives, a theological seminary, a gymnasium, a normal and other schools, several convents, and a nunnery. Straw hats and leather and other articles are manufactured; the shipping business and the fisheries, particularly in salmon, are important; and the trade is active in fruit and also in grain. The best Bohemian wines are produced in this district, and much of the Bohemian glass is polished here.

**LEITOMISCHL** (Boh. *Litomyšl*), a town of Bohemia, on the Laucna, 84 m. E. S. E. of Prague; pop. in 1870, 7,021. It has a palace with a library, picture gallery, and other attractions; a college of the Piarists, with one of the most beautiful churches of Bohemia; a gymnasium and other schools; about 100 distilleries of brandy, and manufactories of linen.

**LEITRIM**, a N. W. county of Ireland, in the province of Connaught, bordering on Donegal bay and the counties Donegal, Fermanagh, Cavan, Longford, Roscommon, and Sligo; area, 613 sq. m.; pop. in 1871, 95,324. Lough Allen divides it into two very nearly equal parts, that lying S. being chiefly an undulating plain, bounded W. by the Shannon, and that lying N. hilly with intermediate valleys traversed by fertilizing streams. Loughs Macnean (4 by 2 m.) and Melvin (8 by 2 m.) separate the N. E. part of the county from Fermanagh, and the river Duff separates it from Sligo. The coast for the most part is a rocky bluff rising above a rough stony beach, and exposed to the whole swell of the Atlantic. It has no port or harbor; there are salmon fisheries at the mouths of the rivers. The principal streams are the Shannon, Rinn, and Bonnet. The surface is diversified, and in the valleys and plains the soil is extremely fertile. Near Lough Allen is an extensive coal formation. Lead, copper, and manganese are found. The climate is raw and damp, but more genial in the south than in the north. The principal crops are potatoes, oats, and hay; the county generally is more adapted to grazing than tillage. The manufactures are linens and woollens for domestic

use, and coarse pottery. The principal towns are Carrick-on-Shannon (the county town), Manor Hamilton, and Mohill.

**LEJEAN, Guillaume**, a French traveller, born at Plouégat-Guérand, Finistère, in 1825, died there, Feb. 1, 1871. He became known in 1847 by a historical work relating to Morlaix, and in 1850 by one upon Brittany. Under the patronage of the government he explored European Turkey in 1857. In 1860-'61 he visited the region of the upper and the White Nile. In 1862 he was appointed consul in Abyssinia, and in 1863 was imprisoned and expelled by Theodoros. Before returning to Paris he explored several districts of northern Abyssinia, and at the end of 1865 he set out again for the East, and reached Cashmere; but not being able to advance to Bokhara, he resumed from 1867 to 1870 his explorations of Turkey. He published *Voyage aux deux Nils* (Paris, 1865).

**LEJEUNE, Henry**, an English painter, of Flemish descent, born in London about 1819. He was admitted as a student at the royal academy in 1834. In 1840 he exhibited his painting of "Joseph interpreting the Dream of Pharaoh's Butler," and in 1841 obtained the gold medal for "Samson bursting his Bonds." In 1845 he became head master of the painting school of the royal academy, and in 1848 curator of the school, which post he resigned in 1864. In 1863 he was elected an associate of the academy. Among his numerous works are: "Samson" and "Una and the Lion" (1842); "Prospero and Miranda" (1844); "Ruth and Boaz" (1845); "Bassanio choosing the Casket" and "The Liberation of the Slaves" (1847); "Pan teaching Apollo" (1848); "Ophelia" and "Lear and Cordelia" (1849); "The Sermon on the Mount" (1851); "What shall I do to inherit Eternal Life?" (1852); "Infant Prayer" (1853); "Christ blessing Little Children" (1855); "Mary Magdalen at the Sepulchre" (1856); "The Vision of Queen Catharine" (1857); "The early Days of Timothy" and "Children gathering Water Lilies" (1858).

**LEJEUNE, Louis François**, a French general and painter, born in Strasburg in 1775, died in Toulouse in 1848. He enlisted in the army in 1792, and was placed in 1799 on the staff of Berthier, minister of war. His valor at Marengo and Austerlitz won for him successive promotions. In 1809, after the battle of Essling, he crossed in a boat, at the risk of his life, to the island of Lobau, where Napoleon was shut up, and brought back orders to Bessières and Masséna which decided the victory of Wagram. After the battle of Borodino he became brigadier general, and subsequently distinguished himself at Lützen and Bautzen. Under the restoration he was attached to the general staff, and after the overthrow of Charles X. he went to Toulouse as director of the school of fine arts and of industry. His painting of the battle of Marengo was pur-

chased in 1801 by the government, and he subsequently painted the battles of Aboukir, Mount Tabor, Lodi, the Pyramids, Borodino, and others. In the latter part of his life he confined himself to landscape painting.

**LE JEUNE, Paul**, a French missionary, born in 1592, died in Paris, Aug. 7, 1664. He entered the society of Jesus, and acquired reputation as a director. He was rector of the college of Dieppe before he went to Canada, in 1632, as first superior of the Jesuit missions after the country was restored to France. He remained in office till 1639, and was editor of some of the Jesuit "Relations." After his return to France he became procurator of the foreign missions. He wrote a "Ten Days' Retreat" and other pious works.

**LEKAIN, Henri Louis Cain**, a French tragedian, born in Paris, April 14, 1728, died Feb. 8, 1778. He was the son of a goldsmith, and after studying at the Mazarin college, where he imbibed a taste for the dramatic art, he was placed at his father's trade. His performance as a member of a private dramatic association attracted the notice of Voltaire, who procured for him permission to appear on the stage at the Théâtre Français, where he met with bitter opposition. He persevered, corrected his faults, and after 17 months obtained a regular engagement. His fame has scarcely been equalled by that of Talma or Rachel. He was peculiarly great in most of Voltaire's tragedies. His *Mémoires* were published by his son in 1801, and reprinted at Paris in 1825 under the supervision of Talma.

**LELAND, Charles Godfrey**, an American author, born in Philadelphia, Aug. 15, 1824. He graduated at Princeton college in 1846, and subsequently studied at the universities of Heidelberg, Munich, and Paris, devoting himself more particularly to the modern languages, aesthetics, history, and philosophy. He was residing in the last named city during the revolutionary outbreak in February, 1848, and was one of the American deputation sent to congratulate the provisional government. He returned to Philadelphia in the same year, studied law, and was admitted to the bar; but he soon relinquished that profession for the pursuit of literature. He was connected as editor or contributor with several American periodicals, but for some years has resided chiefly in Europe. His works, some of which are of a humorous or burlesque character, are as follows: "The Poetry and Mystery of Dreams" (Philadelphia, 1855); "Meister Karl's Sketch Book" (1855); "Pictures of Travel," a translation of Heine's *Reisebilder* (1856); "Sunshine in Thought" (New York, 1862); "Legends of Birds," illustrated (Philadelphia, 1864); "Hans Breitmann's Ballads" (5 parts, 1867 *et seq.*; complete ed., 1870); "The Music Lessons of Confucius and other Poems" (London, 1871); a translation of the humorous poems of Scheffel (1871); "Egyptian Sketch Book;" and "The English Gipsies and their Language" (1873).

**LELAND, John**, an English Presbyterian divine, born in Wigan, Lancashire, in 1691, died in Dublin, Jan. 16, 1766. He passed his life as pastor of a Presbyterian congregation in Dublin, and received the degree of D. D. from the university of Aberdeen. Though engaged through life in polemical warfare, he was remarkable for charity and candor. His principal works are: "The Divine Authority of the Old and New Testament" (2 vols. 8vo, 1739-'40); "View of the Principal Deistical Writers that have appeared in England in the Past and Present Century" (1754); and "The Advantage and Necessity of the Christian Revelation" (2 vols. 4to, 1764).

**LELAND, John**, an American clergyman, born in Grafton, Mass., May 14, 1754, died in North Adams, Mass., Jan. 14, 1841. He was licensed as a Baptist preacher in 1774, and in 1775 removed to Virginia, where until 1791, with the exception of occasional visits to the north, he was actively employed in discharging the duties of his office. In February, 1792, he settled in Cheshire, in western Massachusetts, where he resided for the most part until his death. He was a prolific writer, and during his long ministry preached many thousand sermons, and baptized more persons probably than any one of his contemporaries. His occasional sermons, addresses, and essays, together with his autobiography and additional notices of his life by Miss L. F. Green, were published in 1845 (1 vol. 8vo). He was a man of much eccentricity and shrewdness, and throughout his life took the warmest interest in politics. Toward the close of 1801 he went to Washington to present to Mr. Jefferson a mammoth cheese weighing 1,450 lbs., as a testimonial of the esteem and confidence of the people of Cheshire in the new chief magistrate. He was firmly attached to the democratic party, and sometimes manifested his predilections in his pulpit discourses.

**LELEGES**, an ancient people, who appear in the early traditions of the W. coast of Asia Minor, of the islands of the Ægean sea, and of various countries of Hellas and Peloponnesus, but whose history is involved in great obscurity. They are mentioned in Homer as the allies of the Trojans; Herodotus identifies them with the Carians; and Pausanias regards them as a part of the latter people. They seem to have been of Pelasgian race, and to have become connected with the Carians after an emigration from the continent of Greece to the islands, whence they followed them to Asia Minor.

**LELEWEL, Joachim**, a Polish historian, born in Warsaw, March 20, 1786, died in Brussels, May 29, 1861. He studied history at Wilna, and was appointed professor of history at Kremenetz in Volhynia, and afterward at the university of Wilna. He rose to the first rank among Polish historians, but in 1822 was removed for his revolutionary language. Having returned to Warsaw, he was in 1830 elected to the diet, and was a member of the various revolutionary governments which succeeded

each other before the events of Aug. 15, 1831. After the fall of Warsaw he went to Paris, where he was placed at the head of a Polish democratic committee, and became involved in controversies with Czartoryski, Bem, and other refugees belonging to the aristocratic party. The committee was dissolved, Lelewel removed from Paris by order of the government of Louis Philippe, and finally, after the failure of several Polish conspiracies in various countries, he was banished from France. He took up his residence at Brussels, where he lectured on history at the new university, and lived a life of self-imposed poverty and incessant literary labors. Among his numerous works, in Polish, French, and German, are: a "History of Poland" for the young (Warsaw, 1829); "Treatises on Geographical and Historical Subjects" (Leipsic, 1836); "Numismatics of the Middle Ages" (Paris, 1836); "Numismatical Studies" (Brussels, 1840); "Poland Regenerated" (Brussels, 1843); "Poland in the Middle Ages" (Posen, 1846-'51); "Geography of the Arabs" (Paris, 1851); and "Geography of the Middle Ages," with an atlas engraved by himself (4 vols., Brussels, 1852-'7).

**LELEUX, Adolphe**, a French painter, born in Paris, Nov. 15, 1812. He early exhibited landscapes and genre pictures representing the scenery and life of Brittany, and subsequently excelled in delineating incidents of the revolution of 1848. In his latest pictures he has resumed his sketches of Brittany.—His brother **ARMAND**, born in 1818, excels in the same sphere of art; but the scenes of several of his pictures are laid in Switzerland and Italy. The wife of the latter, **ÉMILIE GIRAUD**, born in Geneva in 1834, excels as a genre painter. Among her later works are "The Marriage Contract" (1866), "A Supper of Actors" (1868), and "The Singing Teacher" (1869).

**LELY, Sir Peter**, an English painter, born in Soest, Westphalia, in 1617, died in England in 1680. His family name was originally Van Der Faes, but his father assumed the name of Lely. He was instructed in painting by Peter Greber of Haarlem, and at 20 years of age had acquired reputation by his landscapes and portraits. Visiting England in 1641, he determined to follow the example of Vandyke, and thenceforth devoted himself almost exclusively to portrait painting, in which he soon surpassed all his contemporaries. The prince of Orange introduced him in 1643 to the notice of Charles I., who sat to him for his portrait. During the commonwealth he remained in England, and is said to have painted the portrait of Cromwell, who warned him that unless he made a true likeness, with all the roughnesses, pimples, and warts as he saw them, he should not receive a farthing for the picture. At the restoration he became court painter to Charles II., who made him a knight, and he acquired wealth. He excelled in female portraits, and painted a celebrated series of the "Beauties of the Court of Charles II.," preserved at Hamp-

ton Court. The landscapes in his pieces were generally executed by other hands. He occasionally painted historical pictures, of which the best known is "Susannah and the Elders," at Bursleigh house.

**LEMAIRE, Nicolas Éloi**, a French scholar, born at Triancourt, Champagne, Dec. 1, 1767, died Oct. 3, 1832. He completed his studies in the college of Ste. Barbe in Paris, and became professor of rhetoric in 1790. Embracing extreme revolutionary opinions, he was a deputy judge in 1793. Under the consulate he travelled in Italy, and delivered Latin improvisations in several cities. He obtained in 1811 the chair of Latin poetry at the collège de France. Under the restoration he began the *Bibliotheca Classica Latina* (154 vols., Paris, 1818 *et seq.*), which he left unfinished at his death. It embraces 18 poets and 16 prose writers. He is the author also of several original Latin poems.

**LEMAIRE, Philippe Henri**, a French sculptor, born in Valenciennes in 1798. He studied in Paris and Rome, and exhibited in 1827 a statue of a young girl holding a butterfly, which was purchased by the duchess of Berry. Several of his subsequent works were placed in the Tuileries, the Luxembourg, and Versailles. For his colossal group in front of the Madeleine, representing "Christ pardoning Mary Magdalen," he was made an officer of the legion of honor in 1843, and a member of the academy in 1845. Among his later works are statues of Henry IV. for the hôtel de ville, of Hoche at Versailles, of Napoleon at the exchange of Lille, and of Froissart at Valenciennes.

**LEMATRE, Frédéric**, a French actor, born in Havre about 1800. At an early age he prepared himself for the stage. In 1822 he failed in a competition for prizes offered to the pupils of the conservatory, only a single vote being recorded in his favor, but that was given by Talma. In 1823 he made his début at the Ambigu Comique, but his reputation was not firmly established till 1834 by his personation of Robert Macaire, at the Folies Dramatiques, in the play of that name, of which he was one of the authors. His rendering of Alexandre Dumas's *Kean*, and particularly of Victor Hugo's *Ruy Blas* (1836), and of Balzac's *Vautrin* (1840) added to his fame, although not even his acting could save the latter play from being withdrawn on account of its reflections upon Louis Philippe. In 1842 he played for some time at the Théâtre Français, but his genius was not suited to those classic boards. He subsequently performed alternately at the Porte St. Martin, the Gaité, the Variétés, the Odéon, and the Ambigu Comique, where he was so successful in amusing the audiences in his comic and moving them in his tragic parts, that he was often called the Talma of the boulevards. Among his most popular performances, besides Robert Macaire, were Don César de Bazan and Toussaint l'Ouverture. He won great applause in *Le vieux caporal* (1853), *Henri III.* (1856), and *Le maître d'école* (1859).

He afterward retired from the stage for some years; but in October, 1873, he again made his appearance, playing the part of the nameless Jew in Victor Hugo's *Marie Tudor*.

**LEMAN, Lake.** See GENEVA, LAKE OF.

**LE MANS.** See MANS.

**LEMBERG, or Leopold** (Pol. *Lwów*), the capital of Austrian Galicia, on the Peltew, a small tributary of the Bug, 185 m. E. of Cracow; pop. in 1870, 87,105, nearly one third of whom were Jews. The city proper is small, but the suburbs are extensive and contain many handsome houses; and the lofty towers of the cathedral and numerous other churches, as well as the massiveness of other public edifices, give to the city an imposing appearance. The university of Lemberg, founded in 1784, had in 1872 46 professors and 1,031 students (554 Poles, 430 Ruthenians, 47 Germans). The university library in 1873 had 53,000 volumes. The city possesses also an institute, established by Ossolinski, rich in Slavic antiquities and in ancient Polish literature. Among the most noteworthy buildings are the city hall, the Count Skarbek theatre, the diet hall, the palace of the Catholic archbishop, and several convents, hospitals, and railroad depots. It is the seat of the governor of Galicia, of Roman Catholic, United Greek, and United Armenian archbishops, and of a Protestant superintendent general. Some manufactures, mainly of cloth and linen, are carried on; but it is chiefly as a commercial town, with large annual fairs, and as one of the principal corn markets of Austria, that Lemberg is important. Railway lines connect it with Cracow, Pesth, Czernowitz, and other cities. Lemberg was founded in the 13th century, taken by Casimir I. of Poland in 1340, besieged in 1648 by the revolted Cossacks under Chmielnicki, who withdrew on receiving a large ransom, and captured by the Turks in 1672, when it ceased to be of importance as a fortress. After having been more than four centuries in the possession of Poland, it came to Austria at the first partition of that country in 1772. It was bombarded by the Austrians during the outbreak of Nov. 2, 1848.

**LEMERY, Nicolas**, a French chemist, born in Rouen, Nov. 17, 1645, died in Paris, June 19, 1715. His chemical lectures in Montpellier, and subsequently in Paris, were very popular. He stripped the science of most of the prevailing charlatanry, and Fontenelle and Voltaire expressed the highest regard for his attainments. His *Cours de chimie* (Paris, 1675) passed through more than 30 editions, the best being by Baron (1756), was translated into many languages, and was the highest authority for nearly a century. On account of Lémery being a Protestant, he was deprived of his license in 1681, and after declining an offer from the elector of Brandenburg to teach chemistry in Berlin, he went to England in 1683, and was favorably received by Charles II., but soon resumed his practice in Paris. The revolution

of the edict of Nantes threatening to deprive him of all means of subsistence, he united with the Catholic church in 1686. In 1699 he was admitted to the academy of sciences as associate member, and afterward as pensioner. His principal works, besides his lectures on chemistry, are: *Pharmacopée universelle* (Paris, 1697; 8th ed., 1763); *Traité universel des drogues simples* (1698, and several later editions); and *Nouveau recueil des secrets et curiosités les plus rares* (2 vols., Amsterdam, 1709).—His son Louis (1677–1743) excelled as a physician and writer, as also his son Jacques, known as Lémery jeune (1678–1721).

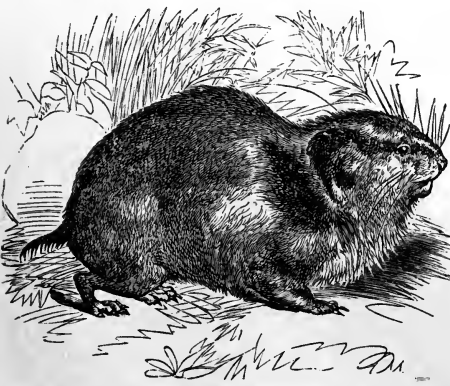
**LEMHI**, an E. county of Idaho, separated on the E. from Montana by the Rocky mountains; area, 2,000 sq. m.; pop. in 1870, 988, of whom 120 were Chinese. It is drained by the E. fork of Salmon river and by Rock creek. In 1870 there were 1 quartz and 7 placer gold mines. Capital, Salmon City.

**LEMMING**, a small rodent of the subfamily arvicolinæ or field mice, and the genus *myodes* (Pallas); authors have also referred it to *georychus* (Ill.), *lemmus* (Zinck), and *hypudæus* (Ill.). The lemmings may be distinguished from the arvicolas by the hairy soles, very short tail, long sickle-shaped claws for digging, and small size or absence of external ears; the last lower molar has four or five triangular prisms alternating with each other. The species are confined to the arctic regions of both hemispheres, and are the most northern form of rodent known; of the North American species none have been found within the United States; they live in the thick mosses and sphagnum swamps in the vicinity of the arctic circle. The Norway lemming (*M. lemmus*, Pall.) has a stout body 5 in. long, a short and broad head, short and robust legs, and coarse

dentition consists of incisors  $\frac{1}{1}$ , molars  $\frac{3}{3}$ ; the skull is massive and broad, the orbits very large, the temporal fossæ small, and the zygoma high; the incisors are thick, large, and much rounded anteriorly. The color above is yellowish and reddish with black markings, and yellowish white below. Its natural habitat is the mountainous regions of Lapland and Norway, from which it descends at irregular intervals in immense troops, which devour every green thing in their course, and commit as great devastations as the migratory locusts; it has been supposed that an unusual multiplication of these animals and an actual or anticipated scarcity of food impel them to these migrations. They move chiefly by night or early in the morning, proceeding obstinately in a direct line, swimming rivers, crossing mountains, and permitting nothing but an absolutely insurmountable obstacle to alter their straight course; many are destroyed by fire and water, by each other, and by rapacious beasts and birds. They are not disposed to live in society, but dwell in a scattered manner in holes in the ground; they lay up no regular provision for the winter's use; they produce five or six young at a time, and it is said several times in a year; the flesh, which tastes like that of the squirrel, is eaten in Lapland. The food consists of plants, seeds, roots, and any vegetable matter that comes in their way.

—The best known American species is the Hudson bay lemming (*M. torquatus*, Keys. and Blas., or *M. Hudsonius*, Wagner), a circumpolar animal, coming down as far as Labrador and more southward on the Pacific coast. There are no external ears, and the two middle claws of the fore feet are remarkably large; the color above is a mixed reddish brown and pale yellow, palest on the sides, beneath whitish, whiskers black, and sometimes with a whitish collar edged with brown on both sides; the color is white in winter, with a few black hairs interspersed. The length is about  $5\frac{1}{2}$  in.; the thumb is rudimentary on the fore feet, and the two middle toes appear to have double nails, as the callous end projects under the nail. It is an inoffensive animal, living in burrows in the ground or under stones, feeding on roots and similar substances. —For details on the lemmings, see Sir John Richardson's *Fauna Boreali-Americana*.

**LEMNOS** (now *Stalimni*, *Stalimene*, or *Limni*), a Turkish island in the Grecian archipelago, situated about 40 m. W. S. W. of the Dardanelles, in lat. 40° N., lon. 25° E.; length 22 m., greatest breadth 20 m.; area, 195 sq. m.; pop. 10,000. Lemnos may be said to have been formed by the union of two peninsulas, the bay of Paradiso N. and that of Sant' Antonio S. almost dividing it into two parts. The surface is in general hilly, and the soil light. A considerable portion of the islanders are engaged in fishing. The capital, Castro or Limni (anc. *Myrina*), stands on the W. coast, and is the residence of a Greek bishop and of the Turkish governor.



Lemming (*Myodes lemmus*).

bristly hair; the whiskers are in five horizontal series; the fore feet are provided with very long, stout, and fossorial claws, the third the longest, and the thumb rudimentary; the hind feet short and broad, well armed with claws; the short tail is densely coated with hair. The



According to Pliny, Lemnos once contained a labyrinth sustained by 150 columns, and the gates of which could be opened by a child. This island has been famous from remote antiquity for a species of earth termed *terra Lemnia*, thought by the ancients to possess extraordinary medicinal virtues. In antiquity Lemnos was sacred to Vulcan, whose workshop is placed there by some of the poets. The most ancient inhabitants are said to have been Thracians, who were succeeded by the fabulous Minyæ, and subsequently by Pelasgians. It was conquered by Darius, but delivered by Miltiades, and made an Athenian dependency.

**LEMOINE.** See *LE MOYNE*.

**LEMOINE, Gustave,** a French dramatist, born in Paris, Oct. 29, 1786. He succeeded his father as a music dealer, and published several works for the piano, and in 1836 the libretto of the comic opera *Le mauvais œil*, and many ballads, which were set to music by Mme. Loïsa Puget, whom he married. He is the author of several dramas, the most popular being *La grâce de Dieu* (1841), which has been performed more than 500 times at the Gaité theatre, and which became the text of Donizetti's *Linda di Chamounix*. An operetta by his wife, *La veilleuse*, was given in 1869.

**LEMOINE, John Emile,** a French journalist, born in London, of French parents, in 1814. He completed his studies in Paris, and became one of the editors of the *Journal des Débats*. It was mainly due to his influence that this journal opposed the royalist schemes in 1872, which led to the secession of St. Marc Girardin and other editors from that journal. Thiers appointed Lemoine librarian of the palace of Fontainebleau. He is one of the regular writers for the *Revue des Deux Mondes*, and the author of many works relating to England, Ireland, and the East, chiefly in connection with British and Russian conflicts. Among his other writings are: *La vie de Brummel* (1844); *La cour de Berlin*, *La cour de Saint-Petersbourg*, and *Caroline de Brunswick* (1846). In 1862 he collected a number of his biographical and critical essays under the title of *Études biographiques et critiques*.

**LEMON** (*citrus limonium*). The species of the genus *citrus* are not very clearly defined, and some botanists have regarded the citron, orange, shaddock, lime, and lemon, usually considered distinct, as forms derived from one species, the citron (*C. medica*); but whatever may be the difficulties presented to the botanist, horticulturally and commercially they are sufficiently distinct in the form and sensible properties of their fruit. The lemon grows wild in the north of India, and has long been in cultivation among the Arabs, who introduced it in various parts of Asia and Africa; its introduction into Europe is accredited to the crusaders, but the precise date is unknown; it is now naturalized in the West Indies and other parts of America. The botanical characters of the genus will be given under *ORANGE*,

from which the lemon differs in but few particulars except the fruit; the petiole of the orange leaf has a broad wing upon each side, while in the lemon this is very small or wanting; the flowers, usually smaller than those of the orange, have the exterior tinged with purple; the usually elongated fruit has a projection or nipple at the end opposite the stem. The oil, with which the rind abounds, has a different odor from that of the orange, and the juice, rich in citric acid, is intensely sour; to this, however, the variety known as the sweet lemon is an exception. The lemon succeeds in the same climates as the orange, and the culture of the two is the same. Over 30 varieties are enumerated, some of which, as the horned and the fingered lemons, are only known in the collections of amateurs as curious monstrosities. Those in cultivation for profit differ in size, shape, thickness, and roughness of skin, and the size and form of the nipple at the end. In a horticultural classification they are grouped as round, pear-shaped, cylindrical, gourd-shaped, wax, &c., with several varieties under each head; in commerce they are known by the names of the ports from which they are shipped, as Messina, Lisbon, &c. Very fine lemons are produced in Florida and in the southern part of California, but much less attention has been given to their cultivation than to that of the orange; as the orange is more difficult to transport than the lemon, it always brings a higher price, and the growers find it more profitable. The lemon tree is frequently cultivated in conservatories, and is a favorite as a house plant, as it is ornamental in its foliage, flower, and fruit; if not exposed to too low a temperature, the tree will survive a great deal of bad treatment, and those seen in house culture are usually in a poor condition. The tree should have a good open soil, and when not in a growing state during the winter needs but little water; new growth begins late in winter or early in spring, when it should be watered freely, and when the young wood has hardened the plant set out of doors where it will be sheltered from violent winds. The fruit, which sets in spring, remains upon the tree all winter, gradually coloring. The foliage must be washed occasionally to remove dust, and a smutty fungus which sometimes appears; and if a scale insect is found, it must be removed by the use of strong solution of soap applied with a stiff brush. The lemon is valued for its acid juice and its aromatic rind, and its domestic uses in making cooling drinks and for flavoring are well known. The juice contains nearly two per cent. of citric acid with mucilage and bitter extractive matter. (See *CITRIC ACID*.)—The oil of lemons is contained in receptacles in the outer portion of the rind; it is a volatile oil, and was formerly obtained by distillation, but the oil prepared in this manner has a less pleasant flavor than that by expression. The outer portion of the rind, or flavedo as it is

called, is removed by rasping and afterward subjected to pressure; after resting to deposit its coarse impurities, it is filtered and put into copper cans of about six gallons capacity, in which it is exported; the supply comes from the south of Europe. This oil has the same composition ( $C_{10}H_{16}$ ) as the oil of turpentine, and when kept for a long while it loses its proper flavor and has that of turpentine. The oil is largely used by confectioners and pastry cooks for flavoring; the extract of lemon sold for domestic use is a more or less concentrated solution of the oil in alcohol; when mixed with alcohol the oil retains its purity of flavor much longer than when kept by itself, and perfumers preserve this and other essential oils from deterioration by mixing them with alcohol as soon as received.

**LEMON, Mark**, an English journalist and author, born in London, Nov. 30, 1809, died at Crawley, Sussex, May 23, 1870. He was educated at a grammar school, and wrote for the press at an early age. He afterward wrote for the stage, and sometimes appeared as an amateur actor. Upon the establishment of the comic periodical "Punch," in 1841, he became its assistant editor, and from 1843 till his death he was its chief editor. He also contributed largely to other periodicals, and, either singly or in conjunction with others, produced some scores of plays, farces, and melodramas, the best known of which is "The Serious Family." His principal published works are: "The Enchanted Doll" (1849); "A Christmas Hamper, a Collection of Stories in Prose and Verse" (1859); "Wait for the End" (1863); "Legends of Number Nip," and "Loved at Last" (1864); "Falkner Lyle: Story of Two Wives," and "Leighton Hall" (1866).

**LEMON GRASS.** Under the name of oil of lemon grass there is imported from Ceylon and other parts of the East an oil much used in perfumery. The source of this oil is according to some authorities *andropogon schenanthus*, and according to others *A. citratum*. A very similar oil is imported from the same localities as the oil of citronelle; it is said by some that these oils differ only in name, and by others that they are distinct and furnished by different species of *andropogon*. *Andropogon* is a large genus among grasses, nearly 500 species being enumerated; our native representatives of the genus, known as beard grass, have nothing remarkable about them, but several of the tropical species possess decided aromatic properties in their leaves or roots. In India the roots of one species are woven into mats, which at the same time exclude the sun from apartments and give an agreeable perfume to the air as it passes through them. The plant known in our greenhouses as lemon grass is *A. schenanthus*; it has leaves which in appearance are not distinguishable from those of any other coarse grass, but when bruised they give off a most agreeable odor, almost precisely like that of

the well known sweet-scented or lemon verbena (*Lippia [Aloysia] citriodora*). The oil of lemon grass is used to make the perfume known as extract of verbena, and it is used in combination in other favorite perfumes, including the finer kinds of cologne water. Another species, *A. calamus-aromaticus*, furnishes an oil with a strong rose scent; the roots of another are known to perfumers as *vetiver*; and the pungent roots of another are called ginger grass.

**LE MONNIER, Pierre Charles**, a French astronomer, born in Paris, Nov. 23, 1715, died at Héric, near Bayeux, May 31, 1799. The son of a noted savant, he made astronomical observations at the age of 16, and before he was 21 he was received into the academy of sciences, having already presented to that body an elaborate map of the moon. In 1736 he accompanied Maupertuis to Tornea for the measurement of a degree in Lapland; and on his return, by introducing superior instruments and the methods of Flamsteed, he caused great improvements in practical astronomy. In 1742 the king gave him apartments at the Capuchins, rue St. Honoré, which he occupied till the revolution. In 1748 he went to Scotland to observe the solar eclipse, which was there almost annular, and succeeded in measuring the diameter of the moon on the disk of the sun. The results of his observations are contained in the memoirs of the academy, to nearly every volume of which he furnished one or more papers for more than 50 years. He also produced various independent works on astronomical subjects.

**LE MOYNE**, a Canadian family, several of whose members performed important parts in the history of American colonization. The family arose with CHARLES LE MOYNE, born in Normandy in 1626, died in Montreal, Canada, in 1683. He came to Canada in 1641, and after spending several years with the Hurons, settled at Montreal, where he obtained several land grants. He soon distinguished himself as an Indian fighter in a series of actions with the Iroquois, and was appointed commissary and *procureur du roi*. He was captured by the Iroquois in 1665, and held a prisoner for three months. After serving with distinction in Courcelles's and Tracy's expeditions, he was in 1668 ennobled by Louis XIV., and became seigneur of Longueil. To this the title Châteauguay was added some years after, on his acquiring that fief. He was for a long time captain of Montreal, and was recommended by De la Barre for governor of the city. He had eleven sons, of whom, besides the two most celebrated (see BIENVILLE, and IBERVILLE), the following acquired distinction. **I. Charles**, baron de Longueil, born in Montreal, Dec. 10, 1656, died there, June 8, 1729. He first served in the French army in Flanders, under Marshal d'Humières, and was made a lieutenant in the regulars; returning to Canada, he developed colonization and settled his concessions, building churches and a stone fort at Longueil. He

was wounded in an action against the English under Phips, who attacked Quebec in 1690, and was made governor of Montreal and baron in 1700; became commandant general of the colony; was active in the preparation to receive the English under Walker and Nicholson in 1711; governor of Three Rivers in 1720, and of Montreal again in 1724. He persuaded the Iroquois in 1726, in spite of the opposition of Gov. Burnet of New York, to allow him to rebuild Fort Niagara. **II. Paul**, sieur de Maricourt, born in Montreal, Dec. 15, 1663, died in March, 1704. He distinguished himself under his brother Iberville in Hudson bay and in the defence of Quebec, commanded a corps of the French forces against the Iroquois, and subsequently negotiated peace with them in 1701, and exercised great influence in the nation. **III. Joseph**, sieur de Serigny, born in Montreal, July 22, 1668, died in Rochefort, France, in 1734. In 1694 and 1697 he brought over squadrons to operate against the English on Hudson bay, in concert with his brother Iberville. He was also in command of a squadron that brought out some of the first colonists of Louisiana. He surveyed the coasts of that colony in 1718-'19; took part in the capture of Pensacola from the Spaniards, May 14, 1719, and repulsed them with great gallantry from Dauphin island, Aug. 19; was made captain of a ship of the line in 1720; and in 1723 became governor of Rochefort, which office he held at his death. **IV. Antoine**, sieur de Châteauguay, born in Montreal, July 7, 1683, died in Rochefort, France, March 21, 1747. He entered the royal army, and arrived in Louisiana in 1704 with a body of colonists. He served under Iberville in his last expeditions against the English in 1705-'6, was made commandant of the troops in Louisiana in 1717, and king's lieutenant in the colony and knight of St. Louis in 1718. He took command of Pensacola after aiding with an Indian force to effect its capture from the Spaniards, May 14, 1719, surrendered it to them on Aug. 7, and was prisoner of war till July, 1720. He resumed command at Mobile after the peace, was made governor of Martinique in 1727, returned to France in 1744, and became governor of Isle Royale, or Cape Breton, in 1745.—Besides these, three other brothers attained some prominence. **JACQUES**, sieur de Ste. Hélène, born in April, 1659, served under Iberville on several occasions, and was mortally wounded in the defence against Phips in 1690. **FRANÇOIS**, sieur de Bienville I., born March 10, 1666, was killed in battle with the Iroquois at Repentigny, June 7, 1691. **LOUIS**, sieur de Châteauguay I., born in January, 1676, was actively engaged in the operations at Hudson bay, especially in the capture of Fort Monson; was mortally wounded in the successful assault on Fort Nelson, and died Nov. 4, 1694.—Sauvolle, first colonial governor of Louisiana, who is sometimes spoken of as one of the brothers Le Moyne, was not of this family.

**LEMPA**, a river of San Salvador, and the largest stream of Central America falling into the Pacific. It rises in the lake of Guija, in the N. W. corner of San Salvador, flows nearly due E. through a broad and fertile valley for a distance of nearly 150 m., and then, turning abruptly S., breaks through the volcanic coast range of mountains, and falls into the Pacific in lat. 13° 22' N., lon. 88° 12' W. For a considerable part of its course it is navigable. It drains a wide expanse of country, has numerous large tributaries, and as a consequence is subject to sudden floods, at which times the water rises on the lower portions of the stream from 20 to 35 ft., completely submerging the neighboring country. The mouth of the river, which is broad and open, is obstructed by a bar with only 6 ft. of water; but the *estero* of Jaltepeque approaches to within a league of the river, with which it is connected by a natural channel, navigable by small boats during the rainy season.

**LEMPRIERE, John**, an English scholar, born in Jersey about 1760, died Feb. 1, 1824. He was educated at Westminster school and at Pembroke college, Oxford, where he graduated in 1792. He compiled a *Bibliotheca Classica*, or "Classical Dictionary," first published in 1788 in 8vo, and afterward enlarged to 4to. This was the chief book of reference on ancient mythology, biography, and geography until the appearance (1842-'53) of the dictionaries edited by Dr. William Smith. He also published a "Universal Biography" (4to, London, 1808), and commenced a translation of Herodotus, of which he published one volume in 1792.

**LEMUR**, the name applied to many animals of the order *quadrumana* or monkeys, of the families *galeopithecida* and *lemurida*, all of the old world. The *galeopithecida* have been described under **FLYING LEMUR**. In the true lemurs (or *prosimia*, as they are sometimes called) the upper incisors are four, mostly in pairs, separate from the canines, and the lower four or two; the feet are five-toed, with opposable thumbs on the hind ones, and the fourth finger the longest; the hind feet the longest, with the nail of the second finger incurved, the other nails flat. The name *lemur*, which signifies ghost or spectre, was given to them by Linnaeus from their nocturnal habits. More than 30 species are known, divided into five principal genera, inhabiting chiefly Madagascar, a few living in Africa and the warm regions of Asia and its archipelago. Though classed with the *quadrumana*, they come nearer to the *insectivora* in the two-horned uterus, the permanent separation of the lower jaw at the symphysis, and the openness of the orbits behind. The head is rounded, and the snout so elongated and pointed that they are often called fox-nosed monkeys; the legs are tolerably long, the eyes large and in the front of the head, the ears small, the fur soft, and the tail generally long and bushy. They are very pretty animals, and are gentle and playful in

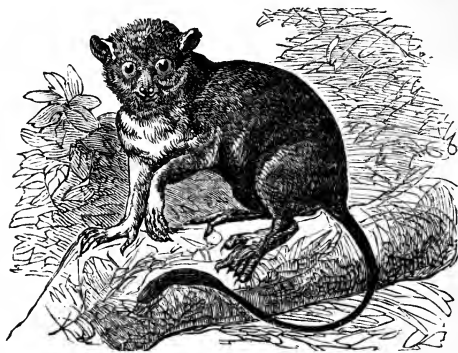
captivity; a single young one is produced at a birth, which the mother carries about for a long time, concealed in her long hair or coiled round her body, tending it with great care. The largest species is the indri (*Ichanotus brevicaudatus*, Illig.), about the size of a large



Ring-tailed Lemur (*Lemur catta*).

cat, the tail being a mere rudiment; the dental formula is: incisors  $\frac{2}{2}-\frac{2}{2}$ , canines  $\frac{1}{1}-\frac{1}{1}$ , molars  $\frac{6}{6}-\frac{6}{6}=30$ ; the color is black, with white throat, buttocks, and heels; they are tamed by the natives of Madagascar, and being very agile are trained like dogs for the chase.—The genus *lemur* (Linn.) has incisors  $\frac{2}{2}$ , canines  $\frac{1}{1}-\frac{1}{1}$ , and molars  $\frac{6}{6}-\frac{6}{6}=36$ ; the eyes are lateral; the tail long and hairy throughout. The ring-tailed lemur (*L. catta*, Linn.) is one of the most elegant species, of a delicate gray color, ruddy on the back, white below and on the cheeks, and the tail ringed with black and white; it is about 19 in. long, of which the tail is 7; it is a gentle and confiding animal, and received its specific name from its occasionally making a sound like the purring of a cat; a common name is *mococo*. The vari (*L. macaco*, Linn.) is varied by large white and black spots. The red lemur (*L. ruber*, Péron) is of a reddish chestnut color, with head, fore hands, tail, and belly black, and a white spot on the nape, being one of the few animals in which the lower parts are darker colored than the upper; it is easily tamed, gentle, agile, but sleepy during the day; the body is about 13 in. and the tail about 1½ ft. long. The name of mongous is popularly applied to all lemurs of an olive-brown color; the term *maki* is also synonymous with *lemur*, most of the species living in Madagascar. The genus *stenops* (Illig.), comprising the slow lemurs, will be noticed under Lori, the common name.—The African lemurs or galagos (*otolicnus*, Illig.) have the nails and teeth of the preceding genus, but the tarsi are elongated, the ears large and naked, the eyes large, and the tail long and tufted; they are insectivorous and frugivorous, nocturnal, and as agile as monkeys or squirrels, making great jumps; when sleeping they are said to close

the ears like bats; the flesh is eaten by the natives of Senegal. The *O. galago* (Wagn.) is about 7 in. long, and the tail about 9; it is of a grayish color, pale yellow on the legs, and the tail brown. The dwarf lemur (*O. [microcebus] pusillus*, Geoffr.), with more hairy ears; facial whiskers, and broader upper incisors, sometimes called the Madagascar rat, is 10 or 11 in. long and 6 in. high; the color is grayish fawn above and white below. In the genus *tarsius* (Storr) there are only two lower incisors, and the molars have several acute tubercles like the insectivora; the eyes are very large, the ears ample and somewhat naked, the tarsi much elongated, and the tail much longer than the body and tufted at the tip. The spectral lemur (*T. spectrum*, Geoffr.) is of a grayish brown color, living in the forests of the Indian archipelago, its long tarsi enabling



Spectral Lemur (*Tarsius spectrum*).

it to leap like a frog; the size is small.—The lemurs are very interesting as supplying transition forms between monkeys, bats, insectivora, and rodents.

**LEMURES**, or *Larvæ*, in Roman mythology, malignant spirits who were thought to haunt the earth by night and to possess great power for evil over the living. They were the spirits of bad men, and were held in much dread, while the lares or souls of the virtuous were supposed to exercise over mankind a kindly influence. According to some writers, however, the term lemures applied to all spectres of the dead, both lares and larvæ. To propitiate the latter, the Romans annually celebrated a festival in the month of May, called the *lemuria* or *lemuralia*.

**LENA**, a river of eastern Siberia, rising W. of Lake Baikal, near Irkutsk. Its direction is at first N. and then E. N. E. until it reaches Yakutsk, near lat. 62° N., lon. 130° E., where it resumes a northerly course, and preserves it until it discharges its waters through numerous mouths into the Arctic ocean. Its length is about 2,500 m., and it flows wholly within the Russian dominions. The Vitim, Aldan, and Viliui are its most important tributaries. It discharges a vast volume of water, and at

the distance of 800 m. from its mouth is 5 or 6 m. wide. It is navigable through the greater part of its course, but the surrounding country is bleak and desolate.

**LENAPES.** See DELAWARES.

**LENAU, Nikolaus**, a German poet, whose real name was NIEMBSCH VON STREHLENAU, born at Csátád, Hungary, Aug. 15, 1802, died at Oberdöbling, near Vienna, Aug. 22, 1850. He studied in Vienna, visited the United States, and resided in Vienna, Ischl, and Stuttgart. He was about to be married in 1844, when he was seized with insanity, from which he never recovered. He has been characterized as "the poet of melancholy." His most exquisite songs relate to Poland and Hungary. His larger works, the drama *Faust* (1835) and the epics *Savonarola* (1837) and *Die Albigenser* (1842), all which passed through many editions, are fine though abstruse poems, in which a lyric character predominates. He himself considered the drama *Don Juan* (1851) as his masterpiece. Anastasius Grün edited his complete works (4 vols., Stuttgart, 1855; new ed. with a biographical notice, 2 vols., 1874).

**LENAAWEE**, a S. E. county of Michigan, bordering on Ohio, and drained by Raisin and Macon rivers and several other streams; area, 735 sq. m.; pop. in 1870, 45,595. It has a rolling surface, well wooded in some places, and a fertile soil, consisting chiefly of a black sandy loam. Iron ore is found. The Michigan Southern railroad and the Detroit and Jackson branches pass through it. The chief productions in 1870 were 685,019 bushels of wheat, 964,306 of Indian corn, 402,396 of oats, 36,804 of barley, 302,402 of potatoes, 550,426 lbs. of wool, 1,467,408 of butter, 78,442 of cheese, and 68,332 tons of hay. There were 12,138 horses, 15,772 milch cows, 16,700 other cattle, 112,653 sheep, and 25,322 swine. There were numerous manufacturing establishments, including 9 of agricultural implements, 9 of brick, 38 of carriages, 1 of cars, 15 of cheese, 9 of iron castings, 11 of machinery, 2 of woolen goods, 4 breweries, 6 tanneries, 6 currying establishments, 4 planing mills, 39 saw mills, and 14 flour mills. Capital, Adrian.

**LENACAS**, a tribe of Indians occupying the high plateaus of Otoro and Intibucut, S. W. of the city of Comayagua, Honduras. They speak dialects of a language which seems to have been widely diffused through the central portions of Honduras, and which the Spaniards, following the designation of their Mexican auxiliaries, vaguely denominated Chontal, a word which signifies simply foreign or barbarous. At present the Lenacas occupy the mountain towns of Opoteca, Guajiquero, Lauteroque, Intibucut, Yamalanguira, &c., and number from 35,000 to 40,000. They are industrious, frugal, and thrifty, peaceable but brave, devotedly attached to their mountain homes, and altogether good citizens of the state.

**L'ENCLOS, Ninon or Anne de**, a French lady of pleasure, born in Paris, probably May 15, 1616,

died there, Oct. 17, 1706. Her father, a gentleman of Touraine, trained her by precept and example to a life of pleasure. She was skilled in accomplishments, and when an orphan at the age of 15 manifested precocious shrewdness in managing her property, which she so disposed of as to speedily double its value. Being beautiful, witty, and fond of cultivated society, she soon became popular in Paris, where she fixed her residence, her favors being sought by many of the most eminent men of the age. She was remarkable for being neither avaricious nor extravagant, and, with a constant succession of lovers, appears never to have depended on them for pecuniary aid. Distinguished women courted her society, and Mme. de Lafayette, Mme. de Sully, and Mme. Scarron (afterward De Maintenon) were among her friends and visitors. Christina of Sweden, during her residence in France, was warmly attached to her, and wished her to take a place in her little court, but Ninon preferred independence. She was regarded as a model of refinement and elegance in her manners. Although she led a life of pleasure far into old age, she preserved her beauty and fascination almost to the last, and is said to have had lovers for three generations in the family of Sévigné. In the works of Saint-Evremond, who was one of her lovers, are some letters by her which are the only authentic pieces from her pen, though *La coquette vengée* (Paris, 1649) and other works are attributed to her. The great Condé, La Rochefoucauld, Villars, and D'Estrées were among her most favored admirers, and the most eminent poets sang her charms. She had two sons. One, the chevalier de la Boissière, whose paternity could not be determined, rose to distinction in the navy. The other, who received from his father, the marquis de Gersay, the name of Villiers, was the victim of an unhallowed passion for his mother; he had been reared in ignorance of his birth, and at the age of 19 (his mother then being 56), on learning the secret from her lips while urging his love, he blew out his brains. This event, however, made no change in the life of Ninon, who always seemed dead to the instincts of maternal tenderness.

**LENEPVEU, Jules Eugène**, a French painter, born in Angers, Dec. 12, 1819. His first pictures were "Idyl" (1843), and "The Death of Vitellius" (1847), which latter won the Roman prize, enabling him to spend a number of years in Italy. He returned to Paris in 1853. His subsequent works comprise "The Martyrs in the Catacombs," "Pius IX. in the Sistine Chapel," and "Corpus Christi at Venice," all exhibited in 1855. His finest paintings are "A Venetian Wedding" (1857), and "Moses assisting the Daughters of Midian" (1859). In 1869 he succeeded Hesse as an academician, and in December, 1872, Hébert as director of the French school at Rome.

**LENNEP**, a town of Prussia, in the province of the Rhine, on the river Lenne, 22 m. E. of



Düsseldorf; pop. in 1871, 7,722. It has manufactory of cashmere, woollens, hats, furniture, iron ware, and powder.

**LENNEP, Jacobus van**, a Dutch novelist, born in Amsterdam, March 25, 1802, died Aug. 26, 1868. He was educated at Leyden, and produced his literary works while practising law. He is called by his countrymen the Walter Scott of Holland. His first publication was a collection of poems (1830), embodying some of the national legends. After the outbreak of the Belgian revolution he produced two political comedies, "The Frontier Village" and "The Village beyond the Frontier." He was the author of more than 50 romances, among which are: "Our Ancestors," a series of stories relating to the history of Holland; "The Rose of Dekama," translated into English by Woodley (London, 1847); and "The Adopted Son," translated by Hoskins (New York, 1847). He translated into Dutch several of the dramas of Shakespeare, and some of the poems of Southey and Tennyson. He wrote a history of northern Holland for children, a description of the old castles of Holland, and numerous operas and comedies. He also prepared a complete edition of the Dutch poet Vondel. An edition of his dramatic works was published in Amsterdam in 1852-5.

**LENNOX.** See DUMBARTONSHIRE.

**LENNOX**, a N. E. county of Ontario, Canada, bordering on the N. W. shore of Lake Ontario, just above its entrance into the St. Lawrence, and drained by the Napanee and other rivers; area, 314 sq. m.; pop. in 1871, 16,396, of whom 5,244 were of Irish, 4,649 of German, 4,349 of English, and 1,478 of Scotch origin or descent. Its S. and S. W. coast is indented by numerous inlets. The surface is diversified, and the soil, resting on beds of limestone, is very fertile. Indian corn, wheat, oats, rye, buckwheat, potatoes, and peas are the chief productions. It is traversed by the Grand Trunk railway. Capital, Napanee.

**LENNOX, Charlotte**, an English authoress, born in the city of New York in 1720, died in England, Jan. 4, 1804. Her father, Col. Ramsay, who was lieutenant governor of the colony of New York at the time of her birth, sent her to be educated in England, where she passed the remainder of her life. She married, and, having become a widow in straitened circumstances, resorted to her pen for the means of subsistence. Her chief work, "Shakespeare Illustrated" (3 vols. 12mo), is a collection of the novels and histories from which Shakespeare is supposed to have derived his plots. Among her other works are translations of "Sully's Memoirs" and "Binney's Greek Theatre," "The Female Quixote," and a variety of plays, novels, and miscellanies. She enjoyed the friendship of Dr. Johnson and Richardson, the former of whom assisted her in drawing up proposals for an edition of her works in 3 vols. 4to, which was never published. She died impoverished.

**LENOIR**, an E. county of North Carolina, traversed by Neuse river; area, 390 sq. m.; pop. in 1870, 10,434, of whom 5,532 were colored. The surface is undulating, and the soil fertile near the streams. The Atlantic and North Carolina railroad passes through it. The chief productions in 1870 were 10,332 bushels of wheat, 195,725 of Indian corn, 20,474 of peas and beans, 45,056 of sweet potatoes, 4,804 bales of cotton, and 27,690 lbs. of rice. There were 722 horses, 684 mules and asses, 1,300 milch cows, 2,422 other cattle, 1,795 sheep, and 11,441 swine; 6 flour mills, and 2 saw mills. Capital, Kinston.

**LENOIR, Charles Pélagé**, abbé, a French author, born at Créances, Marche, in 1819. He was ordained in 1841, and became a private tutor, preacher, and author. From 1857 to 1859 he edited *La Science pour Tous*. He was a friend of Lamartine, and one of the executors of the will of Proudhon, and delivered a funeral oration at the grave of Buchez. His principal works are: *Le dictionnaire des droits de la raison dans la foi* (Paris, 1860); *Sancti Alphonsi de Ligorio Theologia Moralit, ad presentem Rerum Conditionem accommodata* (4 vols., 1872); *Dictionnaire théologique de Bergier, approprié au mouvement intellectuel de la seconde moitié du XIX<sup>e</sup> siècle* (12 vols., 1872 et seq., of which he prepared 6 vols.); and *Dictionnaire des décisions romaines sur la foi, la morale et la discipline* (1873 et seq.).

**LENOIR. I. Alexandre**, a French archaeologist, born in Paris, Dec. 26, 1761, died there, June 11, 1839. He completed his studies under the painter Doyen, cultivated the drama with Talma, and wrote criticisms on paintings. He did more than any other person to preserve during the revolution the great national works of art belonging to religious establishments, by prevailing upon the authorities not to include them in the sale of other property. He saved upward of 500 renowned monuments from the fury of the mob, and was wounded in preventing the destruction of Richelieu's mausoleum in the Sorbonne. He was authorized to deposit his collection in the convent of the Petits Augustins, and he obliged the monks to surrender their art treasures. His collection became the nucleus of the celebrated *musée des monuments français*. He was also engaged in the embellishment of Malmaison and other palaces, and in the restoration of many public monuments and buildings. Lucien and Napoleon Bonaparte and Josephine promoted his undertaking, and he was the director of Josephine's private collections. His museum was closed under the restoration, and the monuments formerly belonging to churches and convents were returned to them. He continued to be employed, however, in restoring the royal vaults in the church of St. Denis, and in other works. He published numerous books, of which the principal are: *Musée des monuments français* (8 vols., Paris, 1804); *La Franc-ma-*

*connerie rendue à sa véritable origine* (5 vols., 1814); and *Nouveau essai sur les hiéroglyphes* (4 vols., 1819-'22). II. **Alexandre Albert**, a French architect, son of the preceding, born in Paris, Oct. 21, 1801. He studied under Debret in Paris and in Italy, and was the architect of a museum in the Palais des Thermes, uniting this palace with the museum of Cluny. In 1862 he became secretary of the school, and in 1869 a member of the academy of fine arts. His principal works are: *Architectur et archéologie* (Paris, 1839); *Architectur militaire au moyen âge et monuments religieux du moyen âge* (1847); and *Architectur monastique* (1852).

**LENORMAND, Marie Anne Adelaïde**, a French fortune-teller, born in Alençon, May 27, 1772, died in Paris, June 25, 1843. She was of a respectable family, but owing to the death of her father received a very incomplete education, and was for some time a seamstress. About 1790 she went to Paris, and entered a linen shop as saleswoman. In 1793 she formed a partnership with Mme. Gilbert and a baker's boy named Flammermont for the purpose of carrying on the trade of fortune-telling. Having been complained of to the police, she was arrested and imprisoned for several months. After obtaining her freedom she opened a "cabinet of divination." Her popularity was remarkable; during 40 years she was constantly visited by persons of all ranks. The court of Napoleon itself contributed much to bring her into vogue, and her ignorance and commonplace manner of divining did not injure her credit. After the fall of the empire she went to Aix-la-Chapelle, to the congress of the allied sovereigns, where she attracted much attention, especially from the emperor Alexander. She was arrested in 1809 in consequence of "indiscreet revelations," and again in 1821 for some political offence contained in a book published by her under the title of *La sibylle au congrès d'Aix-la-Chapelle*. About 1830 she sank into obscurity, and finally died at the age of 71, after predicting in one of her books that she should live to the age of 125. She became rich by her calling. She published many pamphlets, and a few books of no value with the exception of her *Souvenirs de la Belgique, cent jours d'infortune* (1822), and the *Mémoires historiques et secrets de l'impératrice Joséphine*, &c. (3 vols., 1829).

**LENORMANT. I. Charles**, a French archæologist, born in Paris, June 1, 1802, died in Athens, Nov. 24, 1859. He studied law, but during a visit to Italy became interested in archæology. In 1825 he was made inspector of fine arts; and in 1828 he accompanied the younger Champollion to Egypt, and subsequently explored the Morea. Returning to Paris, he held important positions in connection with art, antiquities, and numismatics. In 1835 he was adjunct professor to Guizot in the Sorbonne, but resigned in consequence of his alleged ultramontane views. In 1848

he was made professor of Egyptology in the collège de France. Besides many special memoirs, he wrote, separately or in conjunction with others, *Des artistes contemporains* (2 vols., 1833); *Trésor de numismatique et de glyptique* (5 vols., 1836-'50); *Élite des monuments céramo-graphiques* (4 vols., 1837-'61); *Introduction à l'histoire orientale* (1838); *Musée des antiquités égyptiennes* (1842); and *Questions historiques* (1848; 2d ed., 2 vols., 1854).—His wife, **AMÉLIE**, a niece of Mme. Récamier, acquired celebrity as a leader of fashion and by her anonymous works, among which are: *Souvenirs et correspondance tirés des papiers de Mme. Récamier* (2 vols., 1859); *Coppet et Weimar: Mme. de Staël et la grande duchesse Louise* (1862); and *Quatre femmes au temps de la révolution* (1865). II. **François**, a French archæologist, son of the preceding, born in Paris in 1835. He was educated by his father, and in 1874 succeeded Beulé as professor of archæology in the national library. He has published *Manuel d'histoire ancienne de l'orient* (in conjunction with E. Chevallier, 3 vols., 1868-'9; English ed., 2 vols., London and Philadelphia, 1869-'70); *Lettres assyriologiques et épigraphiques* (2 vols., 1871-'2); *Études accadiennes* (1873 et seq.); *La magie chez les Assyriens* (1874); *Souvenirs d'enfance et de jeunesse de Chateaubriand* (1874); and *Les premières civilisations* (1874).

**LENOX**, a town of Berkshire co., Massachusetts, on the Housatonic river and railroad, 110 m. W. of Boston and 125 m. N. by E. of New York; pop. in 1870, 1,965. The principal village is situated on the summit of a range of hills, and has a number of elegant residences. In beauty of natural scenery Lenox is not surpassed by any town in western Massachusetts, and has become a favorite summer resort. It abounds in marble of excellent quality, which has been employed in the construction of public buildings in Washington and elsewhere, and also in iron ore, and contains extensive iron works, manufactories of window and plate glass, seven public schools, including a high school, and an incorporated academy. Lenox was settled in 1750, and incorporated in 1767, receiving the family name of the duke of Richmond.

**LENS** (Lat. *lens* or *lentis*, a lentil or pea), a transparent body used for refracting light. A convex lens is usually of the form of two segments of spheres, united by their bases; such a lens is called a double convex; if the lens consist of only one segment of a sphere, that is, is spherical on one side and plane on the other, it is called a plano-convex lens. A concave lens, on the contrary, has a concavity on either side, into which part of a sphere will fit, and is called a double concave; if one side is plane and the other concave, it is called plano-concave. When one side of the lens is convex and the other concave, if the edges of the lens are thinner than the centre, it is called concavo-convex, and also a converging meniscus; if the centre of the lens is thinner than

the edges, it is called convex-concave, or diverging meniscus. Concave lenses are used in spectacles for the relief of near-sighted persons, and in the eyepiece of opera glasses and spy glasses of low power. Convex lenses are used for far-sighted persons and singly as magnifiers. They cause the rays of light which pass through them to converge toward the central line at right angles to their surfaces; so that to an eye in the right position, rays from different parts of an object make a greater angle than if they had not come through the lens. Convex lenses are also used in combination in telescopes and microscopes, in which the image formed by one lens is looked at under the magnifying power of a second. The image is formed by a convex lens, by means of its power to make the rays of light converge, which brings all the light that emanated from each point of the object again to a point in the air on the opposite side of the lens. These points of the image have nearly the same relative position as the corresponding points in the object, and may be rendered visible by being received upon smoke or vapor, or as in the camera obscura and magic lantern upon a sheet. The image in the clear air can be seen by an eye placed in a line prolonged from the object through the image. If the image be formed by a single convex lens, it will on being magnified be found to have two principal imperfections, arising from spherical and from chromatic aberration. The nature of these imperfections, and the means employed for overcoming them by the makers of optical instruments, are explained under **ABERRATION**, **ACHROMATIC LENS**, and **APLANATIC LENS**.—The material employed in the construction of lenses for optical instruments is generally crown glass which contains very little lead, and flint glass which contains much lead and has a greater refractive power. The glass should be perfectly homogeneous and free from striae. The production of such glass in masses of sufficient size to make lenses for large telescopes is a work of great difficulty. The best specimens yet produced have been from the manufactory of the Messrs. Chance of Birmingham, England, made by a process invented by Guinand, a Swiss optician, the details of which have never been made public. (See **GLASS**.)

**LENS**, a town of France, in the department of Pas-de-Calais, on the Souchez, 9 m. N. N. E. of Arras; pop. in 1866, 5,738. Lace and woollens are manufactured here, and in the neighborhood there are coal mines. In August, 1648, the French under Condé obtained here a great victory over the Spaniards.

**LENT** (Anglo-Sax. *lenoten*, Ger. *Lenz*, Dutch *lente*, spring), the springtide fast of 40 days before Easter. In the Latin church it is called *jejunium quadragesimale*, "the fast of 40 days;" and the first Sunday in Lent is called in the oldest Latin rituals *Dominica in quadragesima*, "the Sunday on the 40th day" (before Easter). Hence the almost identical appella-

tions among Latin peoples: in Italy and Portugal *quaresima*, in Spain *cuaresma*, and in France *carême* (*caresme*). Roman Catholic theologians and many Protestants maintain that this fast is, in substance, of apostolic origin; such is the opinion of St. Jerome. But the greater number of Protestants consider it to be of ecclesiastical institution. The common opinion is that it was established as a preparation for the great anniversaries of Christ's crucifixion and resurrection, and in remembrance of his fast of 40 days in the wilderness. Some authors contend that in the beginning this preparatory fast was limited to the first four days of Holy Week, embracing a fast of 40 hours, which was gradually extended to 40 days; but according to others, the fast was one of 40 days from the very first. Be that as it may, the Latin term *quadragesima* and the Greek *τεσσαρακοστή* were applied before the 4th century to a period of 40 days before Easter set apart for fasting and prayer, beginning with what is now the first Sunday of Lent, and terminating on Holy Thursday. Within this period neither Greeks nor Latins at first fasted 40 days, the Sundays and Thursdays being excepted by both, and also the Saturdays by the Greeks. As the general sentiment declared in favor of fasting 40 days, the period was lengthened both in the East and West. At Rome it became 50 days, beginning with Quinquagesima week, and in the time of Pope Melchisedes (811) it was extended to 60 days, beginning on Sexagesima Sunday. On the other hand, the Greeks began the fast on the 70th day from Easter, or Septuagesima Sunday. At length Gregory the Great (590) directed that the quadragesimal fast should begin on the 6th Sunday before Easter, and that all the intervening week days should be fasting days. As this, however, only gave 36 such days, the last four days of the preceding week were added either by that pope or by Gregory II. (715), the solemn fast thus beginning on Ash Wednesday, which thenceforward was called *caput jejunii*, "the beginning of the fast."—There is also considerable uncertainty regarding the nature of the obligation of fasting. The fasts of Holy Week seem to have been kept by all as obligatory; but the others, it is thought, were assumed as voluntary. The general custom came at length to be a general law. The council of Laodicea (about 363) prescribed entire abstinence from food on Holy Thursday and the exclusive use of "dry food" during all the fast days of Lent. The council of Orleans in 541 commanded that those who did not keep Lent should be considered as transgressing the law of the church; and the eighth council of Toledo in 646 forbade the use of flesh meat. Wine, oil, and animal food were prohibited on fasting days, and are so still in the Greek church. Their use in the Latin church was made one of the grounds of separation in the time of Photius. By degrees in the West the use of all kinds of food, except flesh,

eggs, cheese, and wine, was allowed, and became general after the 11th century; and thereafter even the use of these was permitted, flesh being alone excepted. Indeed, judging from the writings of the early fathers, the custom had been to take but one meal a day, in the evening, consisting either of "dry food" or bread and water. As the rigor of the fast was relaxed, the hour of refection was advanced from sunset to noon; and in the 13th century a slight cold collation was allowed in the evening. In the early ages also, the fast of Lent was kept with the greatest rigor by the catechumens and public penitents; by the former as a fitting preparation for their solemn baptism on Holy Saturday, and by the latter in the hope of receiving at the same time entire absolution or a mitigation of their penance. By the laws of Theodosius the Great the infliction of all species of corporal punishment was forbidden during Lent. For the same reason the council of Clermont (1095) enjoined under pain of excommunication that the universal peace called the truce of God should be observed from Ash Wednesday till Whitsuntide. In the present discipline of the Roman Catholic Church, only one meal is allowed, and at this the use of flesh meat is prohibited. Custom allows a slight refection, not exceeding two ounces in the morning, and a collation not exceeding eight ounces in the evening. This general rule is modified to suit the necessities of climate and occupation. In the United States, the use of flesh meat is allowed several times a week in accordance with the demands made by each bishop for his diocese. But fish and flesh are never allowed during Lent at the same meal. In Spain, the Spanish colonies, and Spanish America, by the payment of a trifling sum, one can purchase during Lent the privilege of the *cruzada*, which is the perpetuation of the privilege of using flesh meat on all days of abstinence granted in favor of those engaged in the crusades against the Moors, or who contributed money to assist the crusaders. In nearly all the Protestant churches of continental Europe, particularly in the Lutheran church, Lent is still a penitential season. In England Ercombert, who died in 664, made the observance of Lent obligatory in Kent. The church of England still keeps the Lenten fast on her calendar with appropriate services, as does the Protestant Episcopal church.—A curious old English custom followed in Lent was that of pelting a puppet called a Jack o' Lent, the origin of which is not explained. Ben Jonson alludes to it in his "Tale of a Tub":

—on an Ash Wednesday,  
When thou didst stand six weeks the Jack o' Lent  
For boys to hurl three throws a penny at thee.

In a ballad called "Ashton Stuff," found in a manuscript in the Ashmolean museum, occur the following verses:

Then Jake à Lent comes justlynge in,  
With the hedpeece of a herynge,

And saythe, repent yow of yower syn,  
For shama, syrs, leve yower awerynge:  
And to Palme Sunday doethe he ryde,  
With sprots and herryngs by hys syde,  
And makes an end of Lenton tyde!

The fourth Sunday of Lent is often termed Mid-Lent Sunday or Passion Sunday; it was formerly known as "Carl Sunday," and on that day beans or peas called "carlings" used to be given away or eaten. Thus an English translator (1607) gives the following passage from the *Quadragesimale Spirituale* (Paris, 1565): "After the sallad (eaten in Lent at the first service) we eat fried beanes, by which we understand confession. When we would have beanes well sooden, we lay them in steepe, for otherwise they will never seeth kindly. Therefore, if we purpose to mend our faults, it is not sufficient barely to confess them at all adventure, but we must let our confession lie in steepe in the water of meditation." In his "Colin Clout" Skelton writes:

In holy Lenton Season,  
Ye will neither Beanes nor Peason,  
But ye look to be let loose  
To a pigge or to a goose.

Lent is preceded in some countries by the dissipation of the carnival. (See CARNIVAL.) The day before Ash Wednesday is called Shrove Tuesday, because the faithful used then to confess and be shriven, in preparation for the fast. In the north of England Shrovetide is still called Fastingtide, Fastens, and Fastmass. (See HOLY WEEK, and GOOD FRIDAY.)

**LENTIL** (Lat. *lens*), an esculent seed produced by *ervum lens*, of the pea family, and used for food from the earliest times. The len-



Lentil (*Ervum lens*).

tils of Egypt used to be held in much esteem. It was a preparation of this diet which Esau exchanged for his birthright, under the name of "red pottage;" and according to Dr. Shaw, in his "Travels in Barbary," the lentils were dressed in the same manner as beans, dissolving into a

mass and making a pottage of a chocolate color. In Egypt and Syria the parched seeds are exposed for sale in the shops, and they are esteemed the best food to carry upon long journeys. On the continent of Europe its use is very common, especially by the Roman Catholics during Lent. The plant is slender and branching, with the leaves terminated by tendrils; it grows only 12 or 18 in. high, and bears small pea-like flowers in pairs, which are succeeded by pods containing from one to four round, flattened, doubly convex seeds. There are some half dozen varieties, of which the large lentil is the most productive and the common the best flavored. Considerable quantities are imported into this country, but their use is mainly confined to Europeans; lentil soup is a favorite dish with Germans. The cultivation of the lentil is very similar to that of the pea, requiring a dry, warm, sandy soil; it is sown early in May, broadcast if intended merely for fodder, but in drills if the ripe seeds are desired; as a green food for stock it is highly valued in Europe, but it has not obtained a place in our agriculture. Like other legumes, the lentil contains a great amount of nutriment, Einhoff finding in 100 parts 32.81 of starch and 37.32 of matter analogous to animal matter. The preparation sold as a food for children under the names of revalenta and ervalenta Arabica consists of lentil meal flavored with sugar and salt. Lentils are regarded as a highly nutritious and easily digestible food, but they must be deprived of their skins either before or after cooking, as these are indigestible and hurtful.

**LENTULUS**, the name of a patrician family, long prominent in ancient Roman history. **PUBLIUS LENTULUS SURA**, the chief associate of Catiline, was quæstor in 81 B. C., prætor in 75, consul in 71, and in the following year was ejected from the senate for his infamous life. Joining the conspiracy of Catiline, he became prætor again in 63, was left in command of the conspirators in the city when Catiline departed for Etruria, was detected and proved guilty by Cicero through the Allobroges, and was strangled in the Capitoline prison, Dec. 5, 63 B. C.

**LENZ, Jakob Michael Reinhold**, a German poet, born at Sesswegen, Livonia, Jan. 12, 1750, died in Moscow, May 24, 1792. He was the son of a clergyman, studied in Königsberg, and as a tutor of Russian nobles went to Strasburg, where he was an unsuccessful lover of Goethe's Friederike of Sesenheim. In 1776 he associated with Goethe, Herder, and Wieland at Weimar; but his aversion to the conventionalities of society put a speedy end to his residence there. He became insane, and ended his life in great misery. His writings, chiefly dramatic, edited by Tieck (3 vols., Berlin, 1828), reflect the "storm and pressure period" of German literature.

**LEO**, the name of twelve popes, of whom the following are the most important. **I. Leo I,**

**Saint**, surnamed the Great, born of Tuscan parents in Rome about 390, died there in November, 461. He was employed by Popes Zosimus, Celestine I., and Sixtus III. on the most important missions. In 418 he was sent to the churches of northern Africa to unite the bishops against the spread of the Pelagian doctrines; and he displayed great activity in combating the Nestorian heresy. When the dissensions between the imperial commanders in the West, Aëtius and Albinus, left Gaul and Italy exposed to the attacks of the barbarians, Leo was sent by the emperor Valentinian III. to appease the quarrel, and had just succeeded in his mission when Sixtus III. died in the summer of 440, and Leo was unanimously chosen his successor. His first efforts as pope were directed toward restoring harmony and discipline among the churches of Africa, annulling fraudulent episcopal elections in Gaul, enforcing celibacy among the clergy, and suppressing the immorality charged on the Manichæans of Italy. In 445 he held a council in Rome to judge the appeal of Celdionius, bishop of Besançon, who was declared innocent and restored to his see; and St. Hilary, archbishop of Arles, who had deposed him, was for a time deprived of his metropolitan jurisdiction. In Spain he approved of the execution of Priscillian, convicted of magic and immorality, and put to death by the usurper Maximus, and he procured the condemnation of Priscillianism by a national council of Spanish bishops. Eutyches, condemned for heresy at Constantinople in November, 448, made an appeal to Leo which was supported by the emperor Theodosius II. This led to the convocation at Ephesus, in 449, of what is known as the "robber synod," in which the partisans of Eutyches, protected by the imperial troops, excommunicated Leo, and caused or hastened the death of Flavian, patriarch of Constantinople. These violent proceedings were cancelled by the general council of Chalcedon in 451, over which Leo's legates presided, and in which his letter was accepted as the expression of orthodox doctrine. In 452, at the invasion of Italy by the Huns under Attila, the emperor Valentinian having taken refuge in Rome, and his general Aëtius having abandoned Italy to her fate, Leo with two senators went to meet Attila near Mantua, and persuaded him to accept a pecuniary ransom from the Romans, and to retire beyond the Danube. In 455, Genseric and an army of Vandals having come to Rome at the invitation of the empress Eudoxia, the mediation of Leo could only obtain a promise that the lives of the citizens should be spared, together with three churches, which served as an asylum while the rest of the city was sacked. All the treasures of Rome having been carried to Africa with her chief citizens, the pope devoted himself to redeeming the captives and relieving the manifold distress of his flock. He also used his influence with the court of Constantinople to quell the religious



troubles caused in Egypt and Syria by the partisans of Eutyches.—Besides a large collection of sermons, there remain 173 letters of St. Leo on ecclesiastical matters addressed to contemporary sovereigns, bishops, and councils. Quesnel attributed to him the treatise *De Vocatione Gentium*, considered by some to belong to St. Prosper, and by others to St. Ambrose. Of the numerous editions of his works, the principal are those by Pasquier Quesnel (2 vols. 4to, Paris, 1675), Cacciari (2 vols. fol., Rome, 1753-'5), and Ballerini (3 vols. fol., Verona, 1755-'7). See also Dumoulin, *Vie et religion de deux bons papes, Léon I. et Grégoire I.* (Paris, 1650); Maimbourg, *Histoire du pontificat de St. Léon* (1687); Arendt, *Leo der Grosse und seine Zeit* (Mentz, 1835); Perthel, *Pabst Leo's I. Leben und Lehren* (Jena, 1843); Saint-Chéron, *Histoire du pontificat de St. Léon le Grand et de son siècle* (2 vols., Paris, 1846). **II. Leo III., Saint**, born in Rome about 750, died there, June 11, 816. He was educated in the monastic school attached to the Lateran palace, was cardinal-priest of Santa Susanna, and distinguished for his learning and eloquence, when he succeeded Adrian I., Dec. 25, 795. He immediately wrote to Charlemagne to renew the relations which existed between the latter and Pope Adrian, confirmed the title of *patricius*, senator or protector of Rome, bestowed upon Charlemagne's father Pepin by Pope Stephen III., and received in return a portion of the spoils won from the Avars by Charlemagne. At the time of Leo's election Rome was visited by Offa, king of the Mercians, who increased the revenues of the English college founded at Rome by Ina (died 728), and which was supported by a tax originating with these princes, which afterward received the name of "Peter pence." On April 25, 799, while present on horseback at the solemn procession in honor of St. Mark, Leo was attacked by an armed band led by two priests, Paschal and Campolo, nephews of Adrian I., who, after attempting to put out his eyes and cut out his tongue, imprisoned him in a neighboring convent. Having been delivered by the citizens, he took refuge in Spoleto, and thence went to Paderborn, where Charlemagne received him with honor, and gave him a numerous escort of bishops, counts, and armed men to accompany him on his return to Rome. The two priests who had made the assault on him were then tried and banished to France. Toward the close of the year 800 Charlemagne, after expelling the Saracens from the Balearic islands, went to Rome, where a council of bishops examined the charges brought against Leo by the exiled assassins, and declared the pope's innocence. On Christmas day Charlemagne was anointed emperor of the West by Leo. In 804 the pope visited the emperor at Aix-la-Chapelle, and prevailed on him to restore the full liberty of canonical elections, to prevent those called *chorepiscopi* from exercising episcopal powers or conferring

holy orders, to forbid churchmen from bearing arms, and to enforce the obligation of residence for bishops. The council of Aix-la-Chapelle in 809 having approved the custom established in Spain and followed by the Frankish monks of Palestine, of inserting the words *Filioque* in the Nicene creed, the decision of the council was submitted in 810 to Leo, who advised the discontinuance of the custom. He had the Nicene creed engraved in Greek and Latin, without the addition *Filioque*, on silver tablets, which were hung up near the Confession of St. Peter. In 815 a new conspiracy was discovered, and its authors were put to death. The sentence and its hasty execution were censured by the new emperor Louis le Débonnaire. In 816, an earthquake having ruined several towns in Italy, and thrown down a church in Rome, Leo in order to propitiate the divine wrath established the solemn litanies and processions known as the Rogations. Leo III. is praised by his contemporary Anastasius the Librarian for his munificence in building and adorning churches. Thirteen letters of this pontiff are extant in Labbe's *Concilia*, vol. vii. Hermann Conring published his *Epistole ad Carolum Magnum* (4to, Helmstedt, 1647). **III. Leo IV., Saint**, born in Rome about 800, died there, July 17, 855. He was educated in the monastery of San Martino, became a member of the community, was selected by Gregory IV. as one of his domestic prelates, and created a cardinal by Sergius II. He was unanimously elected pope Jan. 30, 847, without the customary notice being sent to the emperor, because the city was threatened by Saracen pirates. They had just ravaged the environs of Rome, and sacked the basilicas of St. Paul without the wall and St. Peter on the Vatican, carrying away the silver and gold which decked St. Peter's tomb. Leo, aided by the emperor, enclosed the Vatican with fortifications. (See LEONINE CITY.) In 849, while the work was still in progress, the Saracens landed a great force at Ostia. The pope armed every man in Rome and the neighborhood, obtained auxiliary troops from Gaëta and Naples, and sallied forth at their head in his priestly robes. A fearful storm came to the aid of the Romans; the Saracen fleet was scattered or wrecked, and the invaders were utterly routed. The rich booty recovered by the victors helped the pope to complete the entire circuit of the walls of Rome. The city of Porto was also rebuilt by Leo for purposes of defence in 852, and peopled by a colony of Corsicans, whom the Saracens had driven from Bastia. On Dec. 8, 853, he held in Rome a council of 67 bishops, in which canons were enacted for the discipline of the clergy and the instruction of the people in the knowledge of gospel truth. Two letters of Leo's are extant in Labbe's *Concilia*, vol. viii. **IV. Leo X.** (GIOVANNI DE' MEDICI), born in Florence, Dec. 11, 1475, died in Rome, Dec. 1, 1521. He was the second son of Lorenzo the Magnificent, destined for the church

at his birth and before his eighth year appointed by Louis XI. of France abbot of Font-Douce, and by Pope Sixtus IV. abbot of Passignano and prothonotary apostolic. At 18 he was created cardinal by Innocent VIII., whose son, Francesco Cibo, had married in 1487 Madalena, Giovanni's sister. No pains were omitted by Lorenzo to make his son worthy of his rank in the church. He graduated in theology and canon law at the university of Pisa, assumed for the first time the insignia of the cardinalate March 9, 1492, and went immediately to Rome, whence he was recalled to Florence a few weeks afterward by the death of his father. He fixed his residence there as legate of the holy see, opposed the election of Alexander VI. in August, 1492, and then returned to Florence. In 1494 he and his brothers were expelled by the citizens, and after living five years an exile and fugitive, he quitted Italy in 1499, and visited Germany, the Netherlands, and France, seeking everywhere the acquaintance of the learned. He returned to Rome in 1503, and lived there in retirement, making his house the resort of the most distinguished artists and men of letters in Italy. On the accession of Julius II. he was employed in the most important affairs. In 1506 he was appointed governor of Perugia, and subsequently legate of Bologna and commander of the papal troops in league with Spain against the French in Italy. In this capacity he was present at the battle of Ravenna, April 11, 1512, and was taken prisoner, but allowed to escape. The French having been driven out of Lombardy, Cardinal de' Medici employed the Spanish arms to reinstate his family at Florence. He was elected to succeed Julius II., March 11, 1513, received priest's orders March 15, was consecrated bishop on the 17th, was crowned on the 19th, and took possession of the Lateran April 11. Louis XII., who had been excommunicated and whose kingdom had been laid under an interdict by Julius II., was more than ever bent on conquering Lombardy. In March, 1513, he had signed at Blois a treaty with the Venetians, by which they promised to aid him in obtaining possession of Milan. The new pope instantly formed a counter treaty with Henry VIII., signed at Mechlin April 5, to which the emperor Maximilian, Ferdinand of Aragon, and the Swiss cantons acceded, and which resulted in the defeat of the French at Novara, June 6. This warlike activity of Leo X. seemed in contradiction to the policy announced on the day after his election to King Sigismund I. of Poland, to whom he wrote to urge him to make peace with Albert of Brandenburg, alleging that he was sending legates to all Christian nations to dissuade them from making war on each other. Before his coronation, too, he chose as his secretaries the illustrious scholars Bembo and Sadoleto, and bestowed his first care on reconstructing the Roman gymnasium or university, founded by Eugenius IV., re-

vived and liberally endowed by Alexander VI., and neglected by the warlike Julius II. In 1514 it already counted 100 professors, the most eminent scientific body in Europe, teaching every branch of sacred and profane science, including medicinal botany for the first time. In 1513 Leo purchased on the Esquiline hill a large property on which he founded the Greek institute, and established a Greek press, encouraging at the same time the culture of all the oriental languages, and paying out of his own purse for the printing of Sante Pagnino's version of the Bible, and of Piero Valeriano's key to Egyptian hieroglyphics. He also enlarged the patronage extended to the fine arts by Julius II. He obtained the release from prison of the conspirators against his own family at Florence, called to Rome and protected there Piero Soderini their chief, as well as Machiavelli, and restored to favor and public life the Colonnas, disgraced under his predecessor. He reopened the fifth general council of Lateran, April 27, 1513, with great magnificence (see LATERAN, COUNCILS OF), and declared it to be his intention to continue its sessions until the establishment of a general peace among the princes of Christendom. He made his brother Giuliano de' Medici general of the papal armies, his nephew Lorenzo governor of Florence, and his cousin Cardinal Giulio de' Medici (afterward Clement VII.) archbishop of that city. At the same epoch King Emanuel of Portugal sent him a splendid embassy to offer him the first fruits of Albuquerque's conquests in the East Indies; and Leo in return conferred on Emanuel the investiture of the conquered countries. Louis XII. after the battle of Novara was reconciled with the pope, who induced him to become the ally and brother-in-law of Henry VIII., and agreed not to oppose by open force his pretensions to the duchy of Milan. Louis secretly pledged himself to expel the Spaniards from Naples; and a matrimonial alliance was arranged between the pope's brother Giuliano and Filiberta of Savoy, aunt of the duke d'Angoulême. The latter prince, on his accession as Francis I., Jan. 1, 1515, assumed the title of duke of Milan, and gained on Sept. 13 the memorable victory of Melegnano (Marignano). This was followed by a treaty with the pope, who gave up to Francis Parma and Piacenza, Bologna being annexed to the Papal States, and the authority of the Medici reestablished in Florence. Leo and Francis met in Bologna in December, 1515, and agreed upon a concordat, afterward promulgated in the Lateran council, March 16, 1517. By this the king repealed the pragmatic sanction of Bourges (1438), guaranteed to the pope the collection of annates and tithes, and obtained the right of nomination to all episcopal sees and principal benefices in France. Francis vainly interceded for the duke of Urbino, who, guilty of rebellion against Julius II. and Leo himself, had killed with his own hand in the open street Cardinal Alidori,

archbishop of Pavia. The duchy of Urbino was subsequently bestowed on Lorenzo de' Medici, the pope's nephew, after whose death it reverted to the church. Siena was also annexed; but the measures adopted for this purpose gave rise to a conspiracy against the life of the pontiff, in which Cardinal Petrucci, whose family were sovereigns of Siena, and several other members of the sacred college were implicated. Petrucci was strangled in prison, June 3, 1517, and the others were condemned to pay enormous fines. In order to bind the college of cardinals more securely to his person, Leo created 31 new cardinals, most of whom were Florentines. The treaty of Noyon, concluded between France and Spain, Aug. 13, 1516, was intended to be a definitive settlement of the affairs of northern and southern Italy, in direct opposition to the pope's policy. Leo endeavored to counteract this settlement by the treaty of London, Oct. 29. But the emperor Maximilian by becoming a party to both defeated Leo's purpose; while the treaty of Fribourg made by Francis I. with the Swiss cantons, Nov. 29, deprived the pope of his most faithful allies. During the treacherous peace which followed this settlement and the conspiracy of Petrucci, Leo and his cardinals displayed their taste for magnificence and the encouragement of literature and art. The council of the Lateran was closed with great solemnity in 1517; and a bull was published urging all Christian princes to form a league against the Turks, and granting indulgences to all who joined in the crusade, or contributed toward paying its expenses. The building of the new basilica of St. Peter's was pushed forward; and the lavish expenditure of the pope having exhausted his treasury, an indulgence was offered to all who would give money toward the construction. This occasioned the quarrel in Germany between the Augustinian monk Martin Luther and the Dominicans, and led step by step to the reformation. Leo, who looked upon the first movements of this great religious revolution as a quarrel between monks, who also admired Luther's genius and wished to conciliate him, summoned him, Aug. 7, 1518, to appear in Rome within 60 days; but irritated him by ordering the legate at the imperial court to examine him in Germany, and, if found heretical in doctrine and refractory, to send him a prisoner to Rome. The compromise effected by the conference of Augsburg only made Luther appeal from the pope misinformed to the pope better informed; and when Leo's bull of Nov. 9, 1518, defined the right of the Roman pontiff to grant indulgences and explained their nature, Luther appealed from the bull to a general council. At the solicitation of the kings of Hungary and Poland, whose dominions were continually threatened by the Turks, he sent the most eminent among his cardinals to the European courts to advise the formation of a common league against the foes of Christendom. He

submitted to the sovereigns the plan of a combined attack by land and sea against the Turkish empire, he himself promising to sail from Ancona with 100 armed vessels to join the allied fleets. At the same time he proclaimed a general truce for five years, which was accepted by the sovereigns; but nothing more than a defensive league was effected between England, France, and Spain, with the pope at its head, which served to check temporarily the advance of the Turks. Leo made a second effort to conciliate Luther, and a conciliatory letter from Luther was answered by a pacific one from Rome. But public theological discussions revived the zeal of the reformer, and a bull was at length issued, June 15, 1520, condemning his writings as heretical. This Luther burned publicly at Wittenberg, Dec. 10. In 1521 the cause of the American Indians was brought to Leo's tribunal by both Franciscans and Dominicans, the former endeavoring to justify the Spanish system of reducing them to slavery. Leo condemned the system, and employed his utmost endeavors to prevail on the king of Spain to repress it. In April, 1518, Leo gave his nephew Lorenzo, duke of Urbino, in marriage to a relative of the French king, and in return had to surrender the cities of Reggio and Modena. From these nuptials sprung Catharine de' Medici, queen of France. At the death of the emperor Maximilian, Jan. 12, 1519, Leo sent his own relative Cardinal Orsini to Francis I. to urge him to oppose the election of Charles of Spain, and, if possible, to secure the nomination of some inferior German prince. Orsini failed in his main purpose; Francis used his utmost endeavors and even open bribery, but only to secure the imperial crown for himself. Charles V., however, was elected emperor, June 28, and immediately demanded the pope's permission, as the public jurisprudence of the age required, to retain his Spanish possessions together with the imperial title. The pope having assented in spite of the remonstrances of the French king, the latter determined on war. It appears certain that Leo resolved at this juncture to execute Julius II.'s project of expelling from Italy both French and Spaniards, by taking advantage of the dissensions between the two monarchs. He sent 150,000 gold crowns to Switzerland, and obtained a body of 6,000 Swiss auxiliaries; proposed to Francis I. to unite with him in an attack upon the kingdom of Naples; stipulating that Gaëta and the whole Neapolitan territory north of the Garigliano should be given to the church, that the remainder should be held for the second son of Francis, then an infant, and that an apostolic nuncio should govern for him till his majority. Francis meanwhile permitted the pope's Swiss auxiliaries to pass through the Milanese to the Romagna and the march of Ancona. Perugia was at this time forcibly annexed to the Papal States, and an attempt was made on Ferrara. Francis, divining the

pope's real design, broke off the pending negotiations, and Leo openly united his forces with those of the emperor for the avowed purpose of wresting from the French the duchy of Milan and Genoa. By a treaty concluded with Charles V., May 8, 1521, Francesco Sforza was to be restored to his dominions, Parma and Piacenza were to be given back to the church, and the emperor was to aid the pope in annexing Ferrara, and to bestow the duchy of Cività di Penna in the kingdom of Naples on the son of the late duke of Urbino. The treaty was not made public till July 8. Prospero Colonna with the Spaniards from Naples joined the papal forces at Bologna, crossed the Po at Casalmaggiore, and joined the Swiss, whose countrymen in the French service now deserted to the papal standard. After a series of successes the allied army entered Milan Nov. 19; Parma and Piacenza were next occupied; but the duke of Ferrara defended his dominions to the last extremity against the spiritual and temporal arms of the pontiff. Leo received the intelligence of the capture of Milan and the recovery of Parma and Piacenza on Nov. 23. Amid the rejoicings consequent on these events he felt a sudden indisposition on the 24th, which excited no alarm, and died unexpectedly on Dec. 1, it is said without the sacraments of the church. His death has been by some writers attributed to poison; but nothing certain about its cause or manner is found in authentic contemporary accounts.—The character of Leo has been judged with more prejudice and discrepancy than that of almost any other person known in history. He has been accused of political insincerity, of adding treachery to injustice in his annexation of neighboring states, of an inordinate anxiety for the aggrandizement of his family, and of many failings which, however readily pardoned in a great prince, become odious in a Christian priest. But whatever estimate we form of his foreign policy, it must be acknowledged that he governed his own subjects with wisdom and justice, and his reign was long gratefully remembered by the Romans as an era of happiness and prosperity. Engaging and affable in manners, gay or dignified as occasion demanded, and gifted with great powers of conversation, he charmed all with whom he came in contact. His private life both before and after his elevation to the throne was chaste and decorous. He was generous to excess, magnificent in his tastes, passionately fond of the chase, but temperate in the pleasures of the table. Though not a profound scholar, and accused of neglecting the studies best fitted to his station, he was well versed in the lighter branches of literature and a proficient in the art of music. He delighted above all things in the society of artists, poets, and learned men. He increased the Vatican library, and restored the celebrated library of his family (the Laurentian at Florence), which had been plundered and dispersed at the time of their expulsion.

He employed Michel Angelo and Raphael in the execution of some of their greatest works. His munificence might well entitle the reign of Leo X. to rank as the golden age of Italian art and letters. "Happy is it for the world," says Roscoe, "when the pursuits of such individuals, instead of being devoted, through blind ambition, to the subjugation or destruction of the human race, are directed toward those beneficent and generous ends which, amid all his avocations, Leo the Tenth appears to have kept continually in view." See Audin, *Histoire de Léon X.* (2 vols. 8vo, Paris, 1844), and Roscoe's "Life and Pontificate of Leo X." (6th ed. revised, 2 vols. 8vo, London, 1853). **V. Leo XII.** (ANNIBALE DELLA GENGA), born in the territory of Spoleto, Aug. 2, 1760, died Feb. 10, 1829. Before his elevation to the pontificate he was papal nuncio at several German courts, and was sent to France on a special mission by Pius VII., whom he succeeded in the papacy, Sept. 28, 1823. He governed the church with a firmness which involved him in disputes with France and Austria, and administered the affairs of his temporal dominions with great zeal for the good of his subjects. He exerted himself to suppress brigandage and mendicity, promote education and literature, and suppress secret societies. He published a jubilee for the year 1825, and in a circular letter to the Christian nations attacked Bible societies. He entered into negotiations with the republics of South America for the purpose of filling up the many sees left vacant during their wars with Spain; organized in a most efficient manner the Sapienza university in Rome, and regulated its five faculties of theology, law, medicine, philosophy, and philology; increased the number of professors, and raised their salaries. He manifested the design of reforming thoroughly church and state, and published in October, 1824, a *motu proprio* or decree reorganizing the administration of the Papal States. He corrected abuses in the convents and monasteries of Rome, and established order and security by means of a good police.

**LEO I., Flavius**, surnamed the Thracian and the Great, a Byzantine emperor, born in Thrace about A. D. 400, died in January, 474. At the death of Marcian in 457 he was only a military tribune; but being proclaimed emperor by the soldiers, the choice was confirmed by the senate, and he was crowned by the patriarch Anatolius, this being the first instance of a prince receiving his crown from the hands of a bishop. He continued the measures of his predecessor against the Eutychians in Alexandria, successfully encountering the opposition of his minister, the Arian chief Aspar, by whose influence he had been raised to the throne. In 466 the Huns invaded Dacia and threatened the eastern empire, but were defeated by the generals of Leo, their principal chief Dengizec, a son of Attila, being killed. In 468 he concerted with Anthemius, the emperor of the West, an ex-

pedition against Genseric, king of the Vandals in Africa. Under the command of Basiliscus more than 1,000 ships, each with 100 men, came to land near Carthage, but were attacked by night with fire ships, and the whole fleet was destroyed or dispersed. This disastrous result was charged upon Aspar, who with one of his sons escaped from a popular tumult only to be assassinated by a band of the emperor's body guard within the precincts of the palace. The Arian followers of Aspar encouraged the intrigues of Ricimer in the West, and incited the Goths to invade Thrace, and for two years to threaten Constantinople. Among the extraordinary events of this reign were the destruction of Antioch by an earthquake (458), a conflagration in Constantinople (465), immense and destructive inundations (469), and an eruption of Vesuvius (472), which, according to all the historians, was not only felt at Constantinople, but caused showers of ashes which covered the roofs of houses with a coat three inches thick.

**LEO III., Flavius**, surnamed the Isaurian, a Byzantine emperor, born in Isauria about 680, died June 18, 741. The son of a farmer who emigrated from Asia Minor to Thrace, he joined the army under Justinian II., was rapidly promoted, and in 713 was appointed by Anastasius II. to the supreme command of the troops in Asia, where he held the field against the Saracens. When in 716 the crown was seized by Theodosius III., Leo declared him a usurper, outwitted and avoided the Arab general Muslima, marched upon Constantinople, forced him to resign (March, 718), and became himself master of the empire. The Saracens immediately appeared with an immense army and fleet before Constantinople. This siege, under Omar II., the third by the Saracens, lasted two years, and so powerful were the Mohammedan armaments that the provinces expected the downfall of Leo, the western kingdoms heard that a caliph had ascended the Byzantine throne, and two schemes of rebellion were plotted, which were quickly suppressed when the triumph of the emperor was known. The Arab fleet was routed in two engagements, and partially consumed by the Greek fire, and few of the ships regained the harbors of Syria. In 726 Leo promulgated an edict for the removal of images from all the churches of the empire, and thus inaugurated the party of the iconoclasts, and a conflict of nearly 120 years. He was opposed by Germanus, patriarch of Constantinople, John the Damascene, and John Chrysorrhous in the East, and by Popes Gregory II. and III. in the West. The iconoclasts were condemned in 732 by a council assembled at Rome; an expedition sent by the emperor into Italy to reduce the cities opposed to the edict failed in its object, and the exarchate of Ravenna was transferred from the Greeks to the Lombards (734). In the East, there was a rebellion in the Peloponnesus and the Cyclades, and a re-

volt in the capital, the latter of which was quelled only after much bloodshed. The professors in the schools of Constantinople favored the use of images, and the emperor is said to have therefore ordered the library of St. Sophia to be burned. It is more probable, however, that this library of 36,000 volumes was accidentally destroyed in some conflagration. After the check which his forces experienced in Italy, he transferred Greece and Illyria from the spiritual authority of the popes to that of the patriarchs of Constantinople. The latter years of his reign were occupied with violent wars with the Saracens. An adventurer, who claimed to be Tiberius, a son of Justinian II., was supported by the caliph, and made his entry into Jerusalem in the garb of a Roman emperor. In 739 the Arab general Solymán invaded the Roman territories with 90,000 men, in three divisions, but retreated into Syria after the defeat of one of the bodies in a pitched battle in Phrygia. In 740 an earthquake caused calamities throughout the empire, demolishing a part of the walls of Constantinople, and destroying whole towns in Thrace and Egypt.

**LEO V., Flavius**, surnamed the Armenian, a Byzantine emperor, reigned from 813 to 820. He was of noble Armenian descent, distinguished himself as a general under Nicephorus I. (802-811), was exiled for treachery, but soon recalled by Michael I., and appointed commander of the troops in Asia. Michael was chiefly unpopular as the husband of the masculine and presuming Procopia, and his downfall and the elevation of Leo had been foretold by an Asiatic prophetess. In 813 Leo and the emperor led an expedition against the Bulgarians, and were defeated in a battle near Adrianople. Michael withdrew to Constantinople, leaving a disaffected army under the command of Leo, who was the secret cause of the defeat, and whose friends now persuaded the soldiers to proclaim him emperor. The rebel army marched toward the capital, and to avoid civil war Michael resigned to the conspirators the keys of the city and the palace, and retired to a convent. The Bulgarians immediately appeared before Constantinople, desolated its suburbs, captured Adrianople, and reduced Thrace to a desert, but suffered a terrible defeat by Leo at Mesembria in 814. In 815 he invaded their territory, obtained a truce for 30 years, and by his fierce onsets left such an impression on these hereditary enemies of the Byzantine empire that they remained quiet during 74 years. Educated in a camp, he reformed the civil government by introducing into it the strictness of military discipline, and his incessant oversight and formidable punishments improved the administration both in the capital and the provinces. He protected the iconoclasts, and his severity against the advocates of images created numerous enemies. Michael the Stammerer had contributed largely to his elevation, and had been his staunch ad-



herent, but after repeated warnings was found guilty of treason, and was sentenced to death. On the day appointed for his execution a band of priests and chanters was admitted into the palatial chapel to sing matins. A body of conspirators, friends of Michael, mingled with this procession, in the ecclesiastical habit, with swords under their robes, and at a given signal they rushed upon the emperor, who perished at the altar, after bravely defending himself with the great cross.

**LEO VI., Flavius**, surnamed the Philosopher, a Byzantine emperor, born about 865, ascended the throne in 886, died in 911. He was associated with his father Basil I. in the government two years before he succeeded him. Narrowly escaping from a false accusation of parricide made by the minister Santabaren and the patriarch Photius, he began his reign by banishing one of them and deposing the other. From 887 to 891 he warred against the Saracens in Asia Minor and Italy. The mismanagement of the prime minister Stylianus, who disregarded the privileges of Bulgarian merchants, occasioned a severe war with that people, which Leo terminated in 894 by involving the Bulgarians in hostilities with the Hungarians. The inactivity of the emperor exposed him to a series of conspiracies, and invited new attacks by the Saracens, who in 904 captured and plundered Thessalonica. In 911 they defeated the Greek fleet near Samos. Leo combined the legislative and executive powers in his own person, and extinguished the last remains of the authority of the senate. He was excluded from the communion of the faithful on account of his fourth nuptials, the Greek church tolerating only a second marriage. His title of Philosopher he received for having written several works on theological and profane subjects. The "Basiliacs," or imperial constitutions, being a Greek translation and revision of Justinian's *Corpus Juris*, with the addition of subsequent constitutions, were begun under Basil I., and completed under Leo and Constantine Porphyrogenitus. The principal writings attributed to Leo are 33 orations, chiefly on the theological subjects, an important treatise on military tactics, and a work on "Oracles," in which the fates of the empire are foretold by the arts of astrology and divination.

**LEO, André**, a French novelist (who adopted the Christian names of her twins as her *nom de plume*, her real name being **LÉONIE CHAMPEIX**), born at Champagné, Vienne, about 1832. She is the daughter of M. Béra, a naval officer, and she married in 1851 Pierre Grégoire Champseix, a socialistic publicist, who then lived in exile at Lausanne, and who died in Paris, Dec. 4, 1863. Her principal works are: *Le mariage scandaleux* (1863); *Une vieille fille et les deux filles de M. Plichon* (1864); *Le divorce*, and *Jacques Galleron* (1865). She also appeared as a lecturer on social questions and on woman's rights, and during the siege of Paris in 1870-'71 she was one of the most im-

passioned speakers in political clubs. In conjunction with Mme. Jaclard, wife of a member of the commune, she founded in March, 1871, *La Sociale* newspaper. She was under arrest for a short time at Versailles after the overthrow of the commune, and subsequently went to Switzerland, where she took a prominent part in the meetings of the internationale.

**LEO, Heinrich**, a German historian, born in Rudolstadt, March 19, 1799. He was educated at Breslau and Jena, and went to Berlin in 1822, where he was an enthusiastic disciple of Hegel. In 1824 he published *Entwicklung der Verfassung der lombardischen Städte*. In 1830 he was elected professor of history in the university of Halle, which post he still held in 1874. In 1863 he was made perpetual member of the Prussian house of lords. In early life he vigorously defended Hegelianism and political liberalism, and in later years as earnestly opposed them. His principal controversial writings against liberal tendencies are: *Herr Dr. Diesterweg und die deutschen Universitäten* (1836); *Sendschreiben an Görres* (1838); *Die Hegelingen* (1838); and *Signatur Temporis* (1849). He has also written several works pertaining to Germanic and Celtic antiquities. He has contributed largely to the *Evangelische Kirchenzeitung* and other periodicals. Among his more important historical works are: *Handbuch der Geschichte des Mittelalters* (1830); *Geschichte der italienischen Staaten* (5 vols., 1829-'30); *Zwölf Bücher niederländischer Geschichte* (2 vols., 1832-'5); *Lehrbuch der Universalgeschichte* (3d ed., 6 vols., 1849-'53); *Leitfaden für den Unterricht in der Universalgeschichte* (4 vols., 1838-'40); and *Vorlesungen über die Geschichte des deutschen Volks und Reichs* (5 vols., 1854-'67).

**LEO AFRICANUS** (originally **AL-HASSAN IBN MOHAMMED**), a Moorish traveller, born in Granada, Spain, about 1485, died about 1526. While he was a child, his parents removed to Africa, and settled at Fez, then a magnificent Mohammedan city. At the age of 16 he accompanied his uncle on a mission to Timbuctoo, and remained there four years. Afterward he explored various parts of the kingdoms of Fez and Morocco, and journeyed among the wild Arab tribes of the desert. In 1513 he visited the kingdoms of Tlemcen and Algiers. On his return from this journey, which extended to Tunis and the desert of Barca, he went to Timbuctoo for the second time, and thence proceeded 400 miles southward as far as the city of Gago. Thence turning to the eastward, he traversed Bornoo and Nubia, and visited the ruins of Thebes. From Egypt he travelled into Turkey, Persia, and other oriental countries, but we have no narrative of his adventures there. Returning by sea from Constantinople, he was captured by Christian corsairs and carried to Rome in 1517. Here he was presented to Pope Leo X., who bestowed upon him a handsome pension, had him instructed in the principles of Christianity, and gave him

his own name. From this time he resided chiefly at Rome, and having mastered the Italian language was made professor of Arabic. Here he wrote his famous description of Africa, composed in Arabic, and after his death published in Italian. Ramusio, who issued this version in his *Raccolta*, asserts that he died at Rome; but Widmanstadt, a German orientalist of the 16th century, states that after the death of his patron he returned to Tunis, where he again embraced the Mohammedan faith. The merit of his great work on Africa has been universally acknowledged, and Ramusio remarks that no previous writer has given so accurate a description of that part of the world. The best Latin version is that of the Elzevirs (1632).

**LEOBEN**, a town of Austria, in the province of Styria, on the Mur, and on the Vienna and Trieste railway, 10 m. W. S. W. of Bruck; pop. in 1870, 5,091. The inhabitants are mostly engaged in mining and forging iron, and it is the seat of a famous school of mines. The preliminary treaty between the French republic and Austria, which terminated Napoleon's second Italian campaign, and was followed by the peace of Campo Formio, was concluded here, April 18, 1797.

**LEOBSCHÜTZ**, a town of Prussia, in the province of Silesia, capital of the mediatised principality of Jägerndorf, which belongs to the prince of Liechtenstein, 34 m. S. of Oppeln; pop. in 1871, 10,689. It has a castle, four churches, and a gymnasium. There is an active trade in grain and flax, and 2,000 persons are employed in woollen knitting.

**LEOCHARES**, an Athenian sculptor, who flourished about the middle of the 4th century B. C. He was one of the artists employed by Artemisia of Caria on the tomb of her husband Mausolus. He was also one of those engaged by Philip of Macedon to execute memorials of his victory at Chæronea; but his masterpiece was his bronze statue of the "Abduction of Ganymede by the Bird of Jove," of which the best extant copy is at Rome. His statue of "Zeus Ceraunius" was also very celebrated.

**LEOMINSTER**, a borough of England, in Herefordshire, on the Lugg, 13 m. N. N. W. of Hereford, on the railway to Shrewsbury; pop. in 1871, 5,865. Here the Leominster canal, which is 10 m. long and issues from the Severn at Stourport, enters the Lugg. It has a grammar school, an ancient church, and a house of industry. Among the principal manufactures are leather, gloves, and hats.

**LEOMINSTER**, a town of Worcester co., Massachusetts, on the Nashua river, and on the Fitchburg and the Boston, Clinton, and Fitchburg railroads, 38 m. W. N. W. of Boston; pop. in 1870, 3,984. It is the chief seat of the comb manufacture of the state, and contains also paper and piano factories, two large cabinet shops, an extensive manufactory of children's carriages, a national bank, 17 public schools,

including a high school, a weekly newspaper, and five churches.

**LEON. I.** A N. county of Florida, bordering on Georgia, and bounded W. by Ockloconee river; area, 900 sq. m.; pop. in 1870, 15,236, of whom 12,341 were colored. It has an undulating surface and productive soil. It is traversed by the Jacksonville, Pensacola, and Mobile railroad and its branch to St. Marks. The chief productions in 1870 were 258,432 bushels of Indian corn, 34,035 of sweet potatoes, 6,518 bales of cotton, 43 hogsheads of sugar, and 27,099 gallons of molasses. There were 427 horses, 1,296 mules and asses, 1,625 milch cows, 3,919 other cattle, and 6,299 swine; 3 saw mills, and 1 railroad repair shop. Capital, Tallahassee, which is also the capital of the state. **II.** An E. central county of Texas, bounded E. by Trinity river, and W. by the Navasoto; area, 1,100 sq. m.; pop. in 1870, 6,523, of whom 2,708 were colored. The soil on the uplands is a sandy loam, and in the bottoms a rich black loam. The chief productions in 1870 were 160,906 bushels of Indian corn, 24,505 of sweet potatoes, 44,998 lbs. of butter, and 4,897 bales of cotton. There were 2,405 horses, 5,263 milch cows, 1,414 working oxen, 18,041 other cattle, 1,116 sheep, and 19,512 swine. Capital Leona.

**LEON. I.** A former kingdom of Spain, now mainly divided into the provinces of Leon, Zamora, and Salamanca (area, 15,240 sq. m.; pop. in 1870, 881,940), bounded N. by Asturias, E. by Old Castile, S. by Estremadura, and W. by Portugal and Galicia. The principal rivers are the Douro and its tributaries, but a small portion of the N. W. part is drained by affluents of the Minho. The climate is mild in spring, hot in summer, and excessively cold in winter. Leon was anciently a part of the Roman province of Hispania Tarraconensis. After the destruction of the Gothic monarchy by the Arabs in the beginning of the 8th century the foundations of the kingdom of Leon were laid by Pelayo and Alfonso I. of Asturias, but Ordoño II. (913-'23) was the first to assume the title of king. In the 11th century it was united to Old Castile, and after a short separation reunited in the 13th. (See SPAIN.) **II.** A province of Spain, comprising the N. part of the ancient kingdom, bordering on the provinces of Oviedo, Palencia, Valladolid, Zamora, Orense, and Lugo; area, 6,166 sq. m.; pop. in 1870, 350,092. The N. and W. parts are rugged and mountainous, but in the E. are wide undulating plains, well adapted for agriculture, where wheat, maize, hemp, and flax are produced abundantly, and the vine is successfully cultivated. Iron, lead, antimony, coal, and marble are found in the mountains, but iron only is mined to any extent. There are few manufactures and little trade. The principal towns are Leon, the capital, Astorga, and Almansa. **III.** A city, capital of the province, at the junction of the Torio with the Bernesga, 180 m. N. N. W. of Madrid; pop. about 10,000. It is built

on the slope of a hill, which is crowned by the cathedral of Santa Maria de Regla, a noble Gothic edifice, originally founded in the 12th century. The town is surrounded by an octagonal wall, with 11 gates. The streets are generally narrow and irregular, but a few of them are handsome, and there are several public squares ornamented with fountains. Among the noteworthy public buildings are the church of San Isidoro, the convent of San Marcos de Leon, the town house, court house, episcopal palace, palace of the civil governor, and several hospitals. The manufactures are linen goods, leather, hats, and earthenware. Leon was founded by the Romans, who called it Legio, from the seventh legion, quartered there in the time of Augustus.

**LEON**, a city of Mexico, in the state of Guanajuato, capital of a district of the same name, on the right bank of the Rio Torbio, 100 m. N. W. of Mexico; pop. about 100,000 (second only to that of the capital). It stands in a fertile valley about 6,000 ft. above the sea, has good streets, and is generally well built. In the principal square, little inferior to any other in the republic, stand the old governor's palace, the handsome parish church, and a picturesque arcade with numerous fine shops. There are several other churches, three convents, a hospital, and a Latin and several primary schools. This city, one of the most flourishing and industrious in Mexico, has an extensive commerce in wheat and other grains. Some cotton and woollen stuffs are manufactured, but the chief industry is tanning.—Leon was founded in 1576, and made a city in 1836; but its commercial importance does not date beyond 1855, about which time it became the chief entrepot of the fertile region of the Bajío.

**LEON**, a city of Nicaragua, in the plain and capital of the department of the same name, 53 m. N. W. of Managua; pop. about 25,000. The streets are good, and some are paved and lighted; the houses are mostly of one story; the public edifices are numerous and spacious, but not remarkably handsome. The cathedral, from the tower of which are visible the 13 volcanoes of the Sierra de los Marrabios, though occupying an entire block, is less imposing than the churches of Calvary and La Merced; besides these there are 12 other churches. In the principal square are the old and new episcopal palaces, the old government house, university, and barracks. The antique convents of La Merced and La Releccion are converted into public offices, and a third into a hospital. A ravine, separating Guadalupe from the city proper, is crossed by a grand bridge, and other bridges were to be completed in 1874. In the surrounding country, which is very picturesque, mineral and thermal springs abound; and good roads lead from the city in every direction. Some dressed leather and cutlery are manufactured, and a few articles are exported through the port of Corinto on the Pacific.—Leon was founded in 1523 by Francisco F. de Cordoba,

on the W. shore of Lake Managua; but a series of calamities necessitated its transfer in 1610 to its present site, adjoining the ancient Indian village Subtiaba, which, with 6,000 inhabitants, and forming a distinct municipality, is separated from it by a single street. In 1823, 1,000 houses were burned in one night. The ruins of Old Leon are still visible.

**LEON, Isla de.** See CADIZ.

**LEON, Ponce de.** See PONCE DE LEON.

**LEONARDO DA PISA**, or **Leonardo Bonacci** or **Bonacci**, an Italian mathematician, born in Pisa about 1170; the year of his death is unknown. He is also called **FIBONACCI**, an abbreviation of *Filius Bonacci*. Little is known of him beyond what can be gathered from his mathematical works. His father placed him when very young in charge of a master who taught him the Arabic (or, as he calls it, the Indian) system of arithmetic, and he seems to have devoted the greater part of his life to the study of that science. Though the Arabic system was known in Europe previous to the time of Bonacci, yet he greatly extended that knowledge, and according to some he was the first to introduce algebra into Europe. He travelled in Egypt, Syria, and other countries, for the purpose of learning the different systems of arithmetic in use, and came to the conclusion that the Arabic or Indian method surpassed all others. His principal work is *Liber Abaci*, the word *abacus*, the name of a well known instrument used in calculation, being employed by him, in accordance with the custom of his time, to denote arithmetic in its most general sense. He was also the author of works on the Diophantine analysis and geometry, all of which give evidence of great mathematical genius. A splendid edition of the *Liber Abaci* was published at Rome in 1857, edited by B. Boncompagni, to whom the modern world is indebted for its knowledge of the works of Bonacci.

**LEONARDO DA VINCI.** See VINCI.

**LEONHARD, Karl César von**, a German geologist, born at Rumpelheim, near Hanau, Sept. 12, 1779, died in Heidelberg, Jan. 23, 1862. He was educated at Marburg and Göttingen, was employed in making several scientific journeys in different parts of Germany, and until 1814 held important offices in the administration of the principality of Hanau. Retiring from the service of the state to devote himself exclusively to study, he became in 1816 member of the Bavarian academy of sciences, and in 1818 professor of mineralogy and geology in the university of Heidelberg. His works in this department of science are very numerous, the latest being *Grundzüge der Mineralogie* (2d ed., 1860). From 1830 to 1858 he edited, in conjunction with Bronn, the *Jahrbuch für Mineralogie, Geognosie, Geologie und Petrefactenkunde*.—His son **GUSTAV**, born in Munich, Nov. 22, 1816, is professor in the university of Heidelberg, and has published several works upon mineralogy and geology, among which are *Die Mineralien Badens nach*

*ihrem Vorkommen* (2d ed., 1855), and *Grundzüge der Geognosie und Geologie* (2d ed., 1863).

**LEONIDAS**, king of Sparta, son of King Anaxandrides, and the 17th of the family of the Agides, killed at the battle of Thermopylæ, 480 B. C. He married Gorgo, daughter of his half brother Cleomenes, whom he succeeded as king in 491. When Athens and Sparta resolved to resist the invasion of Xerxes, Leonidas led the Spartan forces, and gained immortal glory, fighting and falling heroically with his chosen band. (See THERMOPYLÆ.)

**LEONINE CITY** (*Città Leonina*, and *Borgo*), the name given to that portion of Rome comprising the Vatican basilica and palace with the surrounding suburb, which Leo IV. (847-'55) enclosed with a wall. In the time of Leo III. (795-816) the frequent descents made by the Saracens on the coast of Italy inspired that pontiff with the design of securing against their attacks the churches and religious establishments outside the walls of Rome. Shortly before his accession to the pontificate the Saracens ascended the Tiber and plundered the basilica of St. Peter on the Vatican and that of St. Paul without the wall. Leo III. having informed the emperor Lothaire of this, the latter encouraged him to enclose these churches within the circuit of the walls, and sent large contributions in money from himself and his brothers for that purpose. Leo consulted the Romans, called in the peasants from the Campagna, and labored for four years (848-'52) in constructing the fortifications round the Vatican and the adjoining suburb, which he connected with the city. A tax was also levied on the entire duchy of Rome to defray the cost of the work. This part of Rome was hence called the Leonine City. It was still further fortified and embellished by Nicholas V. (1447-'55). It was the district inhabited by the Anglo-Saxon pilgrims during the early ages; hence the name of Sassia applied to it afterward. It also contains the Giraud palace, built by Bramante, which was the residence of the English ambassador before the reformation.

**LEOPARD** (*felis leopardus*, Linn.), a carnivorous mammal of Africa and India, often confounded with the African panther (*F. pardus*, Linn.), but of smaller size, paler yellow color, and with more numerous rows of spots. It is very graceful, slender, and active, the body being about 38 in. long, the tail 27, and the height 26; the ground color of the fur is tawny yellow, whitish below, the sides and back with numerous circles formed of from three to five spots of black; the head, fore quarter, and limbs marked with irregularly shaped spots; the color within the circles being darker renders them more distinct; according to F. Cuvier, ten of these ringed spots can be counted in a perpendicular line from the back to the under parts. The leopard inhabits thick forests, preying upon antelopes, deer, and mammals of similar size, and even sheep, hares, and wild and domestic fowls; being an excellent climber,

it resorts to trees in pursuit of game or for safety; it is taken in traps, or shot from trees into which it has been pursued by dogs. It is frequently seen in captivity, and occasionally breeds in confinement, being gravid nine weeks, and the young born blind. This animal is con-



*Felis leopardus*.

sidered by many authorities as the same with the panther, and by equally good ones as distinct. (See PANTHER.)—The hunting leopard of Africa (*felis jubata*, Schreb.), which Wagler has elevated to a genus *cynailurus*, is a very interesting animal, having the colors and appearance of the larger spotted cats, and yet with a form and a susceptibility of being trained like the dog, so much so that Cuvier calls it a canine cat. The color is bright tawny yellow, covered with full, round, black spots equally distributed; there is a mane of longer hair on the neck; the legs are longer than in the



African Hunting Leopard (*Felis jubata*).

leopard, and the claws are not retractile; the length is 3½ ft. With the strength, suppleness, teeth, and powerful jaws of the cats, it wants their sharp claws and ferocious disposition; it is easily tamed, and is trained to chase deer like a hound; the hair has a crisp-

ness like that of the dog. This animal, called *chetah* and *guepard*, performs among mammals the part of the falcons among birds; its natural instinct is to pursue game, and the reward of a portion induces it to yield the rest to the master. In Africa the hunting leopard is valued only for the skin, which is worn by persons of distinction and commands a high price. An Asiatic variety (*C. venaticus*, Griff.), which is maneless, has been used from very early periods, especially in the Mogul empire, for hunting purposes; it is said that some of the emperors went to the field accompanied by 1,000 of these leopards; this sport is now confined to India and Persia. The leopards are so tame that they are led in a leash like greyhounds, with eyes covered; on approaching the game, they are unhooded and let free, and very soon pull down the victim, prostrating it by a blow of the paw, and sucking the blood from the throat. Their disposition is so gentle that they live amicably with domestic animals and with children, purring when caressed. This animal forms a connecting link between the dogs and cats.

**LEOPARDI**, Giacomo, count, an Italian poet, born at Recanati, near Ancona, June 29, 1798, died near Naples, June 14, 1837. He was the son of Count Mondaldi Leopardi and the marchioness Adelaide Antici. Though bodily feeble and sickly, he made surprising progress in his early studies. At the age of 16 he wrote a commentary on Porphyry's "Life of Plotinus," and about the same time a dissertation on the life and writings of the principal rhetoricians of the 2d century, of which Cardinal Mai availed himself in preparing his edition of the "Epistles of Fronto." These and many of his other writings remain unpublished. At the age of 20 he was celebrated throughout Italy for the eloquence and energy of his burning patriotic strains, noble passion, and despair. In 1819 his sight was so much impaired by severe studies that he was forbidden to read, and about the same time he went on account of ill health to Rome, where he became acquainted with Niebuhr and with Bunsen, who afterward proposed to write his memoirs. As a critic Leopardi ranks with the most eminent of modern Italy. Of his poems, *Il sabato del villaggio* and *La sera del dì di festa* are remarkable for their truth to nature, and their chaste and beautiful style; his ode "To Italy" is the most widely known. The best complete edition of his works is that published at Florence in 1845. His *Saggio sopra gli errori popolari degli antichi*, written in 1815, was edited by Prospero Vane, and published in 1846; and a selection of his correspondence (*Epistolario*) appeared in 1849.

**LEOPOL**. See LEMBERG.

**LEOPOLD I.**, emperor of Germany, born June 9, 1640, died in Vienna, May 5, 1705. He was the fourth son of the emperor Ferdinand III., of the house of Hapsburg, and of Maria Anna of Spain, and was educated for the church,

when the death of his brothers made him heir to the throne of his father. Previous to the death of the latter in 1657, Leopold had been crowned king of Hungary; but the possession of this country could be secured only by decisive victories over the Turks, who held a large part of it, and also regarded themselves as the suzerains of Transylvania. The war having been renewed, Montecuculi won the great battle of St. Gothard on the Raab, Aug. 1, 1664; but this was followed by a peace which the Hungarian partisans of the emperor regarded as ignominious. This and many other grievances led to a conspiracy headed by Peter Zrinyi, Frangepan, and other Hungarian magnates, which being discovered was punished by the execution of the principal leaders at Neustadt near Vienna (1671). This was followed by the great insurrection under Tökölyi, and in 1683 by the Turkish invasion of Austria under Kara Mustapha. Leopold fled from Vienna, but John Sobieski's great victory saved his capital and thrones. Sobieski, Louis of Baden, and afterward Prince Eugene, continued the work of deliverance from the Turks. Buda was retaken after a memorable siege in 1686, and the victories at Zalankevény (1691) and Zenta (1697) led to the peace of Carlovitz (1699), which also secured the possession of Transylvania. But neither the wholesale executions of Hungarian patriots by the so-called "bloody tribunal" of Caraffa at Eperies, nor the acquiescence of the diet of Presburg in the proposition to make the male line of the Hapsburgs hereditary in Hungary (1687), could make peace permanent in that long distracted country; and Leopold, who also had to wage three times protracted wars against Louis XIV., the first two of which were terminated by the treaties of Nimeguen (1678) and Ryswick (1697), bequeathed to his eldest son and successor Joseph I. not only the war of the Spanish succession, commenced in 1701, but also the great Hungarian insurrection under Francis Rákóczy. Both of these, though the battle of Blenheim (1704) had inaugurated before his death the series of Marlborough's and Eugene's victories over the French, were brought to a close only under his younger son Charles VI. In the German empire the long reign of Leopold witnessed the growing power of the house of Brandenburg under Frederick William, the great elector, whose son assumed the royal title under the name of Frederick I. in 1701. The house of Hapsburg, however, consolidated itself under Leopold, who became the heir of the Tyrol line of the family.

**LEOPOLD II.**, emperor of Germany, of the house of Hapsburg, born May 5, 1747, died March 1, 1792. He was the son of the emperor Francis I. and Maria Theresa, and on the death of his father in 1765 succeeded him on the throne of Tuscany, which he had received in exchange for Lorraine. Mild, humane, and well educated, though of very dissolute habits, Leopold ruled his grand duchy in the spirit of



his age, and a series of liberal reforms had made it almost a model of a monarchical state, when the death of his brother Joseph II. in 1790 called him to the greater cares of the vast Austrian dominions and soon after of the German empire. Joseph's violent reforms and ambition had given rise to disaffection in almost all his provinces, a revolution in Belgium, a similar movement in Hungary, a dangerous war with Turkey, and menaces of another on the part of Prussia, seconded by Holland and England; while the gathering revolutionary tempest in France threatened not only all Leopold's monarchical interests, but also the personal safety of his sister Marie Antoinette. He hastened to make terms with Frederick William II. at Reichenbach (July 27, 1790), was unanimously elected German emperor, pacified Hungary by taking the royal oath to observe strictly the constitution, restored all their ancient privileges to the Belgians, gave Tuscany to his son Ferdinand, concluded a peace with Turkey at Sistova (Aug. 4, 1791), concerted with Frederick William Augustus of Saxony, and others, at Pilitz, preliminary measures for meeting the aggressions of the French revolution, and finally made a formal alliance with Prussia (February, 1792), when he died suddenly of dysentery. Of his 16 children, his eldest son Francis succeeded him on the throne of Austria, as well as in the German empire, being the last of its elective rulers. His correspondence with Francis II. and the empress Catherine was edited by Adolf Beer (1874).

**LEOPOLD I.** (GEORGES CHRÉTIEN FRÉDÉRIC), king of the Belgians, born in Coburg, Dec. 16, 1790, died at Laeken, near Brussels, Dec. 10, 1865. He was a son of Duke Francis of Saxe-Coburg-Saalfeld, received a brilliant education, entered the military service of Russia, and in 1808 accompanied the emperor Alexander I. to Erfurt with the rank of general. Compelled by the influence of Napoleon in 1810 to relinquish his position in the army of the czar, he devoted himself to the interests of Saxe-Coburg. In February, 1813, he rejoined the emperor Alexander, and took an active part in the battles of Lützen, Bautzen, and Leipsic. In 1814 he accompanied the allied sovereigns to England, where he made the acquaintance of the princess Charlotte, whom he married, May 2, 1816; she died in November, 1817, after having been delivered of a still-born child. On occasion of this marriage Leopold was raised to the rank of a British field marshal, became a member of the privy council, was created duke of Kendal, and a pension of £50,000 was conferred upon him. After the death of his wife he resided at London, and chiefly in his palace of Claremont. Early in 1830 the crown of Greece was offered to him, which he finally refused, after having accepted it upon conditions which were not complied with. In June, 1831, he was elected king of the Belgians, and ascended the throne on July 21. In 1832 he married the accomplished daughter of Louis

Philippe, the princess Louise, who died Oct. 11, 1850. She bore him three children: 1, Leopold, who succeeded his father as king of the Belgians; 2, Philippe, count of Flanders and lieutenant general of the army, born March 24, 1837; 3, Marie Charlotte, born June 7, 1840, married on July 27, 1857, to the archduke Maximilian of Austria, afterward emperor of Mexico. (See MAXIMILIAN.) Although his private fortune was much impaired by the sequestration of his second wife's property, included in Louis Napoleon's confiscation of the Orleans estates in 1852, he was one of the richest men in Europe, and was thought parsimonious. He passed most of his time during the latter years of his life in retirement with his family at his country seat of Laeken, or upon his extensive domain of Ardenne near Dinant, and was opposed to all pomp or ostentation at his court.—King Leopold displayed much ability in the discharge of his duties as a constitutional sovereign in the domestic affairs of Belgium, as well as in the relations with foreign countries. On the outbreak of the French revolution of 1848 he offered to retire if such was the wish of the people, which had the effect of increasing his popularity. He also showed much tact in his relations with the French emperor, while his conciliatory disposition and his comprehensive statesmanship, as well as his family connections with most of the European dynasties, enabled him on several occasions to act as mediator in times of political complication. His relation with the English court was peculiarly intimate, owing to his first marriage with Princess Charlotte, and his relationship with Prince Albert and Victoria, of whom he was the uncle, her mother the duchess of Kent being his sister.

**LEOPOLD II.** (LOUIS PHILIPPE MARIE VICTOR), king of the Belgians, son of the preceding and of Louise, daughter of Louis Philippe, king of the French, born at Brussels, April 9, 1835. As prince he bore the title of duke of Brabant. On Aug. 22, 1853, he married Marie Henriette, daughter of the late Archduke Joseph of Austria, palatine of Hungary. Of this union the surviving offspring is three daughters, a son, born in 1859, having died in 1869. He was a member of the Belgian senate, travelled extensively, and on the death of his father succeeded to the throne, Dec. 10, 1865. In the administration of the government he has continued the policy of his father, and is very popular among his people.

**LEOPOLD II.**, grand duke of Tuscany and archduke of Austria, born Oct. 3, 1797, died in Bohemia, Jan. 29, 1870. He was a son of the grand duke Ferdinand III. and a nephew of the emperor Francis I. of Austria. He succeeded his father June 13, 1824, and became the most liberal among the rulers of Italy, granting a constitution to his duchy in 1847, and even relinquishing in 1848 his title of archduke and joining in the warfare against Austria, but yet without giving full satisfaction to the Tuscans.

He escaped to Naples in February, 1849, and returned to Florence in July at the request of his subjects, but not before the arrival of Austrian troops. Despite his tolerant disposition and his sympathy with letters and art, his subsequent reign incurred great popular odium. He declined to join the cause of Italy in 1859, and only abdicated in favor of his son, Ferdinand IV. (July 21), after his flight from Florence (April 27), when it was too late to save his dynasty. His dominions were added to those of Victor Emanuel, March 22, 1860. He spent the rest of his life chiefly at his château of Brandeis in Bohemia.

**LEOPOLD I.**, prince of Anhalt-Dessau (popularly known as the old Dessauer), a German soldier, born in Dessau, June 3, 1676, died there, April 7, 1747. On the death of his father, John George II., in 1693, he succeeded him as commander of a Prussian regiment; and having participated in the capture of Namur by William III. of Orange (1695), he was made major general. On attaining his majority in 1698 he assumed the rule of his principality, and soon afterward married, despite his mother's objections, a druggist's daughter, who bore him nine children, and who was elevated by the emperor Leopold I. to an equal rank with her husband. In his administration he endeared himself to the masses of the people, notwithstanding his bluntness and domineering disposition; but he was exacting toward the rich, and imposed heavy taxes upon landed proprietors and upon Jews. His military genius was displayed in many battles in 1702, and especially on Sept. 20, 1703, in his masterly retreat at Höchstädt, and in the celebrated battle of Aug. 13, 1704, near the same town, known in English history as that of Blenheim; and to him alone belongs the merit of compelling the surrender of the strong fortress of Landau. In 1705-'7 he won new laurels under Prince Eugene, particularly during the hot contests at the bridge of Cassano in 1705, in the lines of Turin, which was captured in 1706, and in the assault on Toulon and the taking of Susa in 1707. In 1709 he was with the Prussian crown prince, the future king Frederick William I., at the battle of Malplacet. Soon afterward he was placed, at Prince Eugene's request, in command of the Prussian subsidiary troops, and took several French towns, cooperating with Marlborough in 1711 at Arras in defeating the French general Villars. At the end of the following year he became general field marshal and privy councillor of war. After the death of Frederick I. (1713) his influence increased under the new king Frederick William I. as the foremost authority in military affairs. He invented the iron ramrod and the equal step; and Carlyle calls him the inventor of modern military tactics, who drilled the Prussian infantry to be the wonder of the world. In 1715, during the warfare with Charles XII. of Sweden relative to Pomerania, he was commander-in-

chief of a considerable army, and effected a landing and successfully entrenched himself on the island of Rügen, ending the contest by driving the Swedish king from Stralsund (Dec. 15) and by the conquest of that stronghold. In 1725 he fought a bloodless duel with Gen. Grimkow, a partisan of England and the Hanover treaty; and Grimkow was for a time in the ascendant in the king's favor. During the detention of the crown prince at Küstrin in 1730-'31 Leopold befriended him, and assisted him in his military studies. Immediately after the death of Frederick William I. (1740) Leopold had an interview with Frederick II., expressing a hope that he would have the same authority as in the late reign. The king replied that he would not deprive him of his functions, but as to authority he said with flashing eyes: "I know of none there can be but what resides in the king that is sovereign." The army of 70,000 men, however, which he found at the opening of his reign, had been raised to its high state of efficiency through Leopold's exertions. Though the latter incurred Frederick's displeasure by disapproving of the campaign of 1741 against Austrian Silesia, early in April he formed a camp of 36,000 men to be ready both against Saxony and Hanover; and in the beginning of 1742 he reinforced the king with 20,000 men, joining him together with his son at Chrudim (April 17), and received a preference over General Schwerin as commander at Troppau, but incurred another sharp rebuke by not strictly following his sovereign's orders. In the winter of 1744-'5 he succeeded Frederick as commander-in-chief of the Silesian army, defeated the Austrians at Neustadt and near Jägerndorf, repelling their invasion of Silesia, and returning at the end of February to Berlin to receive the thanks of the king and to mourn over his wife, who had died Feb. 7. In March he was again called upon to operate against Saxony; and after forming his memorable camp at Dieskau he ended the war and at the same time his military career by the decisive battle of Kesselsdorf, Dec. 15, 1745, which was followed by the capture and the peace of Dresden.—His son and successor, **LEOPOLD II.** **MAXIMILIAN**, a gallant warrior, died Dec. 16, 1751; and his other sons Moritz and Dietrich, the former likewise a soldier to the last, died respectively in 1760 and 1769. See the life of Leopold I. by Varnhagen von Ense in *Biographische Denkmale* (5 vols., Berlin, 1824-'30; new ed., 1874).

**LEOSTHENES**, an Athenian general, who commanded the confederate Greek forces in the Lamian war, 323 B. C. He probably acquired his high military reputation as a leader of mercenaries in the Persian service. He collected and led back to Greece those Hellenic soldiers who had been warring against the Macedonians, and had been disbanded by command of Alexander. On the death of that conqueror, the Athenians resolved to make one

bold effort to recover their freedom and expel the Macedonians from Greece, and Leosthenes was appointed to conduct the war. Having worsted the Bœotians, who adhered to the foreigner, Leosthenes defeated Antipater and the Macedonians near Thermopylæ, and compelled them to seek refuge in the town of Lamia; but while pressing the siege of this place he received a wound in the head, and died.

**LEPAGE, Marie Anne.** See **BOCCAGE.**

**LEPANTO** (mod. Gr. *Epacto*). I. A seaport town of Greece, in the nomarchy of Acarnania, capital of the eparchy of Naupactus, on the N. coast of the gulf of the same name, 12 m. N. by E. of Patras; pop. about 3,000. It is built on a hill and commanded by a castle, and is the seat of a Greek archbishop. The neighboring country produces grain, rice, wine, tobacco, and olive oil, and leather is manufactured and exported. The name of the place in antiquity was Naupactus, when it was a strongly fortified town of the Ozolian Locri, and renowned for its harbor. The Athenians, who became masters of it after the Persian wars, made it their headquarters in western Greece during the Peloponnesian war. Philip of Macedon assigned it to the Ætolians, but the Romans restored it to Locris. In the middle ages Lepanto was long in possession of the Venetians, by whom it was fortified, and under whom it sustained a siege by the Turks in 1477 which lasted four months, when the besiegers withdrew with the loss of 30,000 men. It was ceded to the Turks in 1697. II. **Gulf of**, also called gulf of Corinth, between the N. coast of the Morea or Peloponnesus and the mainland of Greece, about 75 m. long from E. to W. At its W. end is the gulf of Patras, which is connected with it by a strait somewhat more than a mile in width, called the strait of Lepanto, and sometimes the Little Dardanelles. Toward the middle the gulf of Lepanto attains the width of about 16 m. It is surrounded by lofty and picturesque mountains. This gulf was the scene of one of the most important naval battles ever fought. In 1571 war existed between the Turkish sultan Selim II. and Philip II. of Spain, Pope Pius V., and the Venetian republic. The three Christian powers fitted out a great armada, of which the command was given to Don John of Austria, natural son of the emperor Charles V., then about 24 years old. The allied fleet assembled at Messina in Sicily; it consisted of 300 vessels, of which 200 were "royal galleys" of large size, manned by 50,000 seamen, and 20,000 Spanish and 9,000 Italian soldiers, comprising many cavaliers of rank and distinction. On Sept. 16 this formidable armament sailed from Messina, and at sunrise on Sunday, Oct. 7, 1571, reached the entrance of the gulf of Lepanto, where they came in sight of the Turkish fleet, consisting of 250 royal galleys of the largest size, besides many smaller vessels, the whole carrying 120,000 men. The Christian fleet extended on a front of three miles, the right com-

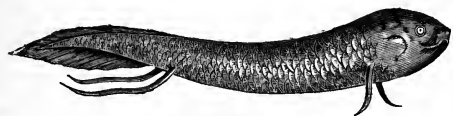
manded by the Genoese admiral Doria, the left wing by the Venetian admiral Barbarigo, and the centre by Don John in person, supported on the one side by Colonna, the papal captain general, and on the other by the Venetian captain general Sebastian Veneiro. The centre of the Turkish fleet was commanded by Ali Pasha, the right wing by Mohammed Sirocco, the viceroy of Egypt, and the left by Ulutch Ali, dey of Algiers. The last two were commanders of great experience and reputation. Before the battle began Don John embarked in a light galley and passed rapidly through his fleet, saying to his followers: "You have come to fight the battle of the cross—to conquer or to die. But whether you are to die or conquer, do your duty this day, and you will secure a glorious immortality." The action began about noon, and lasted more than four hours. It resulted in the total defeat of the Turks, of whose entire fleet not more than 46 galleys escaped, while 130 were taken and 80 burned or sunk. Their loss in men was about 25,000 killed and 5,000 prisoners. More than 12,000 Christian captives who had been chained to the oars on the Turkish galleys were also set free. Ali Pasha, the Turkish commander-in-chief, was killed. The loss of the allies was 1,000 Romans, 2,000 Spaniards, and 4,600 Venetians. Among the Spaniards engaged in the battle was Cervantes, the future author of "Don Quixote," serving as a common soldier. This victory caused a profound sensation throughout Christendom, as it was the first effective blow given to the power of the Turks, who had hitherto been thought invincible by sea. The pope on hearing the tidings burst into tears, exclaiming: "There was a man sent from God, and his name was John." The Turks themselves were so disheartened by this defeat, that the decline of their power dates from the battle of Lepanto. Prescott's "History of the Reign of Philip I. of Spain" contains a masterly description of the battle.

**LEPAUTE, Nicole Reine Étable de Labrière**, madame, a French mathematician, born in Paris, Jan. 5, 1723, died at St. Cloud, Dec. 6, 1788. She was married in 1748 to the celebrated mechanic and clockmaker Jean André Lepaute (1709-89), and was the principal author of his *Traité d'horlogerie* (1755). In 1757 she assisted Clairaut and Lalande in calculating the attraction of Jupiter and Saturn on the comet predicted by Halley. Lalande acknowledged her services in his *Théorie des comètes*, and Babinet likewise rendered justice to her genius. From 1754 to 1759 she edited *La Connaissance des Temps*, an astronomical annual of the academy of sciences, in which in 1763 she published a table of paralactic angles for the better observation of the progress of the eclipse predicted for April 1, 1764. She also wrote *Exposition du calcul astronomique*.

**L'ÉPÉE, C. M.**, abbé de. See **ÉPÉE.**

**LEPIDOPTERA**, an order of insects. See **BUTTERFLY**, and **MOTH.**

**LEPIDOSIREN**, a vertebrated animal, possessing characters of both fishes and reptiles, and alternately referred by naturalists to one or the other of these classes. This animal was discovered by Dr. Natterer in the river Amazon in 1837, and was referred by him and Fitzinger to this genus, considered by them as belonging to the fish-like or perennibranchiate reptiles. Prof. Owen ("Linnæan Transactions," vol. xviii., and "Proceedings of the Linnæan Society," April 2, 1839) had recorded this same paradoxical animal, in his MS. catalogue of the museum of the college of surgeons (1837), as a new genus of abdominal malacopterygian fishes, under the name of *protopterus*; he afterward made this family of *sirenidæ* the type of a distinct order of fishes, the *protopteri* (the *sirenoidei* of Müller); he referred it to fishes on account of its scaly covering and of its nostrils not communicating with the mouth, and to the abdominal malacopterygians from its soft and rudimentary fins, indicating a transition from the abdominal to the apodal families, and for various other anatomical reasons. The skeleton is partly osseous, partly cartilaginous; the body is fish-like in form, and covered with cycloid scales; the pectorals and ventrals are mere jointed flexible rays; the bodies of the vertebræ remain in the em-



Lepidosiren.

bryonic state of a continuous chondro-gelatinous cord, though many other parts of the skeleton are well ossified. This transitional state between the embryonic condition of ossification of the vertebral centre and that of ordinary bony fishes, was common in the ganoid fishes, not one of which in the Silurian or Devonian epochs, according to Agassiz, had a vertebral centrum. There are 36 pairs of ribs, encompassing about one sixth of the abdominal cavity; immediately in front of the pectorals there is a vertical branchial opening; on the intermaxillary bones are two long, slightly curved, slender, acute teeth, on the upper jaw on each side a dental plate divided into three cutting lobes, and on the lower jaw a similar single plate whose lobes fit into the intervals of the upper, fitted for minute division of food; the tongue is well developed, the pharynx with a small valve-protected opening, the gullet short and narrow, the stomach thick, simple, and straight, the liver of good size with gall bladder, and the straight intestine with an internal spiral fold; there is neither pancreas nor spleen. The respiratory organs consist of branchiæ, with a double elongated air bladder resembling the cellular lungs of a reptile; the branchial sac is large, and the gills are supported on four arches on each side, two additional

arches offering no trace of gills, there being five intervals for the passage of water into the pharynx; the nasal cavities open into the mouth (this is denied by Owen), and the laryngeal opening leads to the honeycombed air bladders or lungs, which are behind the kidneys and internal reproductive organs; the kidneys are long and narrow, the ureters and the genital ducts opening into the cloaca; the heart, in a strong pericardium, has a single ventricle, a single imperfectly divided auricle, and an arterial bulb, a large part of the blood in the adult being sent to the air bladders for purification. The eyes are small and adherent to the skin, which passes over them without forming any projection, and the lens is small and spherical; there is no trace of tympanic cavity nor Eustachian tube. The scaly covering, soft fin rays, characters of the spinal canal and cord, mucous ducts and lateral line, peculiarities of the cranial and jaw bones, intestinal spiral valve, absence of spleen and pancreas, single auricle, the nasal sacs opening only externally (the last denied by many), and the articulation of the scapular arch to the occiput, prove, according to Owen, that the lepidosiren is a fish, and not a batrachian, forming a connecting link between cartilaginous and soft-rayed fishes, and coming in this class the nearest to the perennibranchiate reptiles. The *L. paradoxa* (Natterer), from the morasses of the river Amazon in Brazil, attains a length of about 3 ft.; when the water dries up, they plunge under the mud; the food is said to consist of vegetable matters. The *L. annectens* (Owen), from the river Gambia and also the Mozambique coast, is a smaller species, rarely more than 2 ft. long. In the "Proceedings of the Zoölogical Society of London" for Nov. 11, 1856, Mr. J. E. Gray advocates the batrachian nature of the lepidosiren, three specimens of which were brought alive from Africa, enclosed in balls of hardened clay in which they remained torpid during the eight months of the dry season; they were on exhibition at the crystal palace at Sydenham for a considerable time, and one for several months. From the account there given it appears that this animal can move with considerable rapidity forward and upward by means of its tail, which is surrounded by a membranous expansion like a confluent dorsal and anal fin. The pectoral limbs are elongated and margined behind with a narrow membrane, the ventral having a similar edging in the middle of the outer side; they are very mobile and flexible, and are used more like feet than fins, supporting the body about two inches from the bottom, and also serving to direct its motions; the two processes on each side over the pectorals, considered as external gills by some, he regards as a portion of the anterior limb, as they possess no peculiar vascular structure; the movements are much more like those of the water salamanders than of eel-shaped fishes. The mucous pores on the

head and the lateral line are common to fishes and some batrachians; the small, circular pupil is black, and the narrow iris golden; the mouth is firmly closed by the overhanging upper lip, except in front, where the water is admitted to open external nostrils on the middle of the under side of the upper lip; the lips close behind, so that water cannot pass into the mouth under these circumstances except through the nostrils; the internal openings of the nostrils are just behind the edge of the closed lips, and through them the animal breathes water in the quiescent state, passing it out at the gill aperture in front of the pectorals; it also introduces water to the gills through the widely extended mouth. As if this were not sufficient for respiration, it occasionally rises to the surface and takes in air by the open mouth, and swallows it into the sacculated lungs, a few bubbles generally escaping from the gill aperture. These internal nostrils were noticed by Bischoff in the *L. paradoxa*. It thus appears that the lepidosiren, or mud fish, breathes by both gills and lungs, taking in water by the nostrils, and respiring air like batrachians and water like fishes, constituting as near an approach to an amphibious animal as is known to exist; it probably can no more live on air alone than can the *menobranchus* or fish lizard of the North American lakes. They are abundant in the rice fields, which are under water for more than half the year; the natives dig them out of the mud toward the end of the dry season, and consider them a delicacy. The mud cocoons in which they were carried to England had each a small opening at the end where the nose of the animal is placed; as developed at the crystal palace, they were very thin and 9 in. long when they left the cocoon, but began to feed at once on worms, small frogs, fish, and raw meat, attacking each other with fury, and one at last killing and half devouring another; in three months they attained a length of 18 in. The movements, as in the *menobranchus*, are generally sluggish, but they are capable of very rapid motion; the food seems to be detected as much by scent as by sight. While in the cocoons they are in a state of hibernation, the blood being sufficiently purified by the arterial trunks distributed to the air bladders. The color of the *L. annectens* is a mixed tint of dark olive-green and brown, lighter below, with irregular dark spots as large as the scales chiefly confined to the tail, and the mucous pores and lateral line black. The anus does not open on the median line of the body. With such contradictory opinions as to the position of this animal, possessing characters both of the fish and the batrachian, it would seem to belong to a distinct order (*dipnoi*), forming one of the most interesting links between the ichthyoid batrachians and the cartilaginous fishes.

**LEPIDOSTEUS**, a ganoid fish. See **GAR FISH**.

**LEPIDUS**, the cognomen of a distinguished Roman family of the *Æmilian gens*, the most

illustrious of whom were the following. **I. M. Æmilius**, died in 152 B. C. He was one of the three persons sent to Egypt by the Romans in 201 to act as guardians to the infant king Ptolemy V., was elected pontiff in 199, ædile in 192, prætor in 191, and consul in 187. While consul he reduced the Ligurians, and continued the Via Flaminia from Ariminum to Aquileia. In 180 he became *pontifex maximus*, in 179 censor, and in 175 a second time consul. He was six times chosen *princeps senatus*. **II. M. Æmilius Porcina**, consul in 137 B. C., was sent into Spain to conduct the war against the Numantines; but instead of doing so, he attacked the Vaccæi, with whom the Romans were at peace, and laid waste their territory. For this aggression he was recalled, deprived of his command, and fined. He was, according to Cicero, the most eloquent orator of his age. **III. M. Æmilius**, in the civil war between Marius and Sulla, espoused the cause of the latter, but afterward married the daughter of the tribune Saturninus, and deserted to Marius. In 81 B. C. he was prætor in Sicily, and by his exactions and oppressions rendered himself odious to the inhabitants. In 79 he became a candidate for the consulship, and was elected through the instrumentality of Pompey; but having failed in an attempt to effect the legal abrogation of Sulla's laws, he retired into Etruria, raised an army, and advanced against Rome. He was encountered by Pompey and Catulus under the walls of the city, and completely defeated (77). **IV. M. Æmilius**, the triumvir, died in 13 B. C. He was prætor in 49, and on the outbreak of the civil war between Cæsar and Pompey joined the party of the former, who intrusted him with the government of Rome during his absence from Italy. In 48 he received the province of Hither Spain, where he distinguished himself by his vanity and avarice. In 47 Cæsar made him his *magister equitum*, and the next year his colleague in the consulship. Lepidus was in the vicinity of Rome at the head of a considerable force when the dictator was assassinated, and by supporting Antony obtained for himself the office of *pontifex maximus*. He then repaired to his præconsular provinces beyond the Alps, and remained there in a state of armed neutrality till Antony fled to him for protection after his defeat at Mutina. The two generals, now uniting their forces, once more entered Italy, and at Bononia, in 43, formed in conjunction with Octavius that celebrated coalition termed the triumvirate. In this combination Lepidus was but a cipher, receiving in the division of the empire only the provinces of Spain and Narbonese Gaul, and remaining in Rome as consul while Antony and Octavius marched against Brutus and Cassius. After the battle of Philippi he was deprived of his provinces on an unfounded charge of treasonable conduct, but was to receive Africa on its being disapproved; it was not till two years later (40), however, that he was allowed to proceed thither. In 36, being called to Sicily by Octa-



vius to aid him against Sextus Pompey, he attempted to take possession of the island and make himself independent of his colleague; he succeeded in gaining over eight of the Pompeian legions, which with his own made a powerful army. Octavius, after tampering with his soldiers, ventured personally into his camp, exhorting them to prevent a civil war by coming over to him. Though he was wounded and obliged to retire, this bold proceeding had the desired effect, the legions gradually deserting Lepidus till he was left powerless, and on his knees begged Octavius for his life. He was deprived of all share in the government, and kept under strict surveillance at Circæi.

**LE PLAY, Pierre Guillaume Frédéric**, a French author, born at Honfleur, April 11, 1806. He became a military engineer, director of a mining school, and commissary general of the Paris exhibitions of 1855 and 1867. The academy of sciences awarded a prize to his *Ouvriers européens* (Paris, 1855). Among his other works are: *La réforme sociale en Europe* (2 vols., 1864); *Organisation du travail selon la coutume des ateliers*, and *La loi du Décalogue* (1870); and *Organisation de la famille* (1871).

**LE POITTEVIN, Edmond Modeste Eugène**, a French painter, whose real name is POIDEVIN, born in Paris in 1806. His "Reapers" (1826) was purchased by the duchess of Berry. Among his subsequent works are: "Van der Velde painting in the midst of a Battle," and "The Grave Digger and his Children" (1843); "Winter in Holland" (1845); "Shipwreck in the Polar Seas" (1867); "A Delicate Attention" (1868); and "The Potato Crop" (1869).

**LEPRA** (Gr. *λεπρός*, scaly), a skin disease which in the most common form (*lepra vulgaris*) is characterized by circular patches, the centre depressed with the skin sound or nearly so, the circumference slightly elevated and covered with small, dry, shining scales. It commences with an eruption of small, red, elevated points, each covered with a minute scale; the disease advances at the circumference, the centre gradually becoming sound. The eruption is perfectly dry. The circular patches rarely become more than an inch in diameter. Where the eruption is copious, these patches intersect each other at the circumference, and the circular form is lost, but characteristic segments of a circle can still be traced. The disease commonly commences in the extremities, and often extends over the trunk; the head and face are very rarely affected. When it is very chronic and extensive, the roots of the nails are sometimes affected, and the nails become thickened, curved, and of a dirty yellow color; according to Rayer (*Maladies de la peau*), the matrix of the nails sometimes becomes inflamed and furnishes a sanious discharge. The general health is very slightly affected by the disease, and the patient only suffers from an annoying itching, aggravated by warmth, exercise, or full diet, and chiefly present at the commence-

ment of the complaint or while it is spreading. *Lepra alphoides* is a variety of the disease in which there is less redness of the skin and elevation of the circular margin of the patches, while the scales are smaller and of a more pearly whiteness. In *lepra nigricans* the scales have a dark or blackish color; it is a rare form, and according to Bielt always of syphilitic origin. Lepra is mainly an affection of youth and adult life, but no age is exempt from it. It is unattended with danger to life, but obstinate and uncertain of cure, sometimes disappearing in one place to appear in another, or reappearing directly after remedial means have been discontinued. Its essential causes are unknown.—*Treatment*. Internally the remedy from the use of which benefit is derived in the greatest number of instances is undoubtedly arsenic. Fowler's solution may be given in doses of from 3 to 5 drops three times a day, its effects being carefully watched. Bielt in many instances has derived great advantage from the tincture of cantharides, commencing with small doses, which are gradually increased. Externally, alkaline baths (from 4 to 8 oz. of the sub-carbonate of potassa to a bath) and vapor baths have been particularly recommended. Tar ointment (1 part to 8 of lard) is of undoubted efficacy. Bielt also recommends the use of an ointment of iodide of sulphur (12 grs. to the ounce of lard), and of calomel ointment (1 dram to the ounce).

**LEPROSY**, a name under which during the middle ages were confounded tubercular elephantiasis, elephantiasis of the Arabs (Barbadoes leg), the scaly diseases of the skin (lepra and psoriasis), and other chronic skin diseases which were rendered rife and inveterate by a bad diet and want of cleanliness. The same confusion existed among the ancient Hebrews and Egyptians, and probably among other eastern nations, from the earliest historical times. The Hebrews brought the affliction with them into Palestine, and the stringent provisions of the Mosaic law show how dreadful must have been its ravages and how great the terror which it excited. Regarding it as a disease sent from God, for which no natural remedy could be prescribed, they required that the person supposed to be infected should show himself to the priest; and if in the opinion of the latter the disease was leprosy, he was declared unclean and immediately separated from the rest of the people. So strictly was the rule observed, that even kings afflicted with the disease were expelled from their thrones and shut out from society. Outside the gates of cities and in secluded districts were usually found leper villages, an institution still existing in the East, where these outcasts of society dragged out their wretched lives, depending upon their own labors and the alms of the charitable for the relief or protection seem to have been unknown among any of the nations

of antiquity. With the tide of emigration westward during the decline of the Roman empire leprosy was disseminated over Europe, and during the middle ages prevailed to such a frightful extent that from the 6th to the 15th century the efforts of lawgivers were unceasing to arrest its diffusion. Its principal ravages in the West date after the first crusades. The isolation of the infected was still the universal practice, but under the influence of Christianity a more humane spirit presided over the treatment of lepers, and hospitals and asylums on charitable or religious foundations were provided for their reception. In the 13th and 14th centuries these buildings almost literally covered the face of the continent, being numbered by thousands in every country. Every considerable town had one or more of them in its neighborhood, and at one period it is said that scarcely a town or burgh in France was unprovided with such an establishment. Almost from the commencement of the Christian era pious fraternities are said to have been organized for the care of persons afflicted with leprosy; and Pierre de Belloy, in his *Origine et institution de divers ordres de chevalerie*, mentions an order of St. Lazarus, so called from Lazarus the beggar (Luke xvi. 20), the patron of lepers, which was established as early as A. D. 72. A military order of St. Lazarus was established by the crusaders at Jerusalem in the early part of the 12th century, whose duty it was originally to take charge of lepers and their asylums in the Holy Land. The knights hospitallers of St. Lazarus, after being driven out of Palestine, established themselves in France and instituted a celebrated hospital or leazar house outside the gates of Paris. Subsequently, under the protection of several popes, they settled in Sicily and lower Italy; but with the disappearance of the disease they lost their distinctive religious and charitable character, in accordance with which their constitution required the grand master to be a leper. In general, however, hospitals for the reception of lepers were supported by chance eleemosynary contributions, and in secluded portions of the country the condition of the inmates was scarcely less pitiable than in ancient times. But even under the most favorable circumstances the leper was completely and for ever an outcast from the world, being considered both legally and politically as a dead person. Upon being set apart from his fellow creatures the ceremonial for the burial of the dead was pronounced over him, masses were said for the benefit of his soul, and, to carry out the illusion to the fullest extent, a shovelful of earth was thrown upon his body. His marriage ties were thenceforth dissolved, although he might contract a new marriage with a person similarly afflicted; he was prohibited from entering any church or place where food was prepared, from dipping his hands in any running water, and from taking up food or any other article necessary to him without

the assistance of a stick or fork; and he was strictly enjoined to wear a peculiar dress by which he could be known at a distance, and to give notice of his approach by ringing a bell. With the progress of civilization, and the improvement of the condition of the poorer classes, leprosy declined rapidly; and except in Norway and a few places in the south, it is now unknown in Europe. The horror which the various forms of the disease formerly inspired has, notwithstanding its disappearance, remained in full force, and the word leper at the present day designates a person whose social and physical condition has reached the lowest pitch of degradation. In the East it still exists in its ancient seats, and sporadic cases are found in the islands of the Indian archipelago, in the Hawaiian islands, on the coasts of Africa, in the West Indies, and in Canada and elsewhere in America.

**LEPSIUS, Karl Richard**, a German Egyptologist, born in Naumburg, on the Saale, Dec. 23, 1810. In 1828 he began the study of languages at the university of Leipsic, and continued it at Göttingen and Berlin, at which latter place he was a pupil of Bopp. In 1833 his essay on the Eugubian tablets obtained for him the degree of doctor from the university of Berlin. In 1834 he published his *Paläographie als Mittel der Sprachforschung* (2d ed., Leipsic, 1842), and in the same year went to Paris, where through his friend Humboldt he became well known to the French literati. In April, 1836, he arrived at Rome, where he became a member of the archæological institute and formed an intimacy with Bunsen. From this time he began to devote himself to the study of Egyptian antiquities, and in 1837 attracted much attention by his *Lettre à M. Rosellini sur l'alphabet hiéroglyphique*. His residence in Italy was short, but during it he made researches which formed the basis of several works published at a later date. Among these were his *Inscriptiones Umbricæ et Oscæ* (1841), the *Todtenbuch der Aegypter*, the impression of a papyrus in the museum of Turin (Leipsic, 1842), an essay on comparative philology and one on the numerals in the Indo-Germanic languages, for which he received a prize of 1,200 francs, and two essays on the ancient inhabitants of Italy. In 1838 he went to England on a mission from the archæological institute of Rome. Here in company with Bunsen he subsequently projected a great work on ancient Egypt, the materials for which were partly to be gathered by personal investigations in that country. Through the intervention of Bunsen, Humboldt, and Eichhorn, Frederick William IV. of Prussia was induced to send an expedition of learned men and artists to Egypt, with Lepsius at its head. The party assembled at Alexandria in the autumn of 1842, and began its researches under protection of the government. Among the discoveries which Lepsius made in Egypt are monuments of some of the Pharaohs of the old Egyptian monarchy and

later Ethiopian dynasty, the remains of the labyrinth, and Lake Mœris. To these may be added the plan of the Memnonium and the tomb of Rameses II. or Sesostris. But the most important discoveries claimed were that the Ethiopian civilization was in fact Egyptian, introduced 2,000 years before Christ, that the Ethiopians of Merot were not a black but a brown Caucasian race, and that a great number of genuine Ethiopic inscriptions are still extant from the Merotic pyramids down to Philæ. Among the members of this expedition were the two Weidenbachs, the architects Erbkam and Wild, Bonomi, Abeken, and the painter Georgi. Its results gave the most complete satisfaction when in 1845 it returned to Europe. It had previously transmitted a portion, and on returning brought with it the remainder, of a very fine collection of Egyptian antiquities, now in the museum of Berlin. While in Egypt, Lepsius wrote his *Briefe aus Aegypten, Aethiopien und der Halbinsel des Sinai* (Berlin, 1852; translated by Horner, London, 1853), in which his travels and discoveries were described in a spirited manner. Previous to his departure for the East, Lepsius had been elected one of the directors of the archæological institute, and he was also appointed by the king professor at Berlin. In 1866 he made a second visit to Egypt for the purpose of examining geographically the delta of the Nile, during which he discovered in the ruins of Tanis an important bilingual inscription, in hieroglyphics and Greek, of the time of Ptolemy III. Evergetes. In 1874 he was placed at the head of the Prussian state library in Berlin. Among his principal works are: *Chronologie der Aegypter* (Berlin, 1849); *Ueber den ersten ägyptischen Götterkreis* (1851); *Ueber die 12te ägyptische Königsdynastie* (1853); and *Das allgemeine linguistische Alphabet* (1855). The first number of his great work, *Die Denkmäler aus Aegypten und Aethiopien*, was published in 1849, and was continued in parts during ten years, being completed in 1859. His later works are: *Ueber einige Berührungspunkte der ägyptischen, griechischen und römischen Chronologie* (Berlin, 1859); *Die altägyptische Elle und ihre Einteilung* (Berlin, 1865); *Älteste Texte des Tottenbuchs nach Sarkophagen des altägyptischen Reichs* (Berlin, 1867); and various treatises referring to the original systems of writing of the Chinese, Thibetan, Arabic, Persian, and Zend languages. Under the title *Denkmäler aus Aegypten und Aethiopien* has also been issued a selection of photographs from his great work on Egypt (4 series, 12 sheets each, Berlin, 1873). Since 1864 he has also been associate editor of the archæological periodical founded by Brugsch, entitled *Zeitschrift für ägyptische Sprache und Alterthumskunde*. Alexander von Humboldt based all his statements in his *Kosmos* relating to Egyptian chronology and history on manuscript information which he received from Prof. Lepsius.

**LEQUESNE, Eugène Louis**, a French sculptor, born in Paris in 1815. He studied in Paris and Rome. His earliest notable work was a "Dancing Faun" (1850), which is in the garden of the Luxembourg. He subsequently completed the statue of Victory on Napoleon's tomb, which had been commenced by Pradier, and executed many other works, including statues of a "Bathing Girl" and "Lesbia," a "Roman Slave," and a bust of Adelina Patti (1863). He also decorated the church of St. Augustine, and in 1870 executed "Pegasus" for the new opera house.

**LERDO DE TEJADA.** See TEJADA.

**LÉRIDA.** I. A N. E. province of Spain, in Catalonia, bounded N. by the Pyrenees, and bordering on France, the republic of Andorra, and the provinces of Gerona, Barcelona, Tarragona, Saragossa, and Huesca; area, 4,774 sq. m.; pop. in 1870, 330,348. The surface is mountainous in the N. part, being covered with spurs of the great range which separates it from France, but in the S. there are extensive plains. The principal river is the Segre, an affluent of the Ebro; it traverses the province in a S. S. E. direction, and receives a number of tributaries. A large part of the soil is fertile, producing grain, fruit, and many kinds of garden vegetables. Much attention is paid to the raising of bees and silkworms. Iron, copper, lead, zinc, coal, granite, marble, jasper, lime, and gypsum are the chief minerals. II. A city (anc. *Ilerda*), capital of the province, on the right bank of the Segre, which is here crossed by a stone bridge of seven arches, 235 m. E. N. E. of Madrid, and 80 m. W. by N. of Barcelona; pop. about 20,000. It is built partly on a hill and partly on the plain at its foot, and is strongly defended by walls, batteries, and a castle. It is an important military post, being regarded as the key of Aragon and Catalonia. The streets are narrow, crooked, and ill paved. The principal buildings are the old and new cathedrals, one or two ancient churches, the bishop's palace, diocesan seminary, town house, theatre, hospitals, &c. The university of Lérída, once an institution of some repute, was suppressed by Philip V. The town has an export trade in silk, hemp, wine, oil, and other produce of the surrounding territory. The chief manufactures are linen, woollen, silk, and cotton fabrics, leather, paper, soap, and brandy. In ancient times it was the capital of the Ilergetes. It witnessed a victory by Cn. Scipio over the Carthaginian general Hanno in 216 B. C., and the defeat of Pompey's lieutenants Afranius and Petreius by Cæsar in 49 B. C. It was long in possession of the Moors, and was conquered from them by Raymond Berenger of Aragon, who made it the capital. It was taken by the French in 1707 and 1810.

**LÉRINS, Islands of**, a group in the Mediterranean belonging to France, in the department of Alpes-Maritimes, consisting of the fortified St. Honorat (anc. *Lerina* or *Planasia*), and

Ste. Marguerite (anc. *Lero*), situated opposite Cannes, between Capes Roux and Guaroupe, and a number of islets and shoals. Ste. Marguerite, about 2 m. long, is occupied only by a garrison and by fishermen. It contains a castle, used as a state prison, in which "the man in the iron mask" and other famous personages were detained. Marshal Bazaine was imprisoned there in 1873, and escaped in the night of Aug. 9, 1874. Francis I., while on his way to Spain as a prisoner, was confined in a monastery here originally dedicated to Ste. Marguerite. St. Honorat, smaller but much more attractive than Ste. Marguerite, derived celebrity from the earliest abbey of the Gauls, founded here by St. Honoratus, which in the 5th century, under the influence of St. Eucherius, and particularly of St. Maximus, became the principal theological centre of Europe. St. Hilary, St. Lupus, Faustus, and St. Vincent de Lérins were among its eminent abbots. It began to decline at the end of the 6th century, and became the scene of discord at the close of the 7th, when the monks assassinated their abbot. Subsequently it was destroyed by the Saracens, who massacred the inmates; but it was rebuilt during the middle ages by the Benedictines, and endowed with many privileges. Members of the Guise and Bourbon families were among its commendatory abbots in the 16th and 17th centuries. But early in the 18th only a few monks remained at the abbey, which was entirely suppressed after the outbreak of the revolution of 1789.

**LERMONTOFF, Mikhail**, a Russian poet, born in October, 1814, killed in a duel in the Caucasus in July, 1841. He was of noble birth, and in early manhood became an officer of the imperial guards. The death of Pushkin in a duel in 1837 seems to have been his first incentive to poetical composition; but his poem commemorating this event proved so distasteful to the emperor Nicholas, that he struck the name of Lermontoff from the list of officers of the guard, and sent him to serve in the army of the Caucasus, where he remained until his death. During this brief period he composed the greater part of his poems, which have gained for the author the title of the poet of the Caucasus. Among his chief productions are: "The Novice, or the Young Circassian," illustrating the strong love of the Circassians for their native mountains; "The Dream of Valerika;" "Hadj-Abrek," a drama; "Ismail Bey;" "The Demon," published in Berlin in 1857; and the "Song of the Ozar Ivan Vasilievitch." Most of these were collected at St. Petersburg after his death. A third edition of them was published there in 1852, and in the same year a German translation by Bodenstedt appeared in Berlin. During his residence in the Caucasus Lermontoff also wrote a remarkable novel entitled "A Hero of our Time." A fellow officer, feeling himself portrayed in it, challenged and killed him.

**LERO** (anc. *Leros*), a small island of the Grecian archipelago, belonging to the Sporades, lying off the W. coast of Asia Minor, about 30 m. S. of Samos; length about 9 m., average breadth 4 m.; pop. about 3,000. The surface is rocky and mountainous, but the soil is fertile in parts, producing fruits, wheat, maize, &c. The island is famous for its honey. The principal place is a town of the same name on the E. coast, and there is a commodious harbor, called Partheni, on the N. side. It is the seat of a Greek bishop, and has a castle and considerable trade. The earliest inhabitants of the island were a colony of Milesians. Strabo describes the Lerians as dishonest. They had a celebrated temple of Diana.

**LEROT.** See DORMOUSE.

**LEROUX, Pierre**, a French socialist, born in Paris in 1798, died there, April 12, 1871. After studying several years in the college of Rennes and in the polytechnic school of Paris, he became a compositor and afterward proof reader in a printing office, and in 1824 was selected to be one of the editors of the *Globe*, a philosophical and literary journal, the organ of the *doctrinaire* party, having for collaborators De Broglie, Guizot, Jouffroy, and Cousin. The revolution of 1830 dispersed the editorial corps, and Leroux, who had zealously embraced Saint-Simonism, effected the transformation of the *Globe* into the organ of his new doctrines. He separated from *Enfantin* in 1831 on the question of the emancipation of woman, and with Jean Reynaud he edited for three years (1832-'5) the *Revue Encyclopédique*, which they made the organ of their Neo-Saint-Simonism, but which failed of success. They began in 1838 the *Encyclopédie nouvelle*, which still remains incomplete. He furnished numerous philosophical articles to the *Revue des Deux Mondes* during the first six or seven years of the reign of Louis Philippe. In 1840 appeared his most important work, *De l'humanité, de son principe et de son avenir*. In 1841 he founded, with Viardot and George Sand, the *Revue Indépendante*. In 1845 he founded a printing establishment at Boussac, in Creuse, and published two journals and numerous pamphlets. He proclaimed the republic there after the revolution of 1848, and was chosen mayor of his commune. The same year he was elected to the national assembly, where he voted constantly with the radical party. But the arena of practical politics was unsuited to his mind. He left France after the *coup d'état* of Dec. 2, 1851, and established himself on a farm in the island of Jersey. The general amnesty of 1860 permitted his return to France, but he made his home at Lausanne till 1869, when he went back to Paris. His various works contain a complete philosophy of life, embracing on the one side religious and metaphysical doctrines that incline to mysticism, and on the other a system of social organization. Besides the works which have been mentioned, his principal publications are:

*D'une religion nationale, ou du culte* (1846); *Discours sur la situation actuelle de la société* (1847); *De l'humanité, solution pacifique du problème du prolétariat* (1848); *Projet d'une constitution démocratique et sociale* (1848); *Du Christianisme et de ses origines démocratiques* (1848); *Malthus et les économistes, ou y aura-t-il toujours des pauvres?* (1849); *La Grève de Samarez, poème philosophique* (1863-'4); and *Job*, a drama in five acts (1865). Several of these are reproductions from periodicals. Though knowing nothing of the German language, he also with the aid of a friend made a very successful translation of Goethe's *Werther* (1843), to which George Sand wrote a preface. At the time of his death he was preparing a complete edition of his works.

**LEROY D'ÉTIOLLES, Jean Jacques Joseph**, a French surgeon, born in Paris, April 5, 1798, died there, Aug. 25, 1860. He was educated at the imperial lyceum, subsequently studied medicine, and in 1822, before receiving his degree of doctor, presented to the academy of surgery a set of instruments invented by himself for the operation of lithotripsy. The invention was claimed by Civiale and Amussat, but after a thorough examination awarded to Leroy d'Étiolles. In 1831 the academy awarded him a prize of 6,000 francs for a forceps used in the performance of the operation. He was the author also of many other inventions, and of works on lithotripsy, urology, the prostate gland and bladder, a translation of Cooper's "Dictionary of Surgery," &c.

**LEROY DE SAINT-ARNAUD, Jacques Achille**, a French soldier, born in Paris, Aug. 20, 1801, died at sea, Sept. 29, 1854. His family, whose name was simply Leroy, belonged to the middle classes. He was educated at the college of Louis le Grand, and received an appointment in the body guard of Louis XVIII., which he was compelled to leave on account of the part which he took in the street riots of 1820. After leading a precarious life for a number of years in England and France, during which he occupied many subordinate positions, at one time following the profession of an actor under the name of Florival, he succeeded in 1831 in getting reinstated in the army with the rank of sub-lieutenant. He took part in the so-called Vendean war of 1831; and in 1833, when Gen. Bugeaud was appointed governor of the citadel of Blaye, where the duchess of Berry was detained, Leroy was chosen as the assistant jailer, although he was characterized in the records of his regiment as being "lazy, dissipated, fond of gambling, and over head and ears in debt." Subsequently he pushed his fortunes in Algeria, where he displayed great personal bravery at the taking of Constantine. In 1844 he succeeded Cavaignac as commander of the military division at Orleansville. After his capture of the rebel chieftain Bou-Maza he was made brigadier general (1847). In February, 1848, he went to Paris, married a rich Belgian heiress, and afterward returned to Algeria as com-

mander of the province of Constantine. In 1851 he operated successfully against the unruly Kabyle tribes, after which he was made general of division (July 10) and commandant of one of the military divisions of Paris, in which post he became a favorite with Louis Napoleon. Made minister of war in October, 1851, he was among the most active in aiding the consummation of the *coup d'état* of Dec. 2. His salary as minister of war was now raised from 48,000 to 100,000 francs, in addition to his salary of 30,000 francs as senator. A dowry of 300,000 francs was presented by Louis Napoleon to his daughter, and in 1852 he received the titles of marshal and of grand equerry of France. In April, 1854, he was invested with the command of the French forces in Turkey, in which capacity he strenuously insisted upon the landing in the Crimea. Although tortured by intense suffering from disease and wounds, he was on the battle field of the Alma for 12 hours. He was compelled to relinquish his command on Sept. 26, after which cholera was added to his other maladies, and he died three days afterward, while on his way to Constantinople. The *Lettres du maréchal de Saint-Arnaud* were published in 2 vols. in Paris in 1855 (2d ed., 1864).

**LERWICK**, a town of Scotland, capital of the Shetland islands, on Bressay sound, on the E. side of Mainland, 20 m. N. E. of Sumburgh head; pop. in 1871, 3,449. The main thoroughfare is a tortuous path between the houses, which are built close to the water's edge. In the vicinity are the ruins of a castle of supposed Pictish origin. The harbor is well protected and easily accessible. The coasting trade and fisheries are active. Nearly 100 vessels belong to the port.

**LE SAGE, Alain René**, a French author, born at Sarzeau, Brittany, May 8, 1668, died in Boulogne, Nov. 17, 1747. An only son, and an orphan at 14 years of age, his uncle, to whom he was intrusted, sent him to be educated in the Jesuits' college at Vannes, and meantime dissipated the little property which had been left to him. He became a favorite at the college, after leaving which he seems to have held for several years an office in the collection of the taxes in Brittany. In 1692 he went to Paris to pursue his studies in philosophy and law, made his way into the best society, is said to have been offered the hand and fortune of a lady of quality, which he declined, and in 1694 married Marie Élisabeth Huyard, the daughter of a citizen. He was admitted an advocate, but preferred to seek resources in literature, and made from a Latin version a translation of the letters of Aristænetus (Paris, 1695), which had little success. There are few traces of him for several years, till the abbé de Lyonne became his patron, gave him a pension of 600 livres, and led him to study and admire Spanish literature. He translated three plays (1700-'2) from Roxas and Lope de Vega, none of which were success-



ful, and his *Nouvelles aventures de l'admirable Don Quichotte* (2 vols., 1704-'6), from Avellana's continuation of Cervantes, were also unnoticed. In 1707 he translated from Calderon the comedy *Don César Ursin*, which failed at the Théâtre Français; but a slight piece of his own, entitled *Crispin rival de son maître*, had a brilliant success, and gave the first proof of his genius. His romance *Le diable boiteux*, a satire, the idea of which was borrowed from the Spanish of Guevara, appeared in the same year, and immediately passed through two editions. He availed himself of his experience among the farmers of the revenue in his next play, *Turcaret*, to attack the corruptions and ignoble vices of financiers. This powerful body is said to have offered him 100,000 livres to suppress it, and was able to prevent its representation for more than a year. It had a reputation in society before it was produced on the stage, where it was received with the greatest favor, though its excellence consists only in its delineations of manners. His next work was the novel *Gil Blas de Santillane* (2 vols., 1715; vol. iii., 1724; vol. iv., 1735), a series of pictures of all classes and conditions of society and of life in Spain under all its aspects. The delicate delineations of character, the nervous and effective style, the skillful blending of the manifold portraits into one comprehensive picture, are among the merits which have made this one of the most popular of novels; and it has been translated into all the languages of Europe. Its originality has been several times contested. Voltaire ventured to assert, with no reason at all, that it was taken from the *Marcos de Obregon* of Espinel. The Spanish Jesuit Isla asserted, what there are no facts to confirm, that it was originally written in Spanish, but was denounced and prohibited by the government, when the author fled to France with a single copy, which came after his death into the hands of Le Sage. The delay of the comedians of the Théâtre Français in producing one of his pieces caused Le Sage to abandon them, and to write light farces and comic operas for theatres of secondary rank. Either alone or with several associates he composed more than 100 comic operas, most of which were exceedingly popular. His principal later labors were *Roland l'amoureux*, an imitation of the *Orlando innamorato* of Boiardo (1717-'21); an abridged translation from the Spanish of Aleman's "Guzman de Alfarache;" the *Aventures de Robert, dit le chevalier de Beauchesne* (1732), from materials furnished by his widow; *Histoire d'Estévanille Gonzalès* (1734), a free translation from the Spanish; *Une journée des Parques* (1735); *Le bachelier de Salamanque* (1736); and *Mélange amusant de saillies d'esprit et de traits historiques des plus frappants* (1743). A complete edition of his works appeared in Paris in 1828, in 12 vols. *Gil Blas* has been translated into English by Smollett, Proctor, Smart, and Malkin, the last being a

revision of Smollett. *Le diable boiteux* bears in English the title of the "Devil on Two Sticks," though in the most recent editions it is called "Asmodeus;" and English translations of several of his other works have appeared.

**LESBOS.** See MYTILENE.

**LESCARBOT, Marc**, seigneur de St. Audebert, a French historian, born at Vervins about 1570, died about 1630. His earliest known work, *Discours sur la réunion des Églises d'Alexandrie et de Russie à la sainte Église catholique*, appeared in 1599. Taking an interest in American colonization, he joined De Monts's colony in Acadia (now Nova Scotia) in 1605, and was actively engaged with Poutrincourt in establishing Port Royal, till it was abandoned in 1607. On his return to France he published *Histoire de la Nouvelle France* (1609), with a collection of poems called *Les muses de la Nouvelle France*. His history embraced a summary of Cartier's voyages and the French colony in Florida, as well as the more recent efforts at the north, including in detail that in which he took part; a second edition, with additional matter, appeared in 1611, and was soon reprinted; and a third and still more enlarged edition in 1618, including *La conversion des sauvages*, first published in 1610, and *Relation dernière de ce qui c'est passé au voyage du sieur de Poutrincourt*, about 1612. The second edition was reprinted at Paris in 1866, in 3 vols. English and German translations appeared in 1609 and 1613. He then seems to have pursued his profession as advocate in the French parliament, gaining the favor of President Jeannin, and of the chancellor Brulart de Sillery, with whose son, Pierre de Castelle, ambassador to Switzerland, he visited that country, and published a poetical account of it, *Le tableau de la Suisse* (1613). His last work, *La chasse aux Anglais dans l'île de Rhé*, appeared in 1629. One of the poems in his *Muses* describes the defeat of the Armouchois Indians in Maine by the Micmac sagamore Membertou in 1607.

**LESGHIANS**, a warlike people of the Caucasus, inhabiting the western portions of the province of Daghestan and some adjacent parts. They number about 300,000, and are subdivided into a number of tribes, speaking various dialects, some of which so widely differ from each other that the Tartar language has generally become a medium of conversation between different tribes. They never formed one commonwealth until Shamyl succeeded in uniting them against the Russians. After his submission in 1859 the Russian rule was firmly established. Accustomed to a warlike life, the Lesghians inhabit chiefly mountain villages, which are difficult of access, and can easily be converted into strong fortresses. The Christian religion has not yet gained a firm footing among them. Their present belief is a kind of Mohammedanism, which was taught by Shamyl. (See CAUCASUS, and SHAMYL.)

**LESLEY, John**, a Scottish prelate, born Sept. 29, 1527, died in Brussels, May 31, 1596. He was the illegitimate child of a priest. He graduated at King's college, Aberdeen, became a canon of the cathedral churches of Aberdeen and Elgin in his 20th year, and, after a long period of study in various continental universities, was in 1554 appointed professor of canon law in the university of Aberdeen. He opposed the introduction of Protestantism into Scotland, and upon the accession of Mary, whom he accompanied from France, he was appointed bishop of Ross. His fidelity to the queen involved him in perilous intrigues and misfortunes. After the imprisonment of Mary in Bolton castle he took part in the negotiations between her and Elizabeth. He was subsequently examined on suspicion of being implicated in the scheme for marrying Mary to the duke of Norfolk, and in the rising of the earls of Northumberland and Westmoreland, and suffered a long confinement in the tower of London. In 1573 he was permitted to go to France, and for several years was employed in various missions in the interest of Mary and the Catholic cause, and in preparing for the press his general history of Scotland. In 1579 he was appointed suffragan and vicar general of the diocese of Rouen, and in 1593 bishop of Coutances in Normandy. The state of public affairs in France soon after induced him to seek an asylum in Brussels, where he died. He wrote several works, in English and in Latin, in defence of Mary, queen of Scots; also *De Origine, Moribus et Rebus Gestis Scotorum*, in 10 books (4to, Rome, 1578; reprinted in Holland in 1675). The greater part of this work is an abridgment of Boëthius; the last three books only, from the death of James I. in 1437 to the return of Queen Mary to Scotland in 1561, being original. This latter part, in the Scottish tongue, was printed by the Bannatyne club (4to, Edinburgh, 1830).

**LESLEY, John Peter**, an American geologist, born in Philadelphia, Sept. 17, 1819. He graduated at the university of Pennsylvania in 1838, and from 1839 to 1841 was engaged on the geological survey of that state under Prof. Henry D. Rogers. In the autumn of 1841 he entered the theological seminary of Princeton, N. J., and in 1844 was licensed as a minister by the presbytery of Philadelphia. After a while he visited Europe for a year, and pursued his theological studies at Halle. On his return he labored for two years as a missionary among the German population of Pennsylvania, and in 1847 became pastor of a Congregational church in Milton, Mass. He married in 1849 Miss Susan Lyman of Northampton, and in 1851, his theological views being no longer in accordance with his ecclesiastical position, he left the pulpit and settled in Philadelphia, where he has since devoted himself to geology. He had in 1842 constructed the state geological map and sec-

tions for Pennsylvania, and in 1846-'7 revised them, and prepared the drawings and a large part of the text of the subsequently published report on the geology of that state. His work as a geologist has been more especially devoted to the coal formations of North America, and he is regarded as a chief authority in all questions connected therewith. His "Manual of Coal and its Topography" (1856) is esteemed alike for its classification of the Appalachian coal strata, and for its illustrations of topographical geology. He was for several years secretary to the American iron association, and in 1859 published "The Iron Manufacturers' Guide." He has also for many years been secretary and librarian of the American philosophical society. In 1865 he gave a series of lectures before the Lowell institute in Boston, since published under the title of "Man's Origin and Destiny as seen from the Platform of the Sciences" (1868), in which he has brought together the results of varied studies. A large number of his geological papers, relating chiefly to coal, iron, and petroleum, and various essays on philological and antiquarian subjects, will be found in the proceedings of the American philosophical society. In 1872 he was appointed professor of geology and dean of the faculty to the newly established scientific department of the university of Pennsylvania, and in 1874 chief geologist of Pennsylvania, under a new act providing for a complete geological resurvey of that state.

**LESLIE. I. Charles Robert**, an English painter, born in London, Oct. 17, 1794, during the temporary residence there of his parents, died there, May 5, 1859. His father, a watchmaker of Philadelphia, and a warm personal friend of Franklin, Jefferson, and other distinguished men, went in 1793 to England with the intention of engaging in the exportation of clocks and watches to America. In 1800 young Leslie accompanied the family on their return to Philadelphia, and after the usual term of school education he was apprenticed to a bookseller. He had long shown a predilection for the study of painting, which in a few years he obtained the means of pursuing in London under the auspices of Benjamin West and Washington Allston. He arrived in England in 1813, and, after some attempts at historical painting on a large scale, commenced a class of subjects particularly adapted to display his powers, and in which for many years he had no superior among English artists. The great humorous authors of England became the chief source of his inspiration, and many familiar scenes from Shakespeare, Addison, Sterne, Pope, Goldsmith, Fielding, and Smollett were illustrated by him. From "Don Quixote," "Gil Blas," and Molière's plays he also drew the subjects of some of his happiest efforts. His "Anne Page and Master Slender," "Sir Roger de Coverley going to Church," "May Day in the Reign of Queen Elizabeth," and other pictures of the kind exhibited between 1820 and 1825,

established his reputation; and within a few years he was elected an associate and a member of the royal academy. In 1833 he accepted the appointment of professor of drawing in the military academy at West Point; but after discharging the duties of the office for a few months he returned to England, where he resided until his death. In 1847 he became professor of painting at the royal academy, and the substance of his lectures during the four years that he held the office has been published under the title of "A Handbook for Young Painters." He is also the author of "Memoirs of John Constable" (1845); "Life and Times of Sir Joshua Reynolds," continued by Tom Taylor (2 vols., 1865); and "Autobiographical Recollections," edited by Tom Taylor (2 vols., 1860). His pictures cover a period of between 40 and 50 years, and many have been engraved. Besides humorous subjects, he painted history, *genre*, portraits, and ceremonials, among the latter the "Coronation of the Queen" and the "Christening of the Princess Royal." His religious pieces are considered much inferior to his others. His earlier works are elaborately finished, and are distinguished by peculiar excellence in expression and composition, and a genial humor altogether original. **II. George Dunlop**, an English painter, son of the preceding, born in London, July 2, 1835. He was educated at the mercers' school in London, and in 1854 was admitted as a student of the royal academy. His first exhibited painting, "Hope," was in 1857 purchased by Lord Houghton. He was elected an associate of the royal academy in 1868. His works are very numerous; among them are: "Bethlehem" (1860), "Fast Day at the Convent" (1861), "A Summer Song" (1862), "The War Summons" (1863), "The Flower and the Leaf" (1864), "The Defence of Latham House" (1865), "Clarissa" (1866), "The Country Cousin" (1867), "Reminiscences of the Ball" (1868), and "Fortunes" (1870). **III. Eliza**, an American authoress, sister of C. R. Leslie, born in Philadelphia, Nov. 16, 1787, died in Gloucester, N. J., Jan. 2, 1858. She was the eldest child of her parents, whom she accompanied to England in 1793, and with whom she returned to the United States in 1800, after which she resided almost constantly in Philadelphia. Her earliest attempts in literary composition were in verse, but it was not until her 40th year that she appeared as an authoress. Her first work, "Seventy-five Receipts for Pastry, Cakes, and Sweetmeats" (1827), was the precursor of a series of treatises on the culinary art which made her name widely known. "The Domestic Cookery Book" (1837) has passed through many editions, and "The House Book" (1840) and "The Lady's Receipt Book" (1846) have enjoyed a considerable popularity. Shortly after the appearance of her first work she commenced a series of juvenile story books, and in 1831 published "The American Girls' Book." Hav-

ing obtained a prize for her story of "Mrs. Washington Potts," she was encouraged to write fictions for grown people, and for several years contributed to magazines and journals, besides editing several annuals. "Amelia, or a Young Lady's Vicissitudes," is her only novel, her remaining works being short tales or sketches, of which the most popular are the three volumes of "Pencil Sketches." Besides these, several volumes of her fugitive stories appeared from time to time. In 1853 she published "The Behavior Book," and during the last years of her life she was engaged upon a life of John Fitch, the experimenter in steam navigation.

**LESLIE, Henry**, an English composer, born in London, June 18, 1822. He studied under Charles Lucas, cultivating music at first as an amateur and subsequently with a view to making it his profession. When the musical society of amateurs was founded in 1847, he took a prominent part in it, and in 1855 was made leader of its orchestra, which post he held until the dissolution of the society in 1861. In 1856 he founded a choral society, which has since become famous under the name of Henry Leslie's choir, and which he brought to the highest point of finish in every respect that should characterize good part singing. He has written symphonies, overtures, and oratorios, and has composed many madrigals, trios, and concerted pieces for voices without accompaniment, of exceptional merit.

**LESLIE, I. John**, a British prelate, born at Balquhain, in the north of Scotland, about 1570, died in Clogher, Ireland, in 1671. He was educated at the universities of Aberdeen and Oxford, and during an extended continental tour became an accomplished linguist. His knowledge of Latin was so remarkable that in Spain it was said of him, *Solus Lesleivus Latine loquitur*. Upon returning to England, after an absence of 22 years, he enjoyed the favor of Charles I., who admitted him into his privy council, made him bishop of the Orkneys, and in 1633 of Raphoe in Ireland. Here he built a palace of great strength, in which during the civil wars he sustained a siege by the parliamentary troops, being the last to surrender to Cromwell. He remained abroad until after the restoration, when he returned to England, and was appointed in 1661 to the see of Clogher. At the time of his death he was the oldest bishop in the world, having filled that station 50 years. **II. Charles**, a theological author, son of the preceding, born at Raphoe, county Donegal, Ireland, about 1650, died at Glaslough, Monaghan, April 13, 1722. He was educated at Trinity college, Dublin, studied law and then theology, and took orders in 1680. By opposing the intrusion of a Catholic sheriff he involved himself in a conflict with the government of James II., but refused to take the oaths of allegiance to William after the revolution. In 1689 he engaged in a controversy with Bishop Burnet in defence of the doctrine of passive obedience. In 1709, being

suspected by the government, he took refuge at the court of the pretender, and made an effort to convert him to Protestantism, but the prince forbade him to speak on the subject of religion either to himself or his chaplains. After the failure of the pretender's expedition, Leslie accompanied him to Italy, but was allowed to return to England in 1721. The most important and popular of his works is his "Short and Easy Method with the Deists" (1694), many times reprinted. A collection of his theological works has been published in 7 vols. 8vo (Oxford, 1832).

**LESLIE, Sir John**, a Scottish mathematician, born at Largo, Fifehire, April 16, 1766, died at Coates, in the same county, Nov. 3, 1832. He was educated at the universities of St. Andrews and Edinburgh, and while a student in the latter institution was employed by Adam Smith as tutor to his nephew, afterward Lord Reston. In 1788-9 he was absent in America as tutor to two young Virginians of the Randolph family; and in 1790 he went to London, intending to establish himself there as a lecturer on natural philosophy. Disappointed in this project, he translated Buffon's "Natural History of Birds," published in 1793 in 9 vols. Subsequently he travelled in the capacity of tutor to Thomas Wedgwood, and, after being an unsuccessful candidate for professorships at St. Andrews and Glasgow, obtained in 1805 the chair of mathematics in Edinburgh. In 1819 he succeeded Prof. Playfair in the chair of natural philosophy, which he filled until his death, a few months previous to which he was knighted. His scientific publications commenced with an "Essay on the Resolution of Indeterminate Equations," printed in the "Edinburgh Philosophical Transactions" for 1788; and in 1799 he contributed a description of a hygrometer and photometer invented by himself to Nicholson's "Philosophical Journal." His "Experimental Inquiry into the Nature and Propagation of Heat," published in 1804, gained him the Rumford medal of the royal society. His "Course of Mathematics" (2 vols. 8vo, 1809-'22) comprises "Elements of Geometry," "Geometrical Analysis," "Plane Trigonometry," and "Geometry of Curve Lines;" an abridgment of a portion of this work was published in 1828, entitled "Rudiments of Plane Geometry, including Geometrical Analysis and Plane Trigonometry." He also published in 1817 "The Philosophy of Arithmetic," founded upon an article contributed to the "Encyclopædia Britannica." In 1810 he discovered the process of artificial congelation, by which he was enabled to freeze water and even mercury at pleasure, and three years later published in connection with the subject "A Short Account of Experiments and Instruments depending on the Relations of Air to Heat and Moisture." He also produced "Elements of Natural Philosophy," vol. i., "Mechanics and Hydrostatics" (1823; 2d ed., enlarged, 1829); and "The Progress of

Mathematical and Physical Science during the Eighteenth Century," one of the preliminary dissertations of the "Encyclopædia Britannica."

**LESPINASSE, Julie Jeanne Éléonore de**, a French lady remarkable for her intellectual gifts and accomplishments, born in Lyons, Nov. 19, 1732, died in Paris, May 23, 1776. She was the illegitimate daughter of the countess d'Albon, on whose death in 1748 she accepted a place as governess in the family of her brother-in-law, Vichy-Chamrond, and in 1753 she was engaged as companion by her mother's sister-in-law, the marchioness du Deffand. This lady was D'Alembert's intimate friend, and her house was a favorite resort of many eminent persons. Julie's remarkable qualities, both of the mind and the heart, made a profound impression upon all who were brought in contact with her. Mme. du Deffand's jealousy became excited, and a separation between the two ladies ensued in 1764. To the small annual income which had been bequeathed to Julie by her mother, a pension was added by the king. Her house soon became a great centre of attraction for the notabilities of Paris. She enlisted the regard of D'Alembert, Marmontel, La Rochefoucauld, and other eminent literary men, while even Mme. Geoffrin made an exception in her favor, and not only admitted her to her literary reunions, from which women were generally excluded, but conferred upon her an annuity of 3,000 francs. With D'Alembert her relation was fraternally intimate and enduring, but the warmth of her affections was reserved for the count de Mora, a Spanish nobleman, whose death plunged her into great affliction. Another object of love soon presented itself in the person of Col. Guibert, celebrated for his relations with Frederick the Great, but this passion was not reciprocated. Her letters were published at Paris in 1809.

**LESSEPS, Ferdinand de**, viscount, a French diplomatist, born in Versailles, Nov. 19, 1805. In 1825 he was attached to the French consulate at Lisbon, and in 1828 to that in Tunis. After the taking of Algiers he was charged with securing the submission of the bey of Constantine, and in 1831 he went to Egypt, where at three different times he was temporary consul general at Alexandria. He obtained from Ibrahim Pasha, during the occupation of Syria by the latter, protection for the Christians there, and did much toward reestablishing peace between Mehemet Ali and the sultan. He was appointed consul at Malaga in 1839, and at Barcelona in 1842. During the bombardment of the latter city by Espartero in the same year, he rendered great service to sufferers of all nations. He frequently exposed his life during the fighting to save the lives of others; his energetic remonstrances postponed the bombardment for several days, and when it took place he hired vessels and personally superintended the removal of fugitives. For this he received decorations from

the governments of France, Sardinia, the Two Sicilies, Sweden, the Netherlands, and Spain; the chamber of commerce at Marseilles sent him a complimentary address, while that of Barcelona placed his bust in its hall. After the revolution of 1848 he was recalled to Paris, but soon went to Madrid as minister (April 10, 1848). Having been displaced in favor of Prince Napoleon Joseph Bonaparte, Feb. 10, 1849, he was appointed to Switzerland, but was sent in May to Italy, where he was expected to fulfil in concert with MM. d'Harcourt and de Rayneval the delicate task of restoring order in the papal dominions, and preventing liberal excesses from interfering with the establishment of a regular government. His instructions, it is asserted, were far from explicit; but the liberalism which he evinced in stipulating that the Roman people should be free to choose their own government was not agreeable to the authorities at home, and he was recalled in June. In a report from the council of state he was severely blamed, but he defended himself with great ability. In October, 1854, he went to Egypt on the invitation of the new viceroy Saïd Pasha. Here he thoroughly examined the project of the canal across the isthmus of Suez, and drew up a memorial on the subject, entitled *Perceement de l'isthme de Suez, exposé et documents officiels* (1856; 2d ed., 1858), giving full details of the enterprise. The viceroy granted him a charter for 99 years (Nov. 30, 1854; confirmed Jan. 5, 1856) for the establishment of a stock company for the execution of the canal, to be called *compagnie universelle du canal maritime de Suez*. (See CANAL.) De Lesseps gave himself up entirely to the project, and by the force of energy and perseverance raised the necessary capital, and began the work in 1859. He was beset by many difficulties. Eminent English engineers, among them Robert Stephenson, questioned its practicability; the British government regarded it as a political project, and refused to give it encouragement; and various complications arose with both the Turkish and Egyptian governments. But De Lesseps triumphed over all, and on Aug. 15, 1869, had the satisfaction of seeing the waters of the Red sea and the Mediterranean mingled in the Bitter lakes. The canal was formally opened on Nov. 17, with grand ceremonies, in the presence of the empress of the French, the emperor of Austria, the crown prince of Prussia, Prince Amadeus of Italy, Prince William of Orange, and many other distinguished personages, who were entertained with magnificent hospitality by the khedive. De Lesseps has been decorated by almost all the sovereigns of Europe. In February, 1870, the Paris geographical society awarded him the empress's prize of 10,000 francs, and in July following the honorary freedom of the city of London was presented to him. Since the completion of the Suez canal, he has suggested the conversion of the desert of Sahara into an inland sea, and the

cutting of a ship canal through the isthmus of Corinth to connect the gulfs of Lepanto and Egina. In 1874 he proposed a central Asian railway to unite directly the south of Europe with India. The project is not relished by some of the Anglo-Indian politicians, who wish to keep any overland railway out of the reach of Russian territory and Russian influence. But the British authorities are not unfavorable to the scheme; and De Lesseps visited British India to confer on the subject with the local authorities, who appointed a committee to take his project into consideration.

**LESSING, Gotthold Ephraim**, a German author, born in Camenz, Jan. 22, 1729, died in Brunswick, Feb. 15, 1781. His father, a clergyman, desired him to embrace his own profession, and at the age of 17 he went with this intention to the university of Leipsic. Already far advanced in the classics and mathematics, his restless and inquiring disposition soon diverted him from theology; and he acquired a passion for the theatre, cultivated the friendship of actors, became familiar with dramatic literature, and produced some dramatic pieces, including *Der junge Gelehrte*, *Der Freigeist*, and *Die Juden*. Toward the close of 1748 he followed his friend Mylius to Berlin, and there established a quarterly periodical devoted to the drama, which was continued for one year, and published a volume of poems under the title of *Kleinigkeiten*. From 1752 to 1760 he lived either in Wittenberg, where he received the degree of master, in Potsdam, in Leipsic, or in Berlin, being in the last city intimately associated with Moses Mendelssohn and F. Nicolai. He was constantly prosecuting literary projects during this period, translated from the Spanish Huarte's *Exámen de los ingenios*, wrote literary and theatrical criticisms for the journals, published several volumes of minor writings, fables, epigrams, and songs, and completed the tragedy of *Miss Sara Sampson* (1755), which contributed largely to free German literature from the prevalent imitation of that of France, and to give it a new and original character. To the same end he edited with Nicolai and Mendelssohn the *Bibliothek der schönen Wissenschaften*, a literary periodical, and founded in conjunction with Nicolai the *Literaturbriefe*. In this he was the first to call attention to the genius of Kant, Hamann, and Winckelmann, while he opposed Klopstock and Wieland, striving to purge religion from sentimentality and literature from frivolity. He began also a tragedy, of which the subject was the story of Virginia, which was completed in 1772 under the title of *Emilia Galotti*, the Roman Virginia being transferred into modern relations. This still remains one of the most admirable tragedies on the German stage. In 1760, after being elected to the Berlin academy of sciences, he went to Breslau as secretary to Gen. von Tauenzien, governor of that capital. The best fruit of his residence there, which continued till 1765, was his



celebrated drama *Minna von Barnhelm*. Returning to Berlin, he published there (1766) his *Laokoon, oder über die Grenzen der Malerei und Poesie*, a work which has exerted a permanent influence upon both literary and artistic criticism. In 1767 he became director of a theatre at Hamburg, where he published his *Dramaturgie* (1767-'69), a critical periodical, which played an important part in the strife then prevalent in Germany as to the relative merits of the French and English drama. He became intimate here with his subsequent antagonist the pastor Goeze. In 1770 he received from Prince Ferdinand of Brunswick the appointment of chief librarian at Wolfenbüttel, "rather that the library might serve him than he the library." He employed himself in exploring the literary treasures in the collection, and discovered the long lost work of Berengarius on the Lord's supper. In 1774 appeared the first of the *Wolfenbüttelsche Fragmente eines Ungenannten*, a manifesto against the historical basis of Christianity, written by the Hamburg professor Reimarus, but published and defended by Lessing. His principal opponent was his friend Goeze, against whom he directed his admirably satirical *Anti-Goeze*. His love of intellectual independence and impatience of authority appear from his declaration that if God held closed in his right hand all truth, and in his left the eternal desire for truth, and offered him the choice between them, he would humbly fall on the left, as pure truth was for God alone. He gave his confession of faith in a poetical and dramatic form in his *Nathan der Weise* (1779), the principal characters in which are a Jew, a Christian, and a Mohammedan, who vie with each other in tolerance, charity, and respect for the universal dogmas of morality. His last literary labor was the *Erziehung des Menschengeschlechts* (1780), an important contribution to the philosophy of history. His later years were engrossed by theological, antiquarian, and literary controversies, in which he took an eager delight as long as the vigor of his mind remained. Exhausted by labor, grieving for the loss of his wife, whom he had married in 1776, and who died in giving birth to his first child, which died with her, his health and spirits began in 1779 slowly to decline, and toward the close of his life he struggled in vain against frequent fits of cheerlessness and somnolency. He was an original and peculiar character, and was better appreciated by the next generation than by his own. Perhaps no one man has done more to confer on German literature its present many-sided character, or to strengthen German criticism by a study of art. His style is concise, simple, and equally lucid and vigorous. The spirit of independence which characterizes his writings also marked his entire life, and, in the words of Schlosser, "he neither made parties, cringed about courts, nor revelled in a little brief authority; he was neither the organ of an academy nor of a

university." He has frequently been called the Luther of German literature, of the German drama, and of German art.—The first complete edition of his works appeared in 1771-'94 (30 vols., Berlin), and an excellent edition was edited by Lachmann (18 vols., Berlin, 1838-'40). Concerning his life and character, see F. Schlegel, *Lessings Gedanken und Meinungen* (3 vols., Leipsic, 1804); Danzel, *G. E. Lessing, sein Leben und seine Werke* (1st vol., Leipsic, 1850; completed by Guhrauer); and Adolf Stahr, *G. E. Lessings Leben und Werke* (1859; translated into English by E. P. Evans, 2 vols., Boston, 1866). The *Laokoon* has been translated into English by E. C. Beasley (1853), by Ellen Frothingham (Boston, 1874), and by Sir Robert Phillimore (London, 1874); *Nathan der Weise*, by Dr. Reich (1860) and Ellen Frothingham (1867); *Minna von Barnhelm*, by Wrackmore (Boston, 1866). An English translation of his *Erziehung des Menschengeschlechts* ("Education of the Human Race") appeared in London in 1858. His fables and several of his comedies have also been translated.

**LESSING, Karl Friedrich**, a German painter, grand-nephew of the preceding, born in Wartenberg, Silesia, Feb. 15, 1808. His father, an officer of the Prussian government, placed him when about 12 years of age in the gymnasium of Breslau, to study the natural sciences. Such was his backwardness in the ordinary academical studies, that at the end of two years his teachers advised the father to allow the boy to follow his predilection for art, and become a painter. He was accordingly sent to the architectural school of Berlin, to fit himself for an architect; but the instructions of Professors Rösel and Dähling aroused in him an invincible love for painting, and the production of his "Churchyard with Gravestones and Ruins" (1825) fixed his profession irrevocably. This picture produced a strong impression, and for a year or two the artist devoted himself to landscape; but coming under the influence of Schadow, he established himself in Düsseldorf, and studied historical painting with an enthusiasm and success which soon caused him to be considered the most promising pupil of the new German school of which that master was an exemplar. Within a few years he produced a number of spirited works, including the cartoon of "The Battle of Iconium;" "The Castle by the Sea;" "The Mourning King and Queen," the head of the king being painted from that of Schadow; "The Robber;" "The Courtyard of the Convent, a Snow Scene," perhaps the most striking of all his landscapes; a "Scene from Lenore," &c. Subsequent to 1832 he entered upon a new style of treatment, substituting for the severe spirit in which his previous works had been conceived an earnest realism and an affluence of fancy which severed him completely from the school of Schadow, Veit, and their co-religionists. To landscape painting he also gave renewed attention, and

some of his most imaginative works in this department of art, including his "Scene in the Eifel," are referred to this period of his life. "The Tyrant Ezzelino in Captivity refusing the Exhortations of the Monks," exhibited in 1838, was his first important historical picture in the new style. It was followed by "Huss before the Council of Constance," "The Seizure of Pope Paschal II.," "The Martyrdom of Huss," and many others, under the influence of which the school of Düsseldorf has divested itself of the strictly Roman Catholic spirit by which it was previously characterized, and has adopted a bolder and more dramatic manner, and a greater freedom in the choice of subjects. Lessing however is distinguished from his associates by depth of thought, energy of expression, and vivid dramatic conception, at the same time that his pictures exhibit the hardness of outline and defective coloring peculiar to the Düsseldorf school. In 1858 he was appointed by the grand duke of Baden director of the gallery of paintings at Karlsruhe. Since that time he has painted a number of landscapes and portraits, among the latter those of the grand duke and many members of the court; and since 1866 he has been engaged on a large composition representing the disputation between Luther and Eck at Leipsic in 1519.

**LESTER, Charles Edwards**, an American author, born in Griswold, Conn., July 15, 1815. He was admitted to the bar, but spent two years at the Auburn theological seminary, and was duly licensed to preach. But he had to abandon the pulpit on account of frequent hæmorrhages from the lungs, and go abroad for his health. In 1840 he visited Great Britain, and soon after was appointed United States consul at Genoa, where he remained six years. Since his return from Europe he has resided in New York, devoting his attention to literature. Besides contributing largely to the American and European periodical press, he has edited various journals and magazines. His principal works are: "The Glory and Shame of England" (2 vols. 12mo, New York, 1841); "Condition and Fate of England" (1842); "The Artist, Merchant, and Statesman" (1846); "Life and Voyages of Americus Vesputius" (1846); "Artists of America" (1846); "My Consulship" (2 vols., 1851); and "The Napoleon Dynasty, a History of the Bonaparte Family, by the Berkeley Men" (1852). He has published translations of Alfieri's "Autobiography" (1845), Massimo d'Azeglio's "Challenge of Barletta" (1845), Machiavelli's "Florentine Histories" (2 vols., 1846), and Cebaz's "Citizen of a Republic." His latest works are "Life and Public Services of Charles Sumner" (1874), and "Our First Hundred Years" (1874 *et seq.*).

**LESTOCQ, Jean Herman**, count, a physician and favorite of Elizabeth of Russia, born in Celle, Hanover, about 1695, died in Livonia, June 23, 1767. He was the son of a French Protestant surgeon, studied medicine, and

in 1713 went to Russia to seek his fortune. He was first employed by Peter the Great, who, being soon disgusted with the shameful laxity of his morals, exiled him to Kazan in 1718. Catharine I., on her accession in 1725, recalled him, and appointed him physician in the household of her second daughter Elizabeth. In 1732 Augustus II. of Poland gave him the title of count. He soon gained an influence over the mind of the young princess, and when the imperial title devolved upon the boy Ivan, son of Anna Carlovna, he persuaded her that the only way of saving her own life was to seize upon the crown. She yielded to his suggestions, appealed to the Preobrazhenski regiment, Dec. 6, 1741, imprisoned the young czar, and seated herself on his throne. Lestocq was appointed privy councillor (which gave him the rank of general), physician in ordinary to her majesty, and president of the medical college. His prosperity lasted but a few years. Charged by the chancellor Bestuzheff with treasonable projects, he was arrested in 1748 with his wife, confined in the citadel of St. Petersburg, stripped of his offices and titles, knouted, and exiled to Uglitch on the Volga, whence he was sent in 1753 to Ustyug in the government of Vologda. Peter III. on his accession recalled him, and restored his titles and some of his property; and Catharine II. bestowed upon him a small estate in Livonia, where he passed the rest of his life in retirement.

**L'ESTRANGE, Sir Roger**, an English author, born at Hunstanton hall, Norfolk, in 1616, died in London, Dec. 11, 1704. He was the youngest son of Sir Hamond L'Estrange, and is believed to have been educated at Cambridge. During the civil war he was a zealous royalist, and in 1644, soon after the earl of Manchester had reduced the town of Lynn in Norfolk, L'Estrange received a commission from the king appointing him governor of the place if he could take it. He failed through the treachery of two of his associates, and being taken prisoner was sent to London, where he was condemned to death as a traitor. He was however reprieved, and remained a captive four years, until 1648, when he escaped to Kent. Here he attempted to raise an insurrection, but failing fled to the continent, where he remained until the dissolution of the long parliament (1653), when he returned to England, claiming that he was entitled to the benefit of the act of indemnity. His claim was not allowed; but having the boldness to apply to Cromwell in person, he was permitted to live unmolested. After the restoration he received the appointment of licenser or censor of the press. In 1663 he started a newspaper called the "Public Intelligencer," in which he warmly supported the crown. After the popish plot he published (1679-'87) another newspaper called the "Observer," which was intended to vindicate the measures of the court. On the accession of James II. he was knighted, and

sat in the parliament of 1685. He lost his office of censor at the revolution, and shortly after his mind failed. He wrote a great number of violent political pamphlets, and made many translations, chiefly from the Latin.

**LE SUEUR**, a S. E. county of Minnesota, bounded W. by the Minnesota river, and drained by numerous streams; area, about 450 sq. m.; pop. in 1870, 11,607. It has an undulating surface and fertile soil, and contains a number of small lakes. The St. Paul and Sioux City railroad passes through the W. part. The chief productions in 1870 were 248,609 bushels of wheat, 264,288 of Indian corn, 152,682 of oats, 61,520 of potatoes, 18,652 lbs. of wool, 320,985 of butter, and 18,510 tons of hay. There were 2,088 horses, 3,695 milch cows, 1,678 working oxen, 5,223 other cattle, 5,233 sheep, and 9,337 swine; 5 carriage factories, 6 flour mills, and 14 saw mills. Capital, Le Sueur.

**LESUEUR, Eustache**, a French painter, born in Paris in 1617, died there in 1655. He was a pupil of Vouet, and probably received advice and encouragement from Poussin on his visit to Paris. He assisted Vouet in some works ordered by Cardinal Richelieu, but remained unnoticed. Having married in 1642, he was long obliged to support his family by designing frontispieces of books, devotional pictures, &c. His masterpiece, "St. Paul healing the Sick by the Imposition of Hands," gained for him the surname of the "French Raphael." His grace of touch and composition is conspicuous in a series of 19 pictures which he executed in the drawing room of the hôtel Lambert, known as *le salon des muses*; but the peculiar character of his genius is still more thoroughly displayed in the 22 pictures representing the "Life and Death of St. Bruno." See his *Vie et œuvres*, by Vitet (Paris, 1849).

**LESUEUR, Jean Baptiste Cléron**, a French architect, born near Rambouillet, Oct. 5, 1794. He won the Roman prize at the school of fine arts in 1819, and spent several years in Italy. Returning to Paris, he designed the parish church of Vincennes (1828-'30), and subsequently was associated with Godde in enlarging the hôtel de ville. In 1846 he was admitted to the institute, and in 1852 became professor in the school of fine arts. In 1857 he completed the conservatory of music at Geneva. He has written, among other works, *Chronologie des rois d'Égypte*, which received an academical prize in 1846, and was published at the expense of the government (1848-'50).

**LE SUEUR, Jean François**, a French composer, born at Drucat-Blessiel, near Abbeville, Feb. 15, 1760, died near Paris, Oct. 6, 1837. He was educated in Amiens, where he acquired a considerable knowledge of the theory of music, and at 26 years of age was appointed chapelmaster of Notre Dame in Paris. In 1795 he became one of the inspectors of studies in the conservatory; in 1804 chapelmaster to Napoleon, which office he held until the restoration; and in 1814 royal director of music and chapel-

master. He is the author of five operas very celebrated in their day: *La caverne* (1793), *Paul et Virginie* (1794), *Télémaque* (1796), *Les bardes* (1804), and *La mort d'Adam* (1809). He also wrote, in connection with Persuis, *L'Inauguration du temple de la Victoire* (1807), and *Le triomphe de Trajan* (1807); and he was the author of more than 30 masses, oratorios, and sacred compositions, besides a highly esteemed work on the music adapted to sacred solemnities.

**LESZCZYNSKI**. See STANISLAS I. LESZCZYNSKI.

**LETCHER**, an E. county of Kentucky, bordering on Virginia, bounded S. E. by the Cumberland mountains, and drained by the head waters of the Kentucky river; area, about 300 sq. m.; pop. in 1870, 4,608, of whom 129 were colored. The surface is mountainous, and the soil fertile in the valleys. The chief productions in 1870 were 4,656 bushels of wheat, 124,478 of Indian corn, 10,744 of oats, 11,167 of potatoes, 6,582 lbs. of tobacco, 10,631 of wool, 44,596 of butter, and 10,444 of flax. There were 736 horses, 1,592 milch cows, 3,102 other cattle, 6,444 sheep, and 8,844 swine. Capital, Whitesburg.

**LETHE**, in Grecian mythology, the personification of oblivion, called by Hesiod a daughter of Eris. It was also a stream of silver clearness in Hades, from which the shades drank forgetfulness of their earthly life, or at least of all their sorrows. According to Virgil, also, those souls destined to return to new bodies on earth drank of its waters, in order to forget Elysium.

**LETO**. See LATONA.

**LETRONNE, Antoine Jean**, a French archaeologist, born in Paris, Jan. 25, 1787, died there, Dec. 14, 1848. From the age of 14 he supported his mother and aided his brother to complete his studies as a painter; and while yet a youth became well known among the learned by his numerous restitutions of disputed passages in classic writers. In 1810-'12 he travelled in France, Italy, and Switzerland, and after his return his edition of the work of Dicuil on the measurement of the earth, and an article on the Pausanias of Clavier, caused him to be chosen by government to complete the translation of Strabo, begun by Laporte-Dutheil. He was appointed inspector general of the university in 1819, and professor of history in the collège de France in 1831. In 1832 he became keeper of antiquities in the royal library. In 1838 he was appointed administrator of the collège de France and professor of archaeology, and in 1840 succeeded Daunou as keeper of the archives of the kingdom. He distinguished himself by his refutation of the assertions of Dupuis and others relative to the "zodiacs" discovered at Esne and Denderah, in which he showed that, instead of belonging to an inconceivably remote antiquity, they were no older than the days of the Cæsars. His great work, the *Recueil des inscriptions grecques et latines de l'Égypte* (2 vols. 4to, Paris, 1842, 1848), was unfinished at the time of his death.

**LETTER OF MARQUE.** See PRIVATEER.

**LETTIC RACE,** a northwestern subdivision of the Letto-Slavic or Slavo-Lettic group of the Aryan or Indo-European family, embracing the Lithuanians, Old Prussians, and Letts. The Lithuanians, the inhabitants of the ancient grand principality of Lithuania, are distinguished as Lithuanians proper, who occupy the eastern portion of the Russian governments of Kovno, Wilna, Courland, and Grodno, and number about 750,000; Samogitians or Shamaites, who inhabit ancient Samogitia, now mainly comprised in the government of Kovno, numbering about 500,000; and Prussian Lithuanians, of the N. E. portion of East Prussia, numbering about 150,000. The Old Prussians have been Germanized, and their language has been extinct since the 17th century; they inhabited the Baltic region between the Vistula and the Niemen. The Letts inhabit principally Courland, Vitebsk, and Kovno; a few hundreds are found also in the governments of Pskov and St. Petersburg; their number is estimated at about 1,000,000.—The Lithuanian language has several dialects, of which the principal are the Lithuanian proper, or High Lithuanian, the Samogitian, and the Prussian Lithuanian. It is of great interest to the students of the Aryan languages on account of the large number of archaic forms which it has preserved. Though several religious books, as translations of the Bible, hymn books, and catechisms, have been printed in it, the Lithuanian language has no literature proper. The Lithuanians possess a large mass of songs (*dainos*), proverbs, and riddles, which have lately been gathered and published by Rhesa, Nesselmann, Schleicher, and others. In the last century a Lithuanian clergyman, Christian Donaleitis, composed several charming little poems. The Lettish language is of a more modern origin. It is heard in the purest form near Mitau, where recently several books have been published in it. The first printed Lettish book was a Lutheran catechism, which appeared in 1586. Several religious works have since appeared, and during the last 50 years an attempt has been made to translate into Lettish several popular German idyls and fairy tales. A national Lettish literature is not entirely wanting. There have been composed in it several lyrical poems and plays by native authors, and several periodicals, mostly written by clergymen, are issued. The Old Prussian language is but little known. Nesselmann has made a collection of the last remains of it. (See LITHUANIA, and SLAVIC RACE AND LANGUAGES.)

**LETTRES DE CACHET.** See CACHET, LETTRES DE.

**LETTUCE,** a plant of the natural order *compositae*, the leaves of which are largely used as a salad. It has been cultivated in England for over 200 years, and has been known from the earliest times; hence, as is the case with many cultivated plants, its native country is uncertain; Alphonse de Candolle (*Géographie bo-*

*tanique raisonné*) says that he knows of no locality in which the plant appears to be really spontaneous, and he thinks it probable that the cultivated lettuce, usually called *lactuca sativa*, is only a form of the widely distributed *L. scariola*. Lettuce is an annual, at first forming a more or less compact cluster of leaves, or a head, which are exceedingly crisp and tender; as the plant grows older it secretes an abundant, milky, bitter juice, and rapidly pushes up a flower stalk, 2 to 4 ft. high, which has numerous branches, the subdivisions of which are terminated by small heads of pale yellow ligulate flowers. The varieties in cultivation are numerous, new ones being offered every year; these varieties are divided into two principal groups: the cabbage lettuces, which have rounded leaves and form a compact head like that of a cabbage, and the cos lettuces, which have firm and oblong leaves forming a long, erect head, largest above and tapering below. The seeds in some varieties are white, and in others yellow, brown, or black; some varieties produce white and black-seeded sub-varieties; such is the tendency to vary that each gardener largely engaged in lettuce growing, by careful selection of plants for seed-bearing, soon establishes a subvariety or strain suited to his soil. Among the leading varieties are the Silesian, tennis-ball, and drumhead; the curled India is best for summer crops, and the Dutch and hardy green for wintering over. In the family garden lettuce is sown in the spring, transplanted when large enough, and consumed as it comes to perfection. Those who supply the markets pursue a very different method, as they must have it every month in the year. In some localities large areas are covered by the sashes of the salad growers, who by the use of fermenting manure produce crops all through the winter. Latterly pits or low greenhouses heated by hot water have been used for this purpose. The hot months



Cabbage Lettuce.

of summer present the greatest difficulty to the lettuce grower, as the plants run up to seed too soon, though some varieties do this less readily than others. In the vicinity of New York many families are supported solely by the cultivation of this plant, with perhaps radishes in

the spring. Dietetically, lettuce can hardly be considered as nutritive, but it is probably a bland corrective of grosser food. When its milky juice becomes developed it is no doubt a sedative, and it may act as such on very susceptible persons before the principle becomes



Cos Lettuce.

sufficiently abundant to make the lettuce unpleasantly bitter. It is a little singular that a plant which contains little or no nutriment should be of such general consumption over the greater part of the world.—Lactucarium or lettuce opium is the name given to the inspissated juice of the lettuce. The soporific effects of lettuce were known in early times, but Dr. J. R. Coxe of Philadelphia was the first to call the attention of the medical profession to the dried juice as a remedial agent. It has had a variable reputation, probably on account of the uncertain character of the lactucarium found in the market. If prepared, as is the practice in some parts of Europe, by expressing the juice from the lettuce and evaporating it, it is of doubtful efficacy. The best is collected by cutting the flower stalks and receiving the milk as it exudes upon pieces of cotton cloth; these when fully charged are placed in a vessel of water until the juice is dissolved out, and the solution then evaporated to the consistence of an extract. Lactucarium has a peculiar and a bitter taste. It has the anodyne properties of opium, but in a much less degree, and does not like that drug derange the digestion and produce constipation. On account of its uncertain quality as found in commerce, the dose varies from 5 to 20 grains.

**LEU, August Wilhelm**, a German painter, born in Münster in 1819. He studied in Düsseldorf, and became distinguished as a landscape painter and as a professor in the Düsseldorf academy. His works include admirable specimens of the mountain scenery of Norway, where he spent some time. He also collected rich materials in the picturesque regions of Bavaria, Austria,

Switzerland, and Italy. He is alike successful in delineating the sombre winter and the bright summer aspects of northern scenery.

**LEUCADIA.** See SANTA MAURA.

**LEUCHTENBERG**, a mediatised principality of Bavaria, in the district of the Upper Palatinate; area, about 80 sq. m.; pop. about 6,500. Capital, Pfreimdt (pop. 1,600). It took its name from a lofty castle still existing in the village of the same name, which was the cradle of landgraves whose male line became extinct in 1646 with the death of Adam Maximilian. His brother-in-law, Duke Albert, succeeded to the domain in 1647, but relinquished it in favor of his brother the elector Maximilian of Bavaria, who ceded it to his second son Maximilian Philip. After various changes it was reunited with Bavaria in 1714. In 1817 King Maximilian Joseph ceded it for 5,000,000 francs, together with a portion of the principality of Eichstädt, to his son-in-law Eugène de Beauharnais, conferring upon him the titles of duke of Leuchtenberg and prince of Eichstädt, with the right of succession to the sovereignty in the event of the extinction of the male line of Bavarian kings. (See **BEAUHARNAIS, EUGÈNE DE**).—The successor of Eugène, his elder son **CHARLES AUGUSTE EUGÈNE NAPOLEON** (1810–35), dying two months after his marriage with Queen Maria of Portugal, Leuchtenberg reverted to his brother **MAX EUGÈNE JOSEPH NAPOLEON** (born in Munich, Oct. 2, 1817, died in St. Petersburg, Nov. 1, 1852). He married in 1839 the grand duchess Maria, daughter of the emperor Nicholas of Russia. He received the title of imperial highness, and his four sons that of Princes Romanovski. The eldest of the latter, **Duke NICHOLAS MAXIMILIAN** (born in St. Petersburg, Aug. 4, 1843), is the present head of the house of Leuchtenberg and the owner of the Russian domain of Tambov, which his family acquired in 1845 after the sale of their property in the Papal States for 20,000,000 francs to the Roman see. The mother of Duke Nicholas, the grand duchess Maria, contracted a second marriage with the Russian count Grigori Stroganoff, Nov. 16, 1856. The duke is a major general on the staff of the emperor Alexander II., and was in attendance on him when attempts upon Alexander's life were made in St. Petersburg in 1866, and in Paris in 1867. In 1873 he was aide-de-camp to Gen. Kaufmann in Khiva.

**LEUCIPPUS**, a Greek philosopher, who probably lived in the 5th century B. C. Elea, Abdera, and Miletus alike claimed to be his birthplace. He is said to have been the disciple of Pythagoras, Melissus, and Zeno, and the teacher of Democritus, who learned from him the first principles of the atomic theory, of which he is generally recognized as the originator. No details concerning his life have been preserved, and none of his writings have come down to us, with the exception of a few fragments of a treatise "On Mind," preserved by Stobæus.



**LEUCKART, Karl Georg Friedrich Rudolph**, a German zoölogist, born in Helmstedt, Oct. 7, 1823. He graduated at Göttingen in 1845, and in 1850 became professor of zoölogy, and in 1855 also of comparative anatomy, at Giessen. He is especially distinguished as a helminthologist. His principal works are: *Die Blasenbandwürmer und ihre Entwickelung* (Giessen, 1856); *Untersuchungen über Trichina spiralis* (Leipsic, 1861); and *Die Parasiten des Menschen und die von denselben herrührenden Krankheiten* (2 vols., Leipsic, 1863-'6).

**LEUCOTHEA.** See INO.

**LEUCTRA**, a village of Bœotia, ancient Greece, between Thespiæ and Plataea, celebrated for a victory obtained in its vicinity in 371 B. C. by the Thebans over the Spartans. (See EPAMINONDAS.) Leuctra had ceased to exist even in the age of Strabo, but its site is still clearly marked by a tumulus which occupies an eminence S. of the Thespian vale, and which is supposed to be the place of sepulture of the 1,000 Spartans who fell in the battle.

**LEUK** (Fr. *Louèche*), a small town of Switzerland, in the canton of Valais, on the right bank of the Rhône (which is here crossed by a bridge connecting with the road on the Simplon), 15 m. N. E. of Sion; pop. about 1,200. It contains picturesque ruins and several churches. About 5 m. N. of Leuk is Lenkerbad (Fr. *Louèche-les-Bains*, pop. 600), with many hot springs, situated on the torrent Dala, at the foot of the Gemmi, about 4,600 ft. above the sea. The general temperature of the springs varies from 117° to 124°. They contain some saline matter, but are chiefly beneficial on account of their heat, though the water is slightly cooled before being used. Both sexes bathe together in large basins, wrapped up in thick woollen cloaks, and at the beginning of the cure remain continuously in the water every day from two to four hours. The springs were known in the 12th century. In the vicinity are the famous eight ladders at the foot of a precipice called the Wandfluh, which are placed almost perpendicularly against the face of the cliff.

**LEURET, François**, a French anatomist, born in Nancy, Dec. 29, 1797, died there, Jan. 6, 1851. At the end of a year after commencing his medical studies, his father being unable to supply him with means of further support, François in despair enlisted as a private soldier. His regiment being stationed in France, he attended the lectures of Esquirol. A fellow student procured his discharge from the army, and obtained a situation for him as paid assistant in the insane hospital of Royer-Collard at Charenton. In a few months he was appointed one of the *internes* of that institution, and before receiving his degree published several medical essays, one of which received the approval of the academy of sciences. In 1826 he took his degree and returned to Nancy to practise, but in less than a year he went back to Paris, became the assistant of Esquirol, and

was installed as editor of the *Annales d'Hygiène et de Médecine légale*. In 1831 he published an essay on the cholera of that year. In 1832, in connection with two of his friends, he published a series of observations on the frequency of the pulse in the insane, and another on measurements of the head. In 1834 appeared his *Fragments psychologiques*, a work which gained for him a high reputation. In 1839 he published *Anatomie comparée du système nerveux considéré dans ses rapports avec l'intelligence*, and in 1840 *Traitement moral de la folie*, which raised him at once to the first rank among modern psychologists, and led to his appointment as director-in-chief of the Bicêtre. In *Des indications à suivre dans le traitement moral de la folie* (1846), some of his earlier opinions were modified.

**LEUTHEN**, a village of Prussian Silesia, about 10 m. W. of Breslau; pop. about 1,000. It is noteworthy as the scene of one of the great victories achieved by Frederick the Great over the Austrians in the seven years' war (Dec. 5, 1757). (See FREDERICK II. of Prussia.)

**LEUTSCHAU** (Hung. *Lőcse*), a royal free city of Hungary, capital of the county of Zips, 125 m. N. N. E. of Pesth; pop. in 1869, 6,887. It has an old Roman Catholic church with a celebrated organ, a Catholic and a Lutheran gymnasium, and a Franciscan convent. Leutschau was founded in 1245, and was formerly the richest and most flourishing town and one of the most important fortresses of Upper Hungary; but it greatly declined in consequence of the civil wars of the 17th century.

**LEUTZE, Emanuel**, an American painter, born in Gmünd, Württemberg, May 24, 1816, died in Washington, D. C., July 18, 1868. His parents emigrated in his infancy to Philadelphia, where his youth was passed. It was while attending at the sick bed of his father that he first attempted drawing. His first success in painting was a picture representing an Indian gazing at the setting sun, which procured him so many orders that in 1841 he was able to carry into effect a long cherished desire to study his art abroad. He went to Düsseldorf, and became one of the pupils of Lessing, under whom he made rapid progress. His first work in Europe, "Columbus before the Council of Salamanca," was purchased by the Düsseldorf art union; and a picture representing Columbus in chains procured him the medal of the Brussels art exhibition. In 1843 he studied at Munich, and finished there his "Columbus before the Queen." After a stay in Venice and Rome, he in 1845 returned to Düsseldorf, where he married and chiefly resided till 1859, when he returned to the United States. Among his best works are "The Landing of the Norsemen in America," "Cromwell and his Daughter," "The Court of Queen Elizabeth," "Henry VIII. and Anne Boleyn," "The Iconoclast," &c., some of which are of large dimensions. In the United States he is known by his "Washington crossing the Delaware," "Washington at Mon-

mouth," "Washington at the Battle of Monongahela," "News from Lexington," "Sergeant Jasper," and "Washington at Princeton." The "Washington crossing the Delaware" has been engraved. Among his latest works is "Westward the Star of Empire takes its Way," a large picture for one of the staircases in the capitol at Washington.

**LE VAILLANT, François**, a French traveller, born in Paramaribo, Dutch Guiana, in 1753, died at Sézanne, France, Nov. 22, 1824. His father, a merchant and consul at Paramaribo, returned to Europe when his son was 10 years of age. For several years he studied natural history, and in order to study the habits of birds in nature went to the Cape of Good Hope, where he arrived March 29, 1781. After making an expedition into the interior of Africa, penetrating as far N. as the tropic of Capricorn, he returned to Paris in 1785, and published a narrative of his adventures in two successive works: *Voyage dans l'intérieur de l'Afrique, de 1781 à 1783* (Paris, 1790), and *Second voyage dans l'intérieur de l'Afrique* (Paris, 1796). His African adventures were greatly though unjustly discredited. Though not concerned in politics, he was arrested as *suspect* in 1793, and owed his escape from death to the downfall of Robespierre. He passed the remainder of his life on a small estate in Champagne, and published during this time 12 volumes, mostly folio, on the birds of Africa, in magnificent style with costly illustrations. A part of his valuable collection of animal specimens was purchased by the French government, and the rest was sold in Holland.

**LEVANT**, a term used by the seafaring and commercial people of the countries bordering on the Mediterranean to designate the portion of that sea which washes the shores of Asia Minor and Syria, and the ports of Smyrna, Alexandretta, Beyrout, Acre, &c., which in the local dialect are called *Scale di Levante*. The heterogeneous population of those parts, who speak in their intercourse with Europeans the language known as the *lingua Franca*, are styled Levantines. The term *Levante*, which in Italian signifies "the East," was first used by the Venetians and Genoese. It is sometimes used in a broader sense, and applied to all the regions east of Italy, as far as the Euphrates and the Nile.

**LEVÊQUE, Jean Charles**, a French philosopher, born in Bordeaux, Aug. 7, 1818. After teaching philosophy in the colleges at Angoulême, Besançon, Athens, Toulouse, and Nancy, he was called in 1856 to the collège de France at Paris, where in 1861 he succeeded Barthélemy Saint-Hilaire as titular professor of Greek and Latin philosophy. In 1865 he became member, and in 1873 vice president of the academy of moral and political sciences. Several French academies have awarded prizes to his principal work on æsthetics, *La science du beau étudiée dans ses principes, ses applications et son histoire* (2 vols., 1860).

**LEVER.** See MECHANICS.

**LEVER, Charles James**, an Irish novelist, born in Dublin, Aug. 31, 1806, died in Trieste, June 1, 1872. He was educated as a physician, studying first at Trinity college and afterward in Göttingen. In 1832, during the prevalence of the cholera in Ireland, he was appointed medical superintendent of an extensive district comprising Londonderry and other places, and treated the disease with remarkable success. In March, 1834, he sent the first chapters of "The Confessions of Harry Lorrequer" to the "Dublin University Magazine." As the tale became more popular each month, he worked with renewed energy, but kept his secret from even his brother. Notwithstanding its success, he did not at first think of adopting letters as a profession, but continued his medical practice till 1837, when he received the appointment of physician to the British embassy at Brussels. Here he finished "Harry Lorrequer," and accepting as true the favorable judgment of the public concerning it, he adopted the title as his pseudonyme, and devoted himself to literature. This work, remarkable for vivacity and rollicking humor, fulness of incident, ever-shifting scenes, and happy pictures of Irish life and manners, was the precursor of a large number of novels distinguished chiefly by the same characteristics. In many of these the incidents and characters are connected with the military profession, and the favorite type of a hero is a young dragoon or guardsman full of animal spirits and love of adventure, not a few of whose exploits are said to be founded on the personal experience of the author, who in his youth was noted for his daring spirit and his skill in riding and breaking horses. In March, 1840, "Charles O'Malley, the Irish Dragoon," was begun in the "Dublin University Magazine." In April, 1842, Lever accepted the editorship of the magazine, and fixed his residence in the neighborhood of Dublin; but after three years the work became distasteful to him on account of the political strife engendered by the position, and he resigned and retired to the continent. After spending a short time in the Tyrol, he established himself in Florence. In 1858 he was appointed by Lord Derby vice consul at Spezia, and in 1867 was transferred to Trieste as consul, which post he held until his death. The university of Dublin conferred on him the degree of LL. D. in 1871. Lever's later works exhibit a marked improvement over his earlier productions, being more artistic and thoughtful, and less dependent on startling incidents. Some of them contain admirable sketches of character. His principal novels are: "Harry Lorrequer" (1840); "Charles O'Malley" (1841); "Jack Hinton" (1843); "Tom Burke of Ours" (1844); "Arthur O'Leary" (1844); "The O'Donoghue" (1845); "St. Patrick's Eve" (1845); "Tales of the Trains" (1845); "The Knight of Gwynne" (1847); "Diary and Notes of Horace Templeton" (1849);

"Roland Cashel" (1849); "The Daltons" (1852); "The Dodd Family Abroad" (1854); "Maurice Tierney" (1855); "Sir Jasper Carrew" (1855); "Con Cregan, the Irish Gil Blas" (1857); "Glencore and his Fortunes" (1857); "The Martins of Cro' Martin" (1859); "Davenport Dunn" (1859); "Gerald Fitzgerald" (1860); "One of Them" (1861); "A Day's Ride" (1861); "Barrington" (1862); "Luttrell of Arran" (1865); "Sir Brooke Fossbrooke" (1867); "The Bramleighs of Bishop's Folly" (1868); "That Boy of Norcott's" (1869); "Paul Gosslett's Confessions" (1870); "A Rent in the Cloud" (1870); and "Lord Kilgobbin" (1872). He was the author also of a number of shorter stories and of several unacknowledged works.

**LEVERETT, Frederiek Perival**, an American scholar, born in Portsmouth, N. H., Sept. 11, 1803, died in Boston, Oct. 6, 1836. He was a descendant of Sir John Leverett, one of the governors of the colony of Massachusetts. He graduated at Harvard college in 1821, and was appointed the same year an usher in the public Latin school of Boston, of which he became successively sub-master and principal, and afterward opened a private classical school. He published editions of Cæsar's "Commentaries," Juvenal, and the *Viri Romæ*, to be used as text books in schools, and also a "New Latin Tutor." His principal work was his "Lexicon of the Latin Language, compiled from the Lexicons of Faccioliati and Forcellini, Scheller, Lünemann, and Freund" (Boston, 1837), of which the last sheet went to press on the morning of his death.

**LEVERETT, Sir John**, colonial governor of Massachusetts, born in England in 1616, died in Boston, March 16, 1679. At the age of 17 he emigrated to America with his father, and settled in Boston. He returned to England in 1644, took part in the struggle between the parliament and the king, and as commander of a company of foot soldiers gained military distinction and the friendship of Cromwell. He resided some years at the court of the protector, as agent of Massachusetts. On his return to America he held successively some of the most important civil and military offices in the gift of the colony, and finally in 1673 was elected governor. His administration is important in colonial history as the era of the war with King Philip, which Gov. Leverett's skill and energy were instrumental in conducting to a fortunate issue. In 1676 he was knighted by Charles II. in acknowledgment of his services to the New England colonies during this contest. He died in office.—**JOHN**, his grandson, born in Boston, Aug. 25, 1662, was an eminent lawyer and judge, speaker of the legislature, member of the royal society, and president of Harvard college from 1708 until his death, May 3, 1724.

**LEVERRIER, Urbain Jean Joseph**, a French astronomer, born in St. Lô, March 11, 1811. He studied successively at the college of St.

Lô, at Caen, and at the college of Louis le Grand in Paris, and graduated at the polytechnic school. He then obtained a place in the tobacco bureau, and as his new occupation required some knowledge of chemistry, he pursued that science at leisure, and published in 1837 two memoirs on the combinations of phosphorus with hydrogen and oxygen. He devoted himself, however, principally to mathematics, and soon obtained a minor appointment in the polytechnic school. From this time he studied continually the highest problems in speculative astronomy, investigating especially the irregularities manifested in the course of the heavenly bodies. Two memoirs on this subject, supporting the observations of Lagrange, and asserting that the masses of the planets Jupiter, Saturn, and Uranus were sufficient to insure the stability of the solar system, were submitted in 1839 to the academy of sciences. These and some other writings attracted the friendship of Arago, who induced him to study closely the orbit of Mercury and its perturbations. In 1844 he presented to the academy a theory of the periodical comet of 1770, and a paper on that of 1843. These contributions to science obtained for him admission to the academy of sciences, to the astronomical section of which he was elected, Jan. 19, 1846. The success which had attended his calculations of the course of Mercury induced him to revise the still more imperfect tables of Uranus. His studies on this subject convinced him that the movements of this planet could not be explained by the attraction of any known bodies, and he accordingly sought further for the cause of its perturbations. Finally, on June 1, 1846, he indicated to the academy of sciences within 10° the place where a new planet might be seen on Jan. 1, 1847. This was in fact done by the German astronomer Galle, who discovered it, however, Sept. 23, 1846. Leverrier had made an error, but only of 2°. The sensation excited by this discovery was immense, and Leverrier received abundant honor. The king of Denmark sent him the order of the Danebrog; most of the academies of Europe inscribed his name on their lists; Salvandy, the minister of public instruction in France, had his bust erected in public with great ceremony; Arago declared that the new planet should be called Leverrier; a chair of mathematical astronomy was created for him in the faculty of sciences; the royal society of England sent him the Copley gold medal, and the grand duke of Tuscany a splendidly bound copy of the works of Galileo. It is true that the planet only bore for a time the name of Leverrier, that of Neptune being subsequently given to it, but even this honor could hardly have added much to the renown of one whose name is so closely identified with it. The priority of discovery was however contested in favor of a distinguished young English geometer at St. John's college, Cambridge, Mr. Adams, who had arrived

at the same conclusion about the same time, but who was less fortunate than his French rival in making it known to the world. (See ADAMS, JOHN COUCH.) In 1848 Leverrier made some ineffectual efforts to distinguish himself as a democratic leader, but it was not till 1849 that he was elected from La Manche to the legislative assembly. He modified his liberal views, took his place among the counter-revolutionary members, and occupied himself principally with questions of public instruction and with laws relative to scientific discoveries. He was in consequence appointed to prepare several important reports relative to the construction of electric telegraphs, the organization of the polytechnic school, and recruiting for the corps of engineers. When a decided division into parties took place in the assembly, Leverrier joined the imperialists. After the *coup d'état* of Dec. 2, 1851, he was appointed senator, and some time after inspector general of public instruction. He exerted a decided influence on public instruction in France, particularly with regard to the polytechnic school. In 1849-50 he read to the academy of sciences an account of new investigations into the movements of the planets, and in 1853 presented to it tables of the sun's rotation, with the complete system of the small planets situated between Mars and Jupiter. In 1853, on the death of Arago, Leverrier succeeded to the title and authority of director of the observatory. During his tenure of this office he was much occupied in urging upon government a reform of the old method of observations, which caused much dispute between himself and his colleagues. In September, 1859, he communicated to the academy of sciences a movement of the perihelion of Mercury, which could be accounted for only by the supposition of another planet, or perhaps a series of small bodies, moving between it and the sun. This communication called forth Dr. Lescarbault's revelation of a discovery which he asserted that he had made at Orgères as early as March 25, 1859, of a new planet, which received the name of Vulcan, and which was announced through Leverrier to the academy of sciences in the beginning of 1860. But subsequent researches have failed to establish the existence of such a planet. On June 3, 1861, Leverrier communicated to the academy of sciences a letter on the constitution of the planetary system, and on the theory and tables of Mars. The following are the results presented in this paper: 1. There is between Mars and the sun a ring of asteroids whose united mass is comparable to that of Mercury. 2. At the distance of the earth from the sun there is a second ring of asteroids, whose mass is nearly equal to the 10th part of that of the earth. 3. The united masses of the asteroids between Mars and Jupiter is nearly equal to the third part of the mass of the earth. 4. The masses of the last two groups are complementary to each other. Ten times

the mass of the group at the earth's distance added to three times the united mass of the zone between Mars and Jupiter is nearly equal to twice the mass of the earth. In 1870 Leverrier found it desirable to withdraw from the office of director of the observatory, differences having arisen between himself and other eminent astronomers. Delaunay succeeded to the post, which he retained till his death by drowning, Aug. 5, 1872, soon after which Leverrier was reappointed. Shortly before this he had published an important memoir on the theories of the four exterior planets. This is noteworthy as in part withdrawing the ideas promulgated in the paper of 1861, above mentioned. "It has been proved," says Leverrier, "that the matter of which no account had hitherto been taken in the theory of Mars ought to have been added to the earth itself, the estimate of the mass of our planet being one eighth too small." This of course relates to the recognition of the fact that the sun's distance is not so great as has been supposed. For the diminution of the sun's distance and of all the distances within the solar system (save the moon's alone), in the proportion of about 143 to 149, corresponds to the reduction of the relative masses of the sun and all the planets as compared with the earth in the proportion of  $(143)^3$  to  $(149)^3$ , or roughly as 137 to 155; which is the same as saying that the earth's mass is increased relatively in the proportion of 155 to 137, or by about an eighth part. "With regard to Mercury," Leverrier proceeds, "this confirmation is not yet complete. Several astronomers have placed on record the passage over the sun's disk of various small bodies, which could be nothing else but very small planets, but it has not been possible to determine the orbit of any one of them. Whether we have to deal with the action of a certain number of small masses, or with that of matter distributed in the neighborhood of the sun, the theory of Mercury has been determined with considerable care, and the transits of the planet over the sun's disk furnish us with observations too precise to admit of any doubt of the accuracy of our results, especially as they have been obtained in the same manner as for Mars; and for this latter planet the confirmation which the theory has received leaves nothing more to be desired." He then recommends corresponding researches into the theory of the four large planets, as they would furnish us with data concerning any matter still unknown to us that may be situated in those regions. It is probable that the greater part of Leverrier's time will hereafter be given to this important subject.

**LE VERT, Octavia Walton**, an American authoress, born near Augusta, Ga., about 1810. She is a granddaughter of George Walton, one of the signers of the Declaration of Independence. Her father removed to Pensacola in 1821, having been appointed territorial secretary for Florida, under Gen. Jackson as gov-

error. On the retirement of Jackson Mr. Walton acted for a time as governor. Although his daughter's education was exclusively domestic and confined to Pensacola, she became a proficient in the French, Spanish, and Italian languages, and obtained some knowledge of Latin and Greek, as well as of the sciences. She spent the winter of 1833-'4 in Washington, and during the debates upon the removal of the deposits was in the habit of writing such accurate reports that, it is said, Clay, Calhoun, Webster, McDuffie, and Preston were all in the habit of calling to read their own speeches from her portfolio. In 1836 she was married to Dr. Henry S. Le Vert, a physician of Mobile. She made two visits to Europe, the results of which have been given to the world in her "Souvenirs of Travel" (2 vols., New York, 1857). In 1874 she made her appearance as a public reader.

**LEVI**, the third son of Jacob and Leah, born in Mesopotamia. He and his brother Simeon caused the massacre of the Shechemites and the pillage of their city to avenge the wrong done to their sister Dinah. This action displeased their father Jacob, and the descendants of Levi therefore had no allotment in the division of Canaan, and were dispersed among the other tribes. The Levites were, however, set apart for the sacerdotal office, and were endowed with privileges and dignities above the other tribes. Moses and Aaron were of this tribe.

**LEVI, Leone**, a British author, born in Ancona, Italy, June 6, 1821. He was educated for mercantile pursuits, and in 1844 went to England, and in 1847 was naturalized as a British subject. In 1849 he was mainly instrumental in organizing the Liverpool chamber of commerce, of which he became honorary secretary. In 1852 he was permitted to give evening lectures on commerce and commercial law in King's college, London, where he was afterward appointed professor of the principles and practice of commerce. He was called to the bar in 1859, and in 1861 was made doctor of political and economical science by the university of Tübingen. His principal publications are: "Commercial Law" (4 vols. 4to, 1850-'52); "The Law of Nature and Nations, as affected by Divine Law" (1855); "On Taxation: how it is Raised and how it is Expended" (1860); "International Commercial Law" (1864); and "History of British Commerce" (1872).

**LEVIATHAN**, the English form of a Hebrew word (*livyathan*) used in the Old Testament, probably applicable to any huge marine animal, and sometimes, as in Job xli., perhaps designating particularly the Egyptian crocodile.

**LÉVIS**. I. A. S. county of Quebec, Canada, bounded N. by the St. Lawrence river, opposite Quebec; area, 256½ sq. m.; pop. in 1871, 24,831, of whom 22,706 were of French and 1,290 of Irish origin or descent. It is watered by the Chaudière river, and traversed by the Grand Trunk railway. II. Or **Point Levi**, a

town, capital of the county, on the S. shore of the St. Lawrence, opposite Quebec, and at the terminus of the Grand Trunk railway; pop. in 1871, 6,691. It is the landing place for passengers arriving by steamer from Europe, and has an extensive shipping trade. It contains two telegraph offices, and several saw mills and factories.

**LEVITA, Elias**. See ELIAS LEVITA.

**LEVITES**, in a general sense, all the descendants of Levi; more particularly those who were employed in the lower services of the temple, as distinguished from the priests, who were of the family of Aaron, a branch of the same tribe. Subordinate to the priests, it was their office in the desert to carry the hangings, the ark, and sacred vessels of the tabernacle, and the materials which composed it. Subsequently part of them attended at the tabernacle, while the others were distributed among 48 cities which were allotted to them in Canaan, and were the ordinary judges of the country. Five of these cities, Hebron, Shechem, Golan, Kedesh, and Ramoth-Gilead, were cities of refuge. Besides other means of subsistence, they had a tenth of the produce of the lands belonging to the other tribes. They were divided into three classes, named, after the three sons of Levi, Gershonites, Kohathites, and Merarites. In the time of David they numbered 38,000 men fit for official service, of whom 24,000 were "set over the work of the Lord," 6,000 were officers and judges, 4,000 musicians, and 4,000 porters.

**LEVITICUS**, the third book of the Pentateuch, and of the Old Testament canon, containing the legislation and regulations concerning the duties of priests and Levites, and the ceremonies of worship. The offering of sacrifices, the consecration and authority of priests, the distinction of things clean and unclean, the feast of atonement, the prohibition of idolatry, theft, perjury, divination, and other crimes, the religious festivals, and the sabbatical and jubilee years, are chiefly treated in the book. (See PENTATEUCH.)

**LEVY**, a N. W. county of the peninsula of Florida, on the gulf of Mexico, bounded N. W. by the Suwanee river, and S. by the Withlacoochee; area, 860 sq. m.; pop. in 1870, 2,018, of whom 395 were colored. The surface is low and swampy, and abounds with valuable timber. The Florida railroad passes through it. The chief productions in 1870 were 26,590 bushels of Indian corn, 11,380 of sweet potatoes, 273 bales of cotton, 16 hogsheads of sugar, and 3,630 gallons of molasses. There were 296 horses, 2,407 milch cows, 5,407 other cattle, and 2,258 swine. Capital, Levyville.

**LEVY, Émile**, a French painter, born in Paris, Aug. 29, 1826. He studied under Abel de Pujol and Picot, and in 1854 won at the school of fine arts the great Roman prize. At Rome he executed his "Noah cursing Canaan," which was purchased by the government in 1855. Among his subsequent works are: "The Re-



past of the Martyrs" and "Ruth and Naomi" (1859); "Bringing in the Hay" (1861); "Veringetorix surrendering to Cæsar" (1863); "Idyl" (1864); "Diana" (1865); "Death of Orpheus" (1866); "The Rainbow" (1868); "Music" (1869); and "Christ at the Sepulchre" (1873). He received the cross of the legion of honor in 1867.

**LEWALD. I. Johann Karl August**, a German author, born in Königsberg, Oct. 14, 1792, died in Munich, March 10, 1871. He passed from the gymnasium to a mercantile house, accompanied the Russian general Rosen as secretary in the campaigns of 1813-'15, and subsequently in his travels through Europe. In 1817 he became associated at Breslau with Schell and Holtei, with whom he wrote the comedy *Der Grosspapa*. He was for nine years connected as actor or director with the theatres at Brunn, Munich, Nuremberg, and Bamberg, and he was afterward for four years stage manager at Hamburg. After visiting Paris and Italy a second time, he established himself in 1834 at Stuttgart, where he founded the journal *Europa*, which he edited for 12 years. In 1850 he became one of the editors of the *Deutsche Chronik*, a conservative journal, and shortly after he joined the Roman Catholic church. From 1849 to 1862 he was stage manager of the court theatre in Stuttgart. In the latter year he was pensioned, and retired to Munich, where he resided until his death. His works comprise novels, translations, critical essays, and sketches of travel. Most of them are contained in his *Gesammelte Werke* (12 vols., Leipsic, 1844-'5). His latest productions are: *Tornisterbüchel* (Schaffhausen, 1861); *Der Insurgent* (1865); *Inigo, eine Bilderreihe aus dem Leben des heiligen Ignatius von Loyola* (1870); and *Letzte Fahrten* (Mentz, 1871). **II. Fanny**, a German authoress, cousin of the preceding, born in Königsberg, March 24, 1811. Her father, a prominent Jewish merchant, consented to her embracing Christianity in 1828, and made her his companion in his travels. In 1834 she wrote some fairy tales. At the suggestion of her cousin she wrote her first novel for his *Europa* (1841), and in the following four years she published anonymously a series of novels indicating her sympathies with social and political reforms. While in Italy in 1845, where her father died, she became intimate with Adolf Stahr, a distinguished German author, and married him ten years later at Berlin, their place of residence, retaining however her maiden name for her publications. She described her travels in *Italienisches Bilderbuch* (2 vols., Berlin, 1847) and *Reisetagebuch aus England und Schottland* (2 vols., Brunswick, 1852), and wrote in the short space of a few days *Diogena, Roman von Idu-na Gräfin von H. H.* (2d ed., Leipsic, 1847), a satire against Countess Hahn-Hahn, the novelist, which had a great success. Among her other works are: *Prinz Louis Ferdinand* (3

vols., Breslau, 1849; 3d ed., 1869); *Wandlungen* (3 vols., Brunswick, 1853); *Neue Romane* (5 vols., Berlin, 1858-'61); the village story *Das Mädchen von Hela* (2 vols., 1860); her autobiography, *Meine Lebensgeschichte* (6 vols., 1861); and the novel *Von Geschlecht zu Geschlecht* (8 vols., 1863-'5). She also wrote the most interesting portion of her husband's *Ein Winter in Rom* (2d ed., 1871). In 1869 she joined Jenny Hirsch in editing *Die Frauenwelt*, a periodical devoted to woman's rights, and in 1870 appeared her *Für und wider die Frauen* and *Nella*, in 1871 *Die Unzertrennlichen* and *Pflegeeltern*, and in 1874 *Benedict*. Her collected works have been published in 30 parts (Berlin, 1871 *et seq.*).

**LEWES**, a parliamentary borough and town of Sussex, England, on the Ouse, 42 m. S. of London; pop. of the town in 1871, 10,753. It has a grammar school, almshouses which are believed to have been founded by a daughter of William the Conqueror, a county jail, a theatre, and barracks. It carries on a brisk trade. Here, in 1264, Henry III. was defeated and captured by Simon de Montfort and the barons.

**LEWES. I. George Henry**, an English author, born in London, April 18, 1817. After receiving an unusually varied education, partly in England and partly on the continent, he became a clerk in the office of a Russian merchant. He soon abandoned mercantile life to pursue the study of medicine; and still later he decided to devote himself entirely to literature and philosophy. With this end in view he spent the years 1838-'9 in study in Germany, and on his return to London he at once began an active literary career, gaining an early reputation as a versatile thinker and brilliant writer, especially upon philosophical and scientific subjects. He contributed to the leading reviews, especially to the "Edinburgh," "Westminster," "Foreign Quarterly," and "British Quarterly," and to Blackwood's and Fraser's magazines. In 1849 he assumed the literary editorship of the "Leader" newspaper, founded in that year, and retained it till 1854. He continued to devote himself almost exclusively to the literature of philosophy and science, and many of his investigations of psychological phenomena and kindred subjects excited much attention among scientific men. Among the papers prepared by him in this field of study, the most noteworthy are his essays "On the Spinal Cord as a Centre of Sensation and Volition," read before the British association in 1858, and "On the Nervous System" (three papers, 1859). In 1865 he founded the "Fortnightly Review," of which he was editor until the end of 1866, when he resigned the post because of ill health. The philosophical works by which Mr. Lewes is most widely known are his "Biographical History of Philosophy, from Thales to Comte" (1847; 4th ed., partly rewritten, 2 vols., 1871), in which, while giving a review of the different philosophical systems, he shows his own strongly marked positivist opinions;

and "Problems of Life and Mind," of which but one volume, on "The Foundations of a Creed," has as yet been published (London, 1874). It may be inferred from this volume that Mr. Lewes intends the "Problems of Life and Mind" to include a very full exposition of his own philosophical opinions, and it would seem that he designs it when completed to be the exponent of his matured views. In his philosophical writings throughout, Mr. Lewes has attached but small value to merely metaphysical investigation and conjecture, but has advocated devotion to the study of problems from which results of more positive value may be expected, and to which truly scientific methods may be applied. He maintains, however, in "The Foundations of a Creed," that many problems have been hitherto classed as metaphysical which are really to be investigated by these methods; and advises a new distinction in philosophical study, substituting the terms "empirical" and "metempirical" for "physical" and "metaphysical." Apart from his philosophical works Mr. Lewes's most widely known book is his "Life of Goethe" (1855; new ed., partly rewritten, 1873). His other works, both in philosophy and general literature, include "Ranthorpe, a Tale" (1847); "The Spanish Drama: Lope de Vega and Calderon" (1848); "Rose, Blanche, and Violet," a novel (1848); "Life of Robespierre" (1850); "The Noble Heart," a tragedy (1850); "Comte's Philosophy of the Sciences" (1853); "Seaside Studies" (1858); "Physiology of Common Life" (1860); "Studies in Animal Life" (1861); and "Aristotle: a Chapter from the History of Science," with analyses of Aristotle's scientific writings (1864; new ed., 1873). **II. Marian Evans**, wife of the preceding, an English author, most widely known under her *nom de plume* of GEORGE ELIOT, born in Warwickshire about 1820. Her first work, "Scenes of Clerical Life," originally appeared in "Blackwood's Magazine" in 1857, and was published in book form in London in 1858. It was followed by "Adam Bede" (1859), which at once secured for its author a place among the first of English novelists, and formed the beginning of a series of works each one of which has confirmed Mrs. Lewes in the high position which criticism has almost universally allotted to her. "The Mill on the Floss" appeared in 1860; "Silas Marner" in 1861; "Romola" (first published as a serial in the "Cornhill Magazine" in 1863; "Felix Holt, the Radical," in 1866; and "Middlemarch," the latest and one of the most remarkable of her prose works, in 1871. She translated Strauss's "Life of Jesus" (1846), and Feuerbach's "Essence of Christianity" (1854). Her poetical works are "The Spanish Gypsy" (1868), and "The Legend of Jubal" (1874). Mrs. Lewes was for a time associate editor of the "Westminster Review." Among the highest characteristics of "George Eliot" as a writer of fiction is her remarkable power in the delineation, not so

much of character already formed, as of its development. Almost unconsciously the reader follows every process in the growth of those strong individual types with which her novels are filled, and sees the logical influence of every circumstance and event brought to bear upon their lives. In all of her works the physical and material difficulties to which her actors are subjected, and all those things which ordinarily constitute the "plot" of a romance, are, without losing their interest in any way, made completely subordinate to this leading design of picturing the development of the individual character under different conditions. Thus her novels form some of the best examples in the English language of the true carrying out of the highest purpose of fiction. Hardly less important characteristics are her singular skill in seizing and embodying thoroughly human types of mind and thought, so that each one of her characters becomes a living representative of some traits which every reader recognizes; and her power of terse and almost epigrammatic expression, which places her works among that small number from which expressions pass into popular and current quotation. The subjects of her novels, with the notable exception of "Romola," are generally taken from English village and provincial life.

**LEWIN, Thomas**, an English author, born in 1805. He was educated at Oxford, and became a chancery lawyer and conveyancer. He has published "The Law of Trusts;" "The Life and Epistles of St. Paul" (London, 1851); "Essay on the Chronology of the New Testament" (1854); "Jerusalem, a Sketch of the City and Temple from the earliest Times to the Siege by Titus" (1861); "The Siege of Jerusalem by Titus" (1863); and "Fasti Sacri, or a Key to the Chronology of the New Testament" (1865).

**LEWIS**, in mechanics, an ingenious device for securing heavy blocks of stone to the tackle for hoisting. It is said to be named from Louis XIV., under whom the invention was supposed to have been first employed. In the ruins of Whitby abbey, however, originally founded in 658, there appear in the crown of the heavy keystones of the arches cavities like those now made in such blocks for the lewis. These are quadrangular, and on two opposite sides spread at the bottom as in dovetailing. Three slips of iron are fitted to fill this hole, all together making a wedge form the head of which is at the bottom of the cavity. The three ends projecting out of the stone present each an eye for a bolt, which is passed through the whole, and serves as a handle for lifting the stone. To remove the lewis, the bolt is driven out, and the key or middle one of the three slips, which is a straight rectangular piece of iron, is readily withdrawn, setting the other two free.

**LEWIS**, the name of six counties in the United States. I. A N. county of New York, in-

tersected by Black river; area, 1,288 sq. m.; pop. in 1870, 28,699. The surface toward the east is uneven, broken in many places by low ridges or isolated masses of naked gneiss, and rising gradually to an elevation of 1,400 ft. Toward the west it rises by a series of terraces to a height of from 1,500 to 1,700 ft. The soil is of various qualities. In the E. part it is a light, sandy, unproductive loam; in the W. almost uniformly fertile, with a limestone basis. The Utica and Black River railroad passes through it. The chief productions in 1870 were 33,853 bushels of wheat, 38,414 of Indian corn, 445,667 of oats, 69,828 of barley, 353,016 of potatoes, 32,631 lbs. of wool, 272,815 of hops, 451,326 of maple sugar, 2,080,259 of butter, 977,547 of cheese, and 104,653 tons of hay. There were 6,547 horses, 32,298 milch cows, 10,865 other cattle, 8,384 sheep, and 5,979 swine; 3 manufactories of agricultural implements, 23 of carriages, 41 of cheese, 10 of cooperage, 1 of pig iron, 1 of printing paper, 2 of pumps, 11 of saddlery and harness, 9 of tin, copper, and sheet-iron ware, 3 of woollen goods, 15 tanneries, 4 carrying establishments, 50 saw mills, and 7 flour mills. Capital, Martinsburg. **II.** A N. W. county of West Virginia, drained by the Little Kanawha river and the W. fork of the Monongahela; area, 610 sq. m.; pop. in 1870, 10,175, of whom 196 were colored. The surface is rough and hilly, in some parts mountainous, but fertile near the streams. The chief productions in 1870 were 41,174 bushels of wheat, 191,556 of Indian corn, 31,776 of oats, 16,071 of potatoes, 51,470 lbs. of tobacco, 26,955 of wool, 113,259 of butter, and 8,620 tons of hay. There were 2,515 horses, 2,962 milch cows, 8,136 other cattle, 10,922 sheep, and 5,673 swine. Capital, Weston. **III.** A W. county of Tennessee, drained by tributaries of Duck river; area, 364 sq. m.; pop. in 1870, 1,986, of whom 188 were colored. The surface is uneven, with a fertile soil. The chief productions in 1870 were 6,099 bushels of wheat, 73,315 of Indian corn, 14,356 lbs. of butter, and 120 bales of cotton. There were 329 horses, 443 milch cows, 730 other cattle, 1,676 sheep, and 3,361 swine. Capital, Newburg. **IV.** A N. E. county of Kentucky, separated from Ohio by the Ohio river; area, 300 sq. m.; pop. in 1870, 9,115, of whom 228 were colored. The surface is generally hilly, and the soil fertile. The chief productions in 1870 were 18,632 bushels of wheat, 163,150 of Indian corn, 23,085 of oats, 12,674 of potatoes, 48,807 lbs. of tobacco, 10,069 of wool, and 66,725 of butter. There were 1,430 horses, 1,070 milch cows, 1,816 other cattle, 4,125 sheep, and 5,282 swine; 3 tanneries, 1 carrying establishment, and 4 saw mills. Capital, Clarksburg. **V.** A N. E. county of Missouri, separated from Illinois by the Mississippi river; area, 520 sq. m.; pop. in 1870, 15,114, of whom 1,181 were colored. The surface is diversified, well timbered, very fertile, and of easy cultivation. Limestone underlies part of it, and

coal has been discovered in several places. The Mississippi Valley and Western and the Quincy, Missouri, and Pacific railroads cross it. The chief productions in 1870 were 152,454 bushels of wheat, 30,733 of rye, 526,611 of Indian corn, 347,145 of oats, 35,412 of potatoes, 10,006 lbs. of tobacco, 37,325 of wool, 47,515 of butter, and 14,425 tons of hay. There were 6,304 horses, 1,402 mules and asses, 5,036 milch cows, 1,459 other cattle, 21,133 sheep, and 21,583 swine; 2 manufactories of carriages, 8 of cooperage, 5 of saddlery and harness, 5 of tin, copper, and sheet-iron ware, 1 of tobacco and snuff, 1 flour mill, 2 planing mills, and 1 saw mill. Capital, Monticello. **VI.** A S. W. county of Washington territory, occupied in the E. part by a portion of the Cascade range; area, 1,580 sq. m.; pop. in 1870, 888. It comprises a portion of the valleys of the Chehalis and Cowlitz rivers, and is a fine agricultural region, the W. portion being level or rolling. The rivers are here navigable. It is crossed by the Pacific division of the Northern Pacific railroads. The chief productions in 1870 were 27,304 bushels of wheat, 24,154 of oats, 4,205 of peas and beans, 10,165 of potatoes, 27,325 lbs. of butter, and 1,985 tons of hay. There were 494 horses, 1,809 cattle, 1,956 sheep, and 1,849 swine. Capital, Claquato.

**LEWIS**, the name of four brothers prominent in the revolutionary history of Virginia, whose father, John Lewis, was descended from a Huguenot family which settled first in England, and afterward in Ireland. Having killed his landlord in resisting an illegal attempt to oust him from his possession, he emigrated to America, and in 1732 settled at Bellefonte, Augusta co., Va., being the first white resident of the county. **I. Andrew**, the third in age, but the most distinguished of the brothers, a revolutionary general, born in Ulster, Ireland, about 1730, died in Bedford co., Va., in 1780. He was remarkable for bodily vigor and commanding presence, and early became conspicuous in frontier struggles. He volunteered in the expedition to take possession of the Ohio region in 1754; was with Washington at the surrender of Fort Necessity; was present at Braddock's defeat; commanded the Sandy creek expedition in 1756; and was made prisoner in the unfortunate enterprise of Major Grant near Fort Du Quesne. In 1768 he was a commissioner on the part of Virginia to conclude a treaty with the Six Nations at Fort Stanwix, N. Y. In 1774 he received the appointment of brigadier general; and as commander-in-chief at the battle of Point Pleasant (the junction of the Great Kanawha with the Ohio), he gained a victory over the most formidable Indian force that ever assembled within the limits of the Old Dominion, headed by the celebrated Cornstalk. The number of troops engaged under Gen. Lewis was about 550, of whom from 40 to 75 were killed and about 140 wounded. The Indian force is believed to have been 800 or 1,000. Lewis represented

the county of Botetourt in the house of burgesses for several years, and was a member of the convention of March and June, 1775. In the same year he was appointed colonel of a regiment in the continental army, and in 1776, at Washington's request, was promoted to brigadier general. One of his first acts after receiving this commission was to drive Lord Dunmore from his retreat on Gwynn's island. His post of duty was afterward in the lower part of the state, where he contracted a fever of which he died. His military abilities were highly valued by Washington, and his statue fills one of the six pedestals around the Washington monument at Richmond. **II. Thomas**, born in county Dublin, Ireland, in 1718, died in 1790. He was a member of the Virginia house of burgesses, where he faithfully supported the rights of the colonies. He advocated the celebrated resolutions of Patrick Henry in the session of 1765, sat in the conventions of 1775 and 1776, and was a member of the state convention which ratified the federal constitution. **III. William**, born in Ireland in 1724, died in Virginia in 1811. He was engaged in the French and Indian wars under Andrew Lewis, and served with distinction during the revolution. He obtained the rank of colonel. **IV. Charles**, born in Virginia, killed at the battle of Point Pleasant, Oct. 10, 1774. He served with distinction under Andrew Lewis, was a leader in the conflicts on the W. frontier of the state, and became a colonel.

**LEWIS, Dio**, an American physician, born at Auburn, N. Y., March 3, 1823. He was educated at Harvard medical school in Boston, and practised medicine at Port Byron and at Buffalo, N. Y. He published a monthly medical magazine at Buffalo, in which he constantly deprecated the use of drugs, and advocated the introduction of physical exercise as a part of public education. In 1863 he settled in Boston, and founded an institution for training teachers in his new system of physical education, which since 1855 he had been engaged in advocating and introducing throughout the country; and in 1864 he established in Lexington, Mass., a school for young women, in which all rules of government were abandoned. In September, 1868, the buildings were burned, and a year later the school was given up. Since then he has lectured frequently, principally on hygienic topics, and is now (1874) engaged in the temperance reform. He has published "New Gymnastics" (Boston, 1862); "Weak Lungs, and how to make them Strong" (Boston, 1863); "Talks about People's Stomachs" (1870); "Our Girls" (New York, 1871); and "Chats with Young Women" (New York, 1874).

**LEWIS, Enoch**, an American mathematician, born at Radnor, Chester co., Pa., Jan. 29, 1776, died in Philadelphia, July 14, 1856. He was educated in the principles and usages of the society of Friends. He early exhibited a remarkable talent for mathematics. At the age

of 14 he was usher in a country school, and at 15 became principal. In the autumn of 1793 he removed to Philadelphia, and studied mathematics, teaching half of each day to earn his support. In 1795 he was employed as surveyor in a corps engaged in laying out towns in the western part of the state. From 1796 to 1799 he had charge of the mathematical school in the Friends' academy founded by William Penn in Philadelphia, and afterward was mathematical tutor at Westtown boarding school. In 1808 he opened a private school for mathematical students at New Garden, Chester co., where he taught for some years with success. He edited several mathematical works with notes, and about 1819 published a treatise on arithmetic, which was followed by one on algebra, and by a work on plane and spherical trigonometry. In 1827 he became editor of a monthly periodical called the "African Observer." He wrote a life of William Penn, a treatise "On Oaths," one "On Baptism," a small volume reviewing Dr. Cox's "Quakerism not Christianity," and various pamphlets. In 1847 he undertook the publication of the "Friends' Review," of which he was the editor till his death.

**LEWIS, Estelle Anna Blanche** (ROBINSON), an American authoress, born near Baltimore in April, 1824. She was educated at the female seminary of Troy, N. Y. In 1841 she was married to Mr. Sydney D. Lewis, a lawyer of Brooklyn, N. Y., since which she has resided much abroad, principally in England. Her earliest writings were published in the "Family Magazine" of Albany, and she was afterward a frequent contributor to other periodicals. In 1844 appeared her first volume of poems, "The Record of the Heart," containing some of her best minor pieces. It was followed by "The Child of the Sea and other Poems" (1848) and "Myths of the Minstrel" (1852). In 1863, while on a visit to the United States, she published "Helémah, or the Fall of Montezuma," a tragedy. In 1865 she returned to England, and a collection of her poems was reprinted in London in 1866. In 1868 she produced "Sappho of Lesbos" a tragedy, and in 1869 "The King's Stratagem," a tragedy.

**LEWIS, Francis**, an American revolutionist, born at Llandaff, Wales, in March, 1713, died in New York, Dec. 30, 1803. He was educated at Westminster school, and afterward served a clerkship in a mercantile house in London. At the age of 22 he emigrated to New York, and engaged in commercial pursuits, from which he retired in 1775. In this long interval he several times visited Russia and other parts of Europe, and during the "old French war" was an agent for supplying the British troops in North America with clothing. At the surrender of Fort Oswego he was aide to Col. Mercer, and was taken with the other prisoners to Canada, and thence to France. At the close of the war the British government gave him 5,000 acres of land for his services. At

the outbreak of the revolution he was elected to the continental congress, and in May, 1775, he took his seat in that body as one of the delegates from New York. He signed the Declaration of Independence, and with the exception of one short interval continued to be a member of congress until April, 1779. His residence on Long Island, whither at the time of his first election to congress he had removed his effects, was wantonly plundered by the British troops, and so greatly was his property reduced by the war that he died a poor man.

**LEWIS, Sir George Cornwall**, an English statesman, born in Radnorshire, Wales, Oct. 21, 1806, died April 13, 1863. His father, Sir THOMAS FRANKLAND LEWIS (1780-1855), officiated successively as joint secretary of the treasury, vice president of the board of trade, treasurer of the navy, and in other public capacities, and was created a baronet in 1846. Sir George was educated at Eton, and at Christchurch, Oxford, where he distinguished himself by classical attainments, and in 1831 was called to the bar, but never practised. After holding various appointments under the crown, he succeeded his father in 1839 as a poor-law commissioner, an office which he filled till 1847, when he entered parliament as member for Herefordshire, and became secretary to the Indian board of control. In 1848 he became under-secretary of the home department, in 1850 financial secretary of the treasury, and in 1852 retired from office on the dissolution of the Russell cabinet. In 1854 he succeeded Prof. Empson as editor of the "Edinburgh Review," but resigned that post in 1855, when he was returned to parliament from Radnor; and on the resignation of Mr. Gladstone he was appointed, in March, 1855, chancellor of the exchequer in the Palmerston ministry. He held office till February, 1858, when on the formation of the Derby ministry he retired. In June, 1859, he returned to office as home secretary in the cabinet of Lord Palmerston, and in July, 1861, was transferred to the war department, succeeding Lord Herbert. In the intervals of his political and official duties he wrote a number of elaborate historical and philosophical treatises, including "The Use and Abuse of Political Terms" (1835); "Origin and Formation of the Romance Languages" (1835; 2d ed., 1862); "Remarks on Local Disturbances in Ireland" (1836); "Essay on the Government of Dependencies" (1841); "Influence of Authority in Matters of Opinion" (1849); "Methods of Observation and Reasoning in Politics" (2 vols., 1852); "An Inquiry into the Credibility of the Early Roman History" (2 vols., 1855); "Foreign Jurisdiction and the Extradition of Criminals" (1859); "Historical Survey of the Astronomy of the Ancients" (1862); "Dialogue on the Best Form of Government" (1863); and "Essays on the Administrations of 1783 to 1830" (1864, edited by Sir E. Head). A volume of his "Letters to Various Friends" was published

in 1870. He also published translations of Böckh's "Public Economy of Athens" (1828; 2d ed., 1842), and Müller's "Account of the Doric Race" (2 vols., 1830).—He married in 1844 Lady Maria Theresa (Villiers), widow of Thomas Henry Lister, Esq., and sister to the earl of Clarendon. She wrote "The Lives of the Friends and Contemporaries of Lord Chancellor Clarendon" (3 vols., 1852), and other biographical works, and died in 1865.

**LEWIS, John Frederick**, an English painter, born in London, July 14, 1805. He early attracted attention by representations of wild animals both in water colors and oils, and between 1830 and 1850 made long and repeated visits to Spain, Italy, Greece, Turkey, and Egypt. His Spanish scenes, representing bull fights, peasants dancing, or episodes in the Carlist war, have been admired, as also the scenes from Italian life, such as "Roman Peasants at a Shrine," and "The Pope Blessing the People." In the exhibition of the water-color society for 1850 appeared his "Harem;" in 1852, "An Arab Scribe, a Scene in Cairo;" in 1854, "A Halt in the Desert" and "Bedouins and their Camels;" in 1855, "The Well in the Desert;" and in 1856, "A Frank in the Desert of Mount Sinai," "Street Scene in Cairo," &c. In 1855 he made his first appearance for many years as a painter in oils in a portrait of an Armenian lady. Among his works are a series of 60 copies in water colors of the masterpieces of the Venetian and Spanish schools, which belong to the Scottish academy. He has occasionally practised engraving both on metal and stone, and has published two volumes of sketches from Spanish subjects. In 1855 he was elected president of the society of painters in water colors. He resigned in 1858; and in 1859 he was elected associate, and in 1865 member of the royal academy.

**LEWIS, Matthew Gregory**, an English author, born in London, July 9, 1775, died at sea, while returning from Jamaica, May 14, 1818. He was educated at Christchurch, Oxford, and lived for some time in Germany, where he became imbued with the mysterious and tragic spirit which characterizes his writings. When but 16 years old he wrote "The East Indian, a Comedy." In 1795 appeared his romance "The Monk," the outline of which is taken from a story of the Santon Barsisa in the "Guardian." This at once became popular, and though he had obtained a seat in parliament, the society for the suppression of vice took steps to prosecute the author; but Lewis pledged himself to recall the printed copies and suppress the objectionable passages in future editions. In 1796 appeared "Village Virtues, a Drama," and in 1797 his "Castle Spectre" was acted for 60 nights. In 1798 he visited Edinburgh, and made the acquaintance of Sir Walter Scott, who contributed several ballads to the "Tales of Wonder" published by Lewis in 1801. On the death of his father he became possessed of considerable wealth,



and plantations in Jamaica, which he twice visited. Besides the works above named, he wrote a number of plays, among them "Timour the Tartar" (1812), which had great influence in creating the taste for gorgeous pageants, and many poems, of which "Alonzo the Brave," "Durandarte," and "The Fair Imogene" are the best known. In 1834 appeared his "Journal of a West Indian Proprietor," and in 1839 his "Life and Correspondence" (2 vols. 8vo).

**LEWIS, Meriwether**, an American explorer, born near Charlottesville, Va., Aug. 18, 1774, died near Nashville, Tenn., Oct. 11, 1809. He inherited a moderate fortune from his father, who died when he was a child. In 1794 he enrolled himself as a volunteer in the troops called out to quell the "whiskey insurrection" in western Pennsylvania, entered the regular service in 1795, became a captain in 1800, and between 1801 and 1803 was private secretary to President Jefferson. In the latter year he was recommended to congress by Jefferson to command the exploring expedition across the continent to the Pacific. In company with Capt. William Clarke, his associate in the conduct of the expedition, he set out in the summer of 1803, and encamped for the winter on the bank of the Mississippi, opposite the mouth of the Missouri. Their company was composed of nine young men from Kentucky, 14 soldiers, two Canadian boatmen, an interpreter, a hunter, and a negro servant of Capt. Clarke. In the spring of 1804 they began to ascend the Missouri. A second winter was passed among the Mandans, lat. 47° 21' N. On April 7, 1805, they again moved forward, still ascending the Missouri, and reached the great falls by the middle of June. Above these, near the close of July, they attained the point where three nearly equal streams concur; to these were given the names of Jefferson, Madison, and Gallatin, then president, secretary of state, and secretary of the treasury of the United States. They ascended the Jefferson, the northernmost of the three, to its source. Having in August procured horses and a guide from the Shoshone Indians, they travelled through the mountains until Sept. 22, when they entered the plains of the western slope. On Oct. 7 they embarked in canoes on the Kookskooky, a left branch of the Columbia, and on Nov. 15 reached the mouth of that river, having travelled more than 4,000 m. from the confluence of the Mississippi and Missouri. They passed their third winter in an entrenched camp on the S. bank of the Columbia. On March 23, 1806, they began to reascend the Columbia on their homeward journey; and leaving their boats on May 2, they made a difficult journey on horseback across the mountains to the Missouri, upon which they reëmbarked Aug. 12, and reached St. Louis Sept. 23, after an absence of two years and four months. Congress made grants of land to the men of the expedition and to their chiefs; Lewis was made governor of Missouri

territory, and Clarke general of its militia and Indian agent. In the comparative quiet of his new mode of life Lewis began to suffer from hypochondria, to which he had been subject from his youth. During one of these seasons of depression duty called him to Washington, and at a lodging place in Tennessee he put an end to his life. A narrative of the expedition of Lewis and Clarke, from materials furnished by each of the explorers, was prepared by Nicholas Biddle and Paul Allen, with a memoir of Lewis by Jefferson (2 vols., Philadelphia, 1814; new ed., with additions by Archibald McVickar, 2 vols., New York, 1843).

**LEWIS, Morgan**, an American soldier, son of Francis Lewis, signer of the Declaration of Independence, born in New York, Oct. 16, 1754, died there, April 7, 1844. He graduated at Princeton college in 1773, and studied law in the office of John Jay. At the breaking out of the revolution he obtained a commission in the American service, and until the close of the war was actively employed, distinguishing himself at Saratoga, and in the operations undertaken by Gen. Clinton against Sir John Johnson in northern New York. He retired from the service with the rank of colonel, resumed the study of the law, became attorney general of the state of New York in 1791, judge of the supreme court in 1792, and in 1801 was appointed chief justice of the supreme court of New York, an office which he resigned in 1804 upon being elected governor of the state. In 1807 he resumed his practice, and upon the breaking out of the war with England in 1812 he was appointed quartermaster general in the United States army. In 1813 he was promoted to major general, and on April 27 of that year made a successful descent on the British side of the Niagara river. In 1814 he commanded the forces concentrated in New York for the defence of that city, then in daily expectation of attack. In 1835 he became president of the New York historical society.

**LEWIS, Tayler**, an American scholar, born in Northumberland, Saratoga co., N. Y., in 1802. He graduated at Union college in 1820, studied law in Albany, and began to practise at Fort Miller. Occupying his leisure in the study of the Hebrew Bible, he was led to give to Biblical and classical studies a large part of his time for nearly ten years. At length he abandoned the practice of law altogether, and in 1833 opened a classical school in Waterford, whence he removed in 1835 to a school in Ogdensburgh. In 1838 he became professor of Greek in the university of New York, in which post he continued 11 years. He acquired an unusually wide acquaintance with the Greek and Latin classics, and a knowledge of the Arabic and Syriac, and read the Koran and other Arabic writings and the writings of the Hebrew rabbis. His special interest in the system of Plato led him to publish a translation of the "Theætetus," with notes; and in 1845 he published

the Greek text of the tenth book of Plato's dialogue, "The Laws," under the title "Platonic Theology, or Plato against the Atheists," with critical and explanatory notes, and illustrative dissertations, showing profound learning. In 1849 he was chosen professor of Greek in Union college, where he still remains (1874), and where he has lectured on ancient philosophy and poetry, and given instruction in the oriental tongues. In 1855 he published "The Six Days of Creation," his best known work, maintaining on philological grounds the harmony of the Scriptures and geology. In reply to criticisms upon this work he published "The Bible and Science" (1856). "The Divine Human in the Scriptures" (1860) applies the same ideas to the whole Bible, maintaining that the language is phenomenal that it may be intelligible, while the thought is divine. Dr. Lewis wrote many of the articles in "Harper's Magazine" under the title of "The Editor's Table" for nearly five years (1851-'6), and has contributed largely to other periodicals, discussing topics of theology, philology, and present social and political interest. He has also published "State Rights, a Photograph from the Ruins of Ancient Greece" (1864), and "Heroic Periods in a Nation's History" (1866); with G. B. Cheever, "Defence of Capital Punishment" (1845); and with E. W. Blyden and Theodore Dwight, "The People of Africa, their Character, Condition, and Future Prospects" (1871). He has translated Lange's commentary on Ecclesiastes, and, with Dr. Gosman, that on Genesis. He received the degree of LL. D. from Union college in 1844.

**LEWIS AND CLARKE**, a W. central county of Montana, bounded E. by the Missouri river, and bordering on the Rocky mountains on the west; area, 1,700 sq. m.; pop. in 1870, 5,040, of whom 666 were Chinese. In the south are productive gold mines. The N. portion, including the fertile valley of the Missouri, is well adapted to agriculture and grazing. In 1870 there were 57 placer and 4 quartz gold mines. The chief productions were 18,658 bushels of wheat, 11,448 of oats, 12,223 of barley, 23,210 of potatoes, 107,990 lbs. of butter, and 4,106 tons of hay. There were 493 horses, 1,210 milch cows, and 2,063 other cattle; 3 manufactories of boots and shoes, 1 of carriages, 1 of iron castings, 3 of jewelry, 1 of sash, doors, and blinds, 4 of tin, copper, and sheet-iron ware, 4 breweries, 3 saw mills, and 6 quartz mills. Capital, Helena.

**LEWISIA**, an interesting plant of the *portulaca* family, named in honor of Capt. Meriwether Lewis, who collected it while on his early exploring expedition with Clarke. The large, thick, branching root throws up a cluster of narrowly linear, succulent leaves, from among which arise several short stems, each of which bears a single showy rose-colored flower, over an inch across; the six to eight sepals are petal-like, and with the rather more numerous petals give the flower the appear-

ance of being double. Its season of growth lasts but a few weeks, the leaves entirely disappearing soon after the flowers fade. The roots are remarkably tenacious of life; the specimens brought home by Lewis, though they had been in drying papers for several months, showed some signs of life, and when planted grew readily; on this account Pursh gave it the specific name of *rediviva*. It is found from the mountains of northern Arizona to those of Oregon, and is one of the many plants used as food by the Indians, who call it *spatum*. The root has a dark-colored bark, but when this is removed the interior is white and starchy, and though bitter, even when cooked, it is very nutritious; on account of its bitterness the Canadian voyageurs call it *racine amère*. One other species, *L. brachy-calyx*, is found in Utah and southward.

**LEWISBURG**, a borough and the capital of Union co., Pennsylvania, on the W. branch of Susquehanna river, here crossed by a bridge, at the mouth of Buffalo creek, 49 m. N. of Harrisburg; pop. in 1870, 3,121. It is situated on a branch of the Philadelphia and Erie railroad, 2 m. from the main line, and has considerable trade in grain and other produce. It contains two iron founderies, two national banks, two weekly newspapers, and eight churches. The borough is the seat of Lewisburg university and University female institute, established in 1847 by the Baptists. The former in 1874 had 7 professors, 150 students (73 of collegiate grade), and a library of 5,000 volumes; the latter, 9 instructors, 116 students, and a library of 1,000 volumes.

**LEWIS RIVER**. See SNAKE RIVER.

**LEWISTON**, a city of Androscoggin co., Maine, on the E. bank of the Androscoggin river, opposite Auburn, with which it is connected by four bridges, and on the Lewiston and Androscoggin divisions of the Maine Central railroad, and the Lewiston and Auburn branch of the Grand Trunk line, 36 m. N. of Portland, and the same distance S. W. of Augusta; pop. in 1850, 3,584; in 1860, 7,424; in 1870, 13,600, of whom 3,008 were foreigners; in 1874, about 20,000. Its importance is chiefly due to its water privileges, which are among the best in New England, now applied to a great variety of machinery, involving large manufacturing interests. The river breaks over a diagonal ledge



*Lewisia rediviva*.

of rocks, and falls more than 50 ft. in a distance of 200 ft. The natural advantages thus furnished are increased by stone dams extending across the river, and by a canal 60 ft. wide reaching from above the falls to the mills. The conformation of the ground is such that the water may be used several times. The Franklin company, incorporated in 1854, with a capital of \$1,000,000, owns the water power, canals, and other real estate, and rents to other companies. It also owns the Lincoln mill, which produces fine cottons and jeans. Including the Franklin company, there are nine corporations engaged in the manufacture of cotton and woollen goods, with an aggregate capital of \$7,750,000, employing 20 sets of woollen machinery and about 270,000 spindles. The principal kinds of goods made are sheetings, shirtings, cassimeres, repellants, gingham, cottonades, quilts, beavers, ladies' cloakings, tweeds, tickings, duck, twine, and jute bags. The number of hands employed in the

mills is about 8,300 (3,800 males and 4,500 females), and the annual product is 37,000,000 yards of cloths and 3,000,000 bags. The Lewiston bleaching and dye works have a capital of \$300,000, and employ 280 hands. The Lewiston machine company produces cotton and woollen machinery. The other principal manufactures are of boots and shoes, bricks, carriages, sash, doors, and blinds, furniture, and lumber. The total annual value of the manufactures is about \$11,500,000. There are a national bank with \$400,000 capital and two savings banks. The city is divided into seven wards, and is governed by a mayor, a board of aldermen, and a common council. It is lighted with gas, and has a handsome city hall. Lewiston is the seat of Bates college, under the control of the Free Baptists, which was established in 1863 and named in honor of Benjamin E. Bates of Boston, who contributed \$200,000 to its endowment. It has handsome grounds, three fine college buildings, and a



Bates College, Lewiston, Me.

president's residence. A theological department, occupying a four-story brick building about  $\frac{1}{4}$  m. from the grounds, was organized in 1870. In 1873-'4 this institution had 10 professors (4 in the theological department) and 2 tutors, 122 students (19 theological), and 8,800 volumes in its libraries, viz.: college library, 4,500; theological, 2,200; societies', 1,600. The Nichols Latin school, named in honor of Lyman Nichols of Boston, near the grounds, is owned by the college and maintained as a preparatory school; in 1871-'2 it had four instructors and 68 students. The city has excellent graded schools, including high and normal departments, attended by about 2,000 pupils. There is a public library of 6,000 volumes, established by the corporations. A daily and two weekly newspapers and a monthly periodical (by the college students) are published. There are 11 churches, viz.: Baptist, Congregational, Episcopal, Free Baptist (3), Methodist (2), Roman Catholic

(2), and Universalist.—Lewiston was settled in 1770, and incorporated as a town in 1795. In 1861 a city charter was granted, but the city government was not organized till 1863.

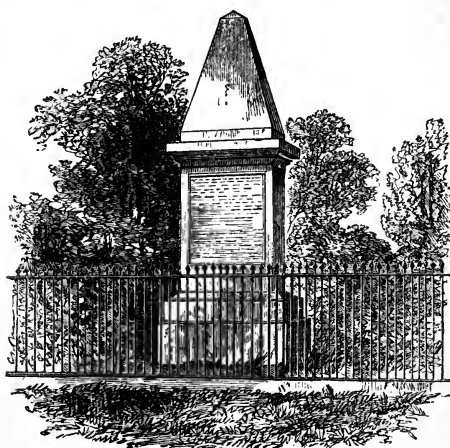
**LEWISTON**, a town and village of Niagara co., New York, on the Niagara river, 7 m. from its entrance into Lake Ontario, and the same distance below the falls, and on a branch of the New York Central railroad; pop. of the town in 1870, 2,959; of the village, 770. A suspension bridge, with a span of 600 ft., built across the river at this point in 1850, was partially destroyed by an ice jam in 1864. It is to be repaired and used as a railroad bridge, to connect the Lake Ontario Shore railroad with the Great Western railway of Canada. Lewiston is the seat of the Roman Catholic theological seminary of Our Lady of Angels, organized in 1856 and chartered in 1863. In 1814 the town was burned by the British.

**LEXINGTON**, a central county of South Carolina, bounded N. E. by the Congaree and S.

W. by the Edisto river, and intersected by the Saluda and N. Edisto; area, 980 sq. m.; pop. in 1870, 12,988, of whom 4,536 were colored. The surface is diversified. The chief productions in 1870 were 46,383 bushels of wheat, 180,729 of Indian corn, 13,584 of oats, 33,647 of sweet potatoes, 2,534 bales of cotton, and 32,275 lbs. of rice. There were 1,568 horses, 954 mules and asses, 3,204 milch cows, 6,521 other cattle, 4,449 sheep, and 16,962 swine; 1 cotton factory, 11 flour mills, and 7 saw mills. Capital, Lexington Court House.

**LEXINGTON**, a town of Middlesex co., Massachusetts, at the terminus of a branch of the Boston, Lowell, and Nashua railroad, 10 m. N. W. of Boston, and 7 m. E. of Concord; pop. in 1870, 2,277. The surface is diversified, and the soil generally fertile. A large quantity of milk is produced, the greater part of which is sent to Boston. There are ten public schools, including a high school, four churches, and a weekly newspaper.—Lexington is memorable as the scene of the first armed encounter between the British and Americans in the revolutionary contest. On the night of April 18, 1775, Paul Revere of Boston, eluding the British sentinels, escaped into the country across Charles river, and spread information of the intended march of a detachment of British troops 800 strong, commanded by Lieut. Col. Smith, to seize the provincial stores and cannon at Concord. About midnight he reached the house of the Rev. Jonas Clark, the minister of Lexington, where Hancock and Adams lodged. The town at that time contained about 700 inhabitants, and nearly all the able-bodied males had been trained to the use of arms, and were enrolled as minutemen. The alarm was given, and by 2 o'clock in the morning about 130 militiamen were assembled under arms on the common, commanded by Capt. John Parker, who ordered them to load with powder and ball, but not to be the first to fire. Messengers were then sent toward Boston to look for the British, who returned reporting that there were no signs of their approach. A watch was set, and the militia dismissed with orders to assemble again at beat of drum. Just at daybreak the advanced guard of the enemy, commanded by Major Pitcairn, was discovered approaching the village. The alarm was given, and between 60 and 70 of the militia assembled and were paraded in two ranks on the common a few rods north of the meeting house. The British halted to load, and to allow the rest of the detachment to come up. They then advanced almost on a run. Pitcairn rode in front, and when within five or six rods of the Americans ordered them to lay down their arms and disperse. They kept their ranks until he discharged his pistol against them, and ordered his men to fire. A discharge of musketry followed, by which four were killed on the spot and nine wounded; four others were killed while attempting to escape. When the British fired, Capt. Parker ordered his men

to disperse; a few of them returned the fire, wounding three British soldiers and the horse of Pitcairn. The British drew up on the common, fired a volley, gave three cheers, and after a halt of half an hour marched on to Concord. On their retreat from that place, after the battle at the bridge (see CONCORD), while passing through Lincoln, they were attacked by the Lexington men, and as they were ascending Fiske's hill in the west part of Lexington a sharp contest took place in which a number were killed. About a mile below the common the British were saved from total destruction by the arrival of a reinforcement of 1,200 men under Lord Percy. The action at Lexington roused the whole country. The night before it there were few people in the colonies that expected any blood would be shed in the contest. The night after the royal governor and army found themselves closely beleaguered in



Monument at Lexington.

Boston. In 1799 a small monument was erected on Lexington common to mark the spot of the first bloodshed of the revolutionary war.

**LEXINGTON**, a town and the capital of Rockbridge co., Virginia, on North river, an affluent of the James, 110 m. W. by N. of Richmond; pop. in 1870, 2,873, of whom 891 were colored. It is situated in a valley and surrounded by beautiful mountain scenery, and is the seat of Washington and Lee university, which in 1872-'3 had 22 officers and instructors, 263 students, and a library of 10,000 volumes. (See WASHINGTON AND LEE UNIVERSITY.) The Virginia military institute, situated here, was organized in 1839 as a state military and scientific school, and the system of instruction and government is similar to that of the United States military academy at West Point. The state makes an annual appropriation of \$15,000 for its support, and appoints a number of cadets, who receive their tuition free. In 1872 the institute had 12 professors, 300 students, and a library of 5,000 volumes.

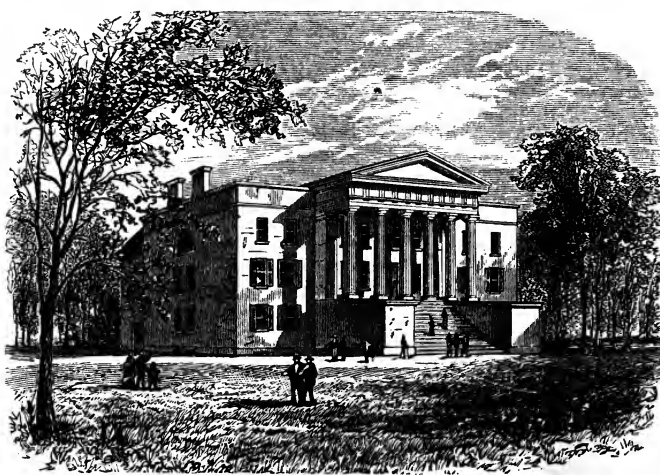
**LEXINGTON**, a city and the capital of Fayette co., Kentucky, situated on the Town fork of Elkhorn river, a tributary of the Kentucky, at the intersection of the Louisville, Cincinnati, and Lexington, and the Kentucky Central railroads, 65 m. E. by S. of Louisville, and 20 m. S. E. of Frankfort; pop. in 1860, 9,321; in 1870, 14,801, of whom 7,171 were colored. The surrounding country is of unsurpassed beauty and fertility. The streets are wide, laid out at right angles, and are well paved, lighted with gas, and bordered with trees. Main street is more than 2 m. long; at its W. end is a beautiful cemetery, containing a monument to Henry Clay. Lexington has an important trade, and contains carriage factories and extensive bagging and rope factories. There are three national banks, with an aggregate capital of \$900,000, and a state bank, with \$550,000. It contains one of the state insane asylums and an orphan asylum, and is the seat

Patterson. The news of the battle of Lexington reached the settlers while they were laying out the town, and they immediately named it after the first battle field of the revolution. The town was incorporated by an act of the Virginia legislature in 1782. The first legislature of Kentucky met here.

**LEXINGTON**, a town and the capital of Lafayette co., Missouri, on the right bank of the Missouri river, 110 m. N. W. of Jefferson City; pop. in 1870, 4,373, of whom 1,178 were colored. It occupies a healthy site 300 ft. above the river. It is the terminus of a branch of the Missouri Pacific railroad, and North Lexington, on the opposite bank of the river, is a station on the St. Louis, Kansas City, and Northern railroad, and the terminus of the St. Joseph branch of that line. The surrounding country is fertile, and contains deposits of coal. Lexington has an important trade, and contains saw mills, flouring mills, rope factories,

four banks, three public schools, three female seminaries, four weekly (one German) newspapers, and eleven churches. It was settled in 1837. In September, 1861, there was severe fighting between the federals stationed here, nearly 3,000, under Col. Mulligan, and a confederate force four times as large under Gen. Price, resulting in the surrender of the town and garrison on the 21st.

**LEX LOCI** (Lat., the law of the place), in jurisprudence, a general rule that remedy for all legal wrongs must be pursued in accordance with the forms prescribed by the *lex fori*, the law of the



College of Arts, Kentucky University.

of the state university, which in 1871-'2 had 21 professors, 9 other officers and instructors, 579 students in all departments, and 20,000 volumes in its libraries. This institution was chartered in 1858, and opened at Harrodsburg in 1859. In 1865 it was removed to Lexington, and Transylvania university was merged in it. (See KENTUCKY.) Lexington contains five female educational institutions, viz.: Hocker female college (Disciples), the Sayre institute, a Baptist female school, an Episcopal female school, and St. Catharine's academy (Roman Catholic), each having handsome and commodious buildings. There are three free schools for white children, with an average attendance of 650 pupils; four for colored children, average 455; and two Catholic schools, average 180. The Lexington library company has 16,000 volumes. There are two semi-weekly and two weekly newspapers and 18 churches.—The first settlement was made in 1775 by Col. Robert

forum, or law of the country to whose courts appeal is made for redress, and that the character, nature, and extent of the remedy which will be afforded must be determined and measured by that law. Thus, if a subject of a foreign country whose laws give attachment of goods and summary judgment for the enforcement of debts, and admit of no exemptions from the execution that may issue on the judgment, shall bring suit for the recovery of a debt in the courts of another country, where jury trial is allowed, where the processes are slow and deliberate, and where large exemptions from execution are made, he must submit to the delays and exemptions which the laws to which he appeals shall permit or provide for; and no rule of interstate comity will entitle him to have the summary proceedings of his own country introduced in another for his benefit. But while the *lex fori* determines the remedy, there are several classes of cases in



which the law of another jurisdiction may be resorted to as the measure and rule of the rights and obligations of the parties, by reason of the subject of the controversy being there situate, or because the contract from which the controversy has arisen was there made, or for some other reason hereafter indicated. Thus, it is a settled doctrine of what may be called private international law, that the title to real estate can only be conveyed or transmitted in accordance with the *lex rei sitæ*, the law of the state or country in which it is situated. Therefore all deeds, wills, or other conveyances, to be effectual, must be executed with such capacity and under such forms as are made necessary by that law; and in case of intestacy, the course of descent will be determined by that law, irrespective of the domicile of the owner at his death. And in whatsoever country a legal controversy brings in question the title to lands, the *lex fori* will take notice of and act upon the *lex rei sitæ* in determining this question; while, on the other hand, the tribunals of no country will recognize any act or instrument done or executed abroad as sufficient to pass the title to land within it, unless its own laws provide that such act or instrument shall be effectual for the purpose. The rule is different, however, as regards contracts for the payment of money, for the sale or bailment of personal property, or for the performance of any personal acts. All such contracts must be made with the capacity and under the formalities required by the law of the place where made; they must be construed by that law, and their validity and effect determined by it. If sufficient and legal there, they will in general be held sufficient and valid everywhere, and the party injured by a failure in performance will be afforded in any country in which he may find the other party, and bring suit against him, such remedy as the laws of that country in their regular course will give in similar cases upon contracts there made, even though the particular contract if made in that country would, for any reason, have been wanting in validity. Thus, if a citizen of New York should go abroad and take up his abode either temporarily or permanently in Paris, leaving unperformed contracts behind him, the promises in these contracts might follow him to Paris, and there bring suit for their enforcement or for the recovery of damages; and while the French court would only give a remedy under its own forms, yet in determining whether the contract was enforceable at all, it would test the validity by the New York law and not by that of France. And, on the other hand, if an American should make purchases in France and fail to pay for them, if the contracts of purchase were valid in France, the courts of America would give the proper remedy for the recovery of the purchase price here. There are doubtless some exceptions to this rule which rest upon reasons easily understood and appreciated. Thus, if a

contract should be made in France for something to be done in our own country in evasion of its revenue laws, it would hardly be reasonable to expect that our courts would lend their aid in enforcing such a contract, even though valid in France, or that they would punish in damages the party who refused to perform it. The general rule may be said to be that no country will give the assistance of its courts to enforce any contract which its own laws forbid, or which contravenes its public policy, or which is immoral in its tendency or purpose. Sometimes a contract is made in one country to be performed in another, as where a draft is drawn in New York, payable in London; and in such cases the law of the place of performance is supposed to be had in view by the parties in making it, and must measure their rights and obligations where nothing in the contract indicates a different intent. Anything done by a party which satisfies or discharges a contract by the law of the place, will be an effectual discharge everywhere; but statutes of limitation pertain to the remedy only, and it will often happen that a party may be permitted a remedy in one jurisdiction which would be denied him in another because of the lapse of time. Thus, suppose a debt contracted in New York to fall due in 1860, and three years later the debtor removes thence to Ohio, where he resides for six years. If now he is sued upon the debt in Ohio, he may effectually plead its statute of limitations, which bars the action after six years' opportunity to pursue the remedy in that state; but should he return to New York, he might be sued, and have judgment against him there at any time within three years of his return, because the period of his absence from the state would be excluded in computing the time of bar under the New York statute.—The validity of a marriage is to be determined everywhere by inquiring whether it was valid by the law where it was made. This rule has led to systematic evasions of the laws where they required formalities which were inconvenient, or which in particular cases could not be complied with; the parties passing into another jurisdiction where such formalities were not required, and returning married according to the foreign law. From this rule must be excepted incestuous and polygamous marriages, which will not be recognized in Christian countries. And there may possibly be some cases where marriages entered into in defiance of the local law would be recognized elsewhere, if the ground of the prohibition were utterly unreasonable; as for instance, if the local law should absolutely inhibit persons of a particular religion from marrying at all.—From what has above been stated it would be apparent that ante-nuptial contracts and marriage settlements may determine the property rights of parties wherever they go; for though the parties in passing from one country to another cannot take the laws with them, they do take their

contract with them, and the meaning of this contract is the same everywhere that it was when made, and does not change with their change of domicile. As to the law governing divorce, see that title.—Personal property on the decease of its owner is to be disposed of according to the law of his domicile, whether the legal proceedings for the purpose take place there or elsewhere. This is so whether he dies testate or intestate. If there is personal property in two jurisdictions, so that two administrations become necessary, that of the domicile is regarded as the principal, and the other as ancillary.—The leading authority on these subjects in Europe as well as America is Story's "Treatise on the Conflict of Laws."

**LEYDEN**, or **Leiden** (Dutch *Leijden*; anc. *Lugdunum Batavorum*), a city of the Netherlands, in the province of South Holland, 22 m. S. W. of Amsterdam and 9 m. N. E. of the Hague, on the Old Rhine, which discharges its narrow stream into the sea at a distance of 6

architecture. The large open space called the *Ruïne* in the Rapenburg street, now planted with trees, was covered with dwellings until 1807, when 800 of them were destroyed with 150 persons by an explosion of gunpowder on a barge passing through the canal. In the centre of the town is a ruined tower on a mound, said to have been built by Drusus, but attributed by some to Hengist the Saxon. It is now an inn, and the grounds around it form a tea garden. The chief ornament of Leyden is the university, which for some time contributed so much to the learning of Europe that Leyden was called the Athens of the West. Associated with it are, among many others, the names of Joseph Scaliger, Arminius, Gomarus, Grotius, Descartes, Heinsius, and Boerhaave. Evelyn, Fielding, Goldsmith, and other English men of letters studied at Leyden. The university is still attended by about 700 students, and there are 40 professors. The museum of natural history, one of the

most extensive in Europe, is especially rich in productions of the East and West Indies, and has a remarkable collection of birds. The cabinet of comparative anatomy is exceedingly rich. The collections of shells, of minerals and insects, and of agricultural objects, as well as the Egyptian museum, possess great interest, as does the Japanese collection of Siebold (the most comprehensive of the kind in the world), which since 1864 has formed a part of the national ethnographic museum. The library contains 90,000 printed volumes and 14,000 manuscripts, including some of the rarest oriental ones, collected by Golius in the 17th century. The society of Netherlandish literature, founded in 1766, had in 1873 454 members in the Netherlands and 204 in foreign countries. Printing was extensively carried on in Leyden in the 17th and 18th centuries, as was the manufacture of fine woollen cloth. In the 17th century the population was estimated as high as 100,000. Nearly 4,000 of the inhabitants were carried off by the plague in 1655. In more recent times industry has declined, but Leyden continues to be the principal market for wool and woollen goods in the Netherlands. There are 16 steam factories, three of which are of cloth, besides baize and camlet factories, wool-spinneries, and calico print works. There are also tanneries, soap works, breweries, distilleries, a manufactory of paper hangings, machine works, and five



Town Hall, Leyden.

m. from the city; pop. in 1872, 39,574. The city presents an antique, venerable, scrupulously clean, but dull and inanimate appearance. It was formerly fortified, but the ramparts are now levelled and planted with trees. It is surrounded by numerous windmills, in one of which Rembrandt is said to have been born, and by pleasant country seats, pleasure gardens, and meadows. It is traversed by many canals, which are crossed by about 150 bridges. The *Brede straat*, or Broad street, ranks among the finest of Europe. In it stands the town hall (*stadhuis*), a picturesque building with a tall spire and ornamented gables, erected in 1574. Other noteworthy public structures are the prison, weigh-house, cloth hall, infantry barracks, and town dockyards. There are 14 churches and a synagogue, but none of them are of remarkable

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printing offices. Large quantities of grain, butter, and cheese are sold at the weekly markets. The population has nearly doubled since the beginning of the 19th century.—The siege of Leyden and its heroic defence against the Spaniards, in the Dutch war of independence, forms one of the most interesting episodes in the history of the Dutch republic. To relieve the place, the prince of Orange cut the dikes, and a favorable wind brought in the waters so rapidly that more than 1,000 of the besiegers were drowned. The same wind wafted in the fleet of Boisot, which entered on the morning of Oct. 3, 1574, and brought relief to the inhabitants, who were on the verge of starvation. The university was founded in the following year by the prince of Orange in commemoration of this event. Leyden is associated with American history through the pilgrim fathers, who, after their arrival at Amsterdam from England in 1608, removed to Leyden in 1609, where they remained until their departure for the new world in 1620.

**LEYDEN, John**, a Scottish author, born at Denholm, Roxburghshire, Sept. 8, 1775, died in Batavia, Aug. 28, 1811. He studied at the university of Edinburgh, and was ordained in 1798; but not attaining any success in the clerical profession, he abandoned it, and applied himself to the study of medicine. In 1802 he was appointed assistant surgeon in the East India company's service, and on arriving at Madras turned his attention to the oriental languages. In 1806 he removed to Calcutta, where he was appointed professor of Hindostanee in Fort William college, and shortly afterward judge of the Twenty-Four Pergunnahs. In 1809 he was made a commissioner of the court of requests, and in 1810 assay master of the mint. Having accompanied Lord Minto in an expedition against the Dutch colony of Java in 1811, he there contracted a fever which proved fatal. The most important of his works are a "Historical Account of Discoveries and Travels in Africa" (enlarged and completed by Hugh Murray, 2 vols., Edinburgh, 1817), and "An Essay on the Languages and Literature of the Indo-Chinese Nations," published in vol. x. of the "Asiatic Researches." His poetical remains were published in London in 1819 by the Rev. John Morton, and a new edition of his "Poems and Ballads," with a memoir by Sir Water Scott (first published in the "Edinburgh Annual Register" for 1811), in 1858.

**LEYDEN, Lucas van**, otherwise called **LUCAS DAMMESZ**, a Dutch painter, born in Leyden in 1494, died in 1533. At 10 years of age he was placed with Cornelis Engelbrechtsen, a painter of Leyden, and two years later he produced a picture of St. Hubert. At 14 he engraved the celebrated print of "Mohammed killing Sergius." He subsequently rose to eminence in Holland, was an intimate friend and correspondent of Albrecht Dürer, and finished a large number of pictures. He painted in oil, in distemper, and on glass, and essayed history,

landscape, and portraits, but inclined rather to scenes of common life. His most important work is the "Last Judgment" in the town hall at Leyden, a picture of very large size. He was equally celebrated as an engraver, working on wood as well as copper.

**LEYDEN JAR.** See **ELECTRICITY**, vol. vi., p. 509.

**LEYS, Jean Auguste Henri**, a Belgian painter, born in Antwerp, Feb. 18, 1815, died there, Aug. 26, 1869. When 15 years old he entered the studio of his brother-in-law Ferdinand de Braekeleer. In 1833 his "Combat of a Grenadier and a Cossack" was exhibited in Antwerp, and attracted much attention. After travelling in France and Holland he returned to Antwerp, whence his fame spread over Europe. Among his most celebrated paintings previous to 1855 are "The Spanish Fury in 1576," "The White Hoods," "Interior of a Painter's Studio," "A Wedding in the 17th Century," "Faust and Wagner," "Albert Dürer at Antwerp," and "Faust and Margaret." His paintings, excellent in other respects, were especially remarkable for the splendor of their coloring. In 1845 he was made a member of the royal Belgian academy, and in 1849 of the board of directors of the academy of fine arts in Antwerp. To the Paris exhibition of 1855 he sent "The New Year in Flanders" and other pictures, for which one of the great gold medals was awarded him. On his return from Paris his fellow citizens received him with public demonstrations, and presented him with a magnificent golden crown. From this time he devoted himself entirely to historical painting, his subjects being principally scenes from mediæval, and especially from Flemish history. His "Mary of Burgundy giving Alms to the Poor" was sold by auction in London in 1861 for 1,000 guineas. In 1865 he was made a baron. At the time of his death he had nearly finished the frescoes in the great hall of the town house of Antwerp, representing scenes from Flemish history, and which may perhaps be regarded as the highest effort of his genius.

**LHA-SSA.** See **LASSA**.

**L'HÔPITAL, Michel de**, a French statesman, born at Aigueperse, Auvergne, about 1505, died near Étampes in March, 1573. He was made president of the court of accounts in 1554, and chancellor of France in 1560. In the former office he proved his integrity and courage by refusing the 20,000 livres which Henry II. demanded for Diana of Poitiers; in the latter he refused to sign a sentence of death against the prince of Condé. His aim was to moderate all parties, and he opposed violence in politics and intolerance in religion. To him were due the edict of Romorantin (1560), which prevented the establishment of the inquisition in France; the ordinance of Orleans (1561), at once an administrative, judicial, and religious code; the edict of pacification (1562), which authorized the free exercise of Protestant worship, with certain precautions

for the preservation of peace; the edict of Roussillon (1564), which fixed the beginning of the year at Jan. 1; and the ordinance of Moulins (1566), to reform the administration of justice. He gave up the seals of office in 1568, and retired to the country. His moderation had drawn upon him the enmity and suspicion of the Catholic party, especially as his wife and family had all become Protestants. A troop sent to protect him at the period of the St. Bartholomew massacre being mistaken for assassins, he commanded the door to be opened to them, saying that his time would come whenever God pleased. His complete works, embracing Latin poems, harangues, memoirs addressed to the king and the parliament, and a political testament, were edited by Dufey (4 vols., Paris, 1824). A new edition of his poems was published in Paris in 1857.

**LIAS**, an English provincial name for a group of strata lying at the base of the Jurassic formation, and more or less intermingled with the overlying oölite; but in the Jura the two formations are distinct, the oölite reposing unconformably upon the lias. Over a considerable portion of Europe it is found in alternating beds of clay, sandstones, and limestones, which altogether attain a thickness of 500 to 1,000 ft. The limestones have a peculiar appearance, lying in thin strata of a bluish or grayish color within, and light brown without where exposed to the weather. (See *GEOLOGY*, vol. vii., p. 697.) The formation is especially interesting in Europe for the variety of fossils it affords, the most extraordinary among which are the huge reptiles, the ichthyosaurus and plesiosaurus of several species. The limestones abound also in corallines, and in a great variety of shells. The fish are all of extinct genera.

**LIBANIUS**, a Greek sophist and rhetorician, born in Antioch in A. D. 314, died there toward the close of the same century. He taught rhetoric at Constantinople, where his school drew such vast numbers of students that his rivals caused him to be expelled from the city as a sorcerer. He went to Nicomedia, where he taught for five years, but returned finally to Antioch. He was highly esteemed by the emperors Julian, Valens, and Theodosius. He was a pagan, but maintained friendly relations with many Christians, including St. Basil and St. Chrysostom, who were his pupils. He was a voluminous author, and many of his orations and other compositions are extant, but there is no complete edition of them.

**LIBANUS**, Mount. See **LEBANON**.

**LIBAU**, a seaport of Russia, in the government of Courland, on the Baltic and on the river Libau, 121 m. W. S. W. of Riga; pop. in 1867, 9,090. It has four churches, a synagogue, a theatre, a hospital, an orphan home, two poorhouses, and a lighthouse. The increasing shallowness of the port has of late considerably reduced its commerce, but it still remains the most important commercial town of Courland.

**LIBEL**, in law, has one meaning in criminal law, or as a ground for civil action, and quite another as one of the processes of legal remedy. In both senses the word is derived from the Latin *libellus*, which means literally a little book, but was used for any brief writing. In the Roman criminal law the phrase was *libellus famosus*. In our law a libel may be defined as any published defamation. In *The People v. Crowell*, 3 Johnson's Cases, 354, occurs the following definition of a libel, which has been often commended: "A censorious or ridiculous writing, picture, or sign, made with a mischievous and malicious intent toward government, magistrates, or individuals." We propose to consider: 1, what this defamation must be; 2, what the publication; 3, what the punishment or remedies; 4, what may be the defence. Before proceeding to these topics, it may be well to remark, however, that libel is distinguished in law from slander, by the fact of publication; for while libel is published defamation, slander is only spoken defamation. (See **SLANDER**.) As to the requisite defamation, it need not charge any crime, nor anything which must affect a man's business or pecuniary interest, or indeed accuse him of any moral obliquity. It is quite enough if it holds him up to ridicule. One reason for this is, that a man has a right to a respectable position in society, and is injured by anything which tends to degrade him in the opinion of his neighbors. But the reason most commonly given by courts and text writers is, that the essence of the offence of libel lies in its being dangerous to the public peace; and defamation which only makes its object ridiculous is quite as likely to make him angry and stir him to break the peace, as if it affected his pecuniary interests or exposed him to legal measures. On the same foundation rests the distinction between libel and slander; because the law considers that words, which while spoken only are fleeting and transitory, become fixed and vested by publication, and capable of indefinite diffusion, and therefore their capacity of mischief is vastly increased; hence, while libel is indictable, slander is not. The defamation may be of the dead, provided it have a tendency to stir up to revenge or violence any living friends of the deceased. A defamatory publication regarding a foreign ruler or government may be libellous, from its tendency to disturb amicable relations between the two countries; and the common law took notice of and punished libels on the government of the country, but it may be doubted if this doctrine is admissible in the United States. So it has been held that a publication is a libel which consists only of defamation of the Christian religion, of morality, or of decency. The publication may consist of any act or acts which put the defamation into distinct and apprehensible form; thus, not only printing it in any form is sufficient, but painting it, as on a sign, or drawing it, as in a caricature. Nor need the name of

any person be mentioned if it be sufficiently obvious who is thus held up to public ridicule; nor need it be given to the public, for a letter sent to but one person is publication. Again, if the defamation be published in a work of general circulation, as a newspaper, the writer, the editor, and the publisher are all and severally liable; and the editor and publisher are liable although they give the name of the writer, or even if the writer's name be appended to the article; for if the law were otherwise, it would be easy to give publicity to any libel with impunity, merely by putting to it the name of some person who was not responsible in fact, because he had nothing to lose. Nor is it held to be a defence to the editor or publisher, that he did not know the libellous character or nature of the matter published. It is as much publication if the book or paper be given away as if it be sold; and with every copy given or sold there is a repetition and renewal of the offence. It is doubtless of the essence of libel that malice enter into the act or motive; but this may be either express malice or constructive malice; that is, there may be direct proof of an actual malicious purpose in the words or act, or they may be such that the law will imply malice in the absence of proof, on the ground partly that no person could do such a thing if he were not malicious, and partly that the thing itself is so wrongful and mischievous, that the safety of society requires that the doer should be punished as if he were malicious, and that no one should be able to defend himself for doing so great a wrong by showing that it was done only through negligence or stupidity. —As to the punishment, any person guilty of libel may be indicted for the offence, as a crime against the public, and if convicted punished accordingly. But the person defamed may also bring his action for damages and recover full compensation. The punishment for libel is fine and imprisonment. This is regulated by statute in some states, and in others rests on the common law, according to which libel is a misdemeanor. By the Roman civil law, the crime of libel was punished very severely. The twelve tables made it a capital offence. By the time of Augustus usage had so modified the law, that the punishment was only corporal; but Valentinian made it once more capital, and extended the punishment of death to him who wrote or published the libel, or omitted the destroying or suppressing of it if he could do so. By a law of Alfred, the inventor of a public falsehood (*publicum mendacium*) was punished by the loss of his tongue, nor could he redeem his tongue for less than the price of his head. The laws of Greece as well as those of Rome made many distinctions in relation to the law of libel, some of which were very nice; but they do not seem to have recognized that which has been for a long time the fundamental distinction, by the law of England and of this country, between published defamation or libel and merely spoken defamation,

which, as we have seen, is only slander.—The defence against libel has presented questions which were once of great public interest; and if they are less so now, it is only because they are now quite well settled, and the law in respect to them stands on a basis which no one is disposed to disturb. The earliest question in point of time, and one of the most important in its character, which has arisen in the history of the law of libel, is in relation to the function of the jury as distinct from that of the court. In the last century there was an endeavor in the English courts to confine the question before the jury to the mere publication of the words charged, leaving it for the court to say whether the words or thing published constituted a libel. This was so held by the court of king's bench in several cases; notably in *The King v. Woodfall*, as the publisher of *Junius* (5 Burrows, 2666); and finally in *The King v. the Dean of St. Asaph* (3 T. R., 428, in notes). The powerful and very eloquent speech of Erskine in this last case attracted very general attention to the subject; and soon afterward the statute 32 George III., ch. 60 (1792), commonly called Mr. Fox's libel act, provided that in every trial of an indictment or information for libel the court should give their opinion and direction to the jury on the whole matter at issue, as in other criminal cases. This placed the whole question before the jury, who might, if they saw fit, bring in a general verdict of not guilty, although they were satisfied that the accused published the words alleged, and the court instructed them that these words constituted a libel. Still, it was thought that this question remained properly a question of law only. In 1803 the case of *The People v. Crosswell*, for an alleged libel upon Thomas Jefferson, was tried before the supreme court of New York; and the court being equally divided upon this question, an act was passed in 1805, going further than the English statute, and providing that on every trial of an indictment for libel the jury "shall have a right to determine the law and the fact, under the direction of the court, as in other criminal cases." This may now be regarded as the settled law in every part of the United States.—Another question, next in time and not inferior in importance, is how far and under what limitations the truth of the words published is a defence against a criminal charge of libel. It is conceded that the truth is a good defence against a civil action for libel; but the law is certainly not so upon the trial of an indictment for libel. It must be remembered that a libel was regarded as a crime, or a public offence, because it endangered the public peace; and as an inference from this principle, the common law did undoubtedly refuse to permit the truth of the words spoken to be any defence against an indictment for libel. Sir Edward Coke (5 Co., 125) said: "The greater appearance there is of truth in any malicious invective, so much the more provoking it is;" and Lord Mansfield only simplified and con-



densed the ancient rule in his famous saying: "The greater the truth, the greater the libel." This continued to be the law in England, until the statute 6 and 7 Victoria, c. 96, provided, in substance, that the truth should be a defence if it was published for the public benefit. In New York, by the statute of 1805, already referred to, it was enacted that the truth should be a defence, provided it were published with good motives and for justifiable ends; and this is now, either by constitutional provisions, by statute, or by adjudication, the law of every one of the United States.—Certain publications are said to be privileged; some absolutely, so that no action or prosecution can be sustained therefor; others in a qualified sense, so that the publisher is protected unless express malice is averred and proved. As an instance of the first class may be mentioned the charge of crime in due form by the prosecuting officer for the purpose of putting the party upon trial, and other cases coming within the like reasons. Of the second class the illustrations are numerous. Petitions to the legislature for a redress of grievances within its jurisdiction, or to the proper authority for the removal of an officer or agent in whose duties the petitioner is concerned, are common instances, and so are replies made to inquiries regarding the character or conduct of one who has been in the person's employ. In these and the like cases the law encourages freedom of expression, so long as there is an honest purpose to give the facts, and will not permit mistakes of fact to render a party responsible in the absence of an intent to injure. It is the settled rule in this country that the publication of legislative proceedings is privileged, and this rule is now established by statute (3 and 4 Victoria, c. 9) in England after a very determined contest. Judicial proceedings may also be published with full privilege where they are given fully and fairly, and are not merely *ex parte* proceedings or examinations. How far one is privileged in dealing with the pretensions of a candidate for public office is not very well settled. Certainly his qualifications for the office sought may be very freely discussed, but there are many cases which appear to hold that his moral character and former conduct are matters standing apart from his qualifications, and not to be discussed before the public, unless one is prepared to prove all he asserts. There are no decisions as yet which concede privilege to the publishers of news, and however careful they may be in gathering information, they cannot escape responsibility for injurious publications which prove mistaken, upon the ground solely of their own good faith and freedom from intent to injure. Upon the subject of defence, it may be proper to add, that many things which would not be sufficient for a full and technical defence (as for example, that the defendant, as printer, knew nothing of the character of the article, and had given the name of the writer), would operate strongly to mitigate the punish-

ment if the defendant were found guilty under an indictment, or to lessen the damages in a civil suit. It is proper to add also, that in the United States libels can only be punished criminally in the state courts and under state laws; it having been decided at an early day that the federal courts could not take cognizance of such cases in the absence of any law of congress, and the only law ever passed to operate within the states (the sedition law, so called, of 1798) having been repealed after a brief existence.—LIBEL is also the name of the first process in a suit in admiralty. In England the word is retained, for some purposes at least, in the canonical courts; but in the United States it is in practice confined to courts of admiralty. There are no especial forms which must be adhered to. The essentials are: 1, it should be properly addressed to the right judge; 2, it should state and designate with clearness and accuracy the parties to the action; 3, it should narrate the facts and circumstances, directly and affirmatively, upon which the libellant rests his case; 4, these should be sufficient, as stated, to give the court jurisdiction; 5, it should pray for the proper relief specifically, and the proper process, and for relief generally. A libel is sometimes "simple," that is, it tells a plain story, continuously, from beginning to end. More often it is, and perhaps it should always be, "articulate," or divided into articles, which are successively numbered, and each one of which includes some one allegation of a specific, material fact. The purpose of this is, to enable the respondent to answer definitively and specifically each part of the libellant's case; some parts he would wish to admit, others to deny, and yet others to qualify.

**LIBELT, Karól,** a Polish author, born in Posen, April 8, 1807. He took the university prize at Berlin for a Latin essay on pantheism, and graduated there in 1829. Having visited Paris, he went to Poland on the breaking out of the revolution in Warsaw, and entered the national army as an artilleryman. After the fall of Warsaw (1831) he returned to Posen, and devoted himself to agriculture. In 1840 he became an editor of the *Tygodnik literacki* ("The Literary Weekly"). Subsequently he took editorial charge of the *Rok* ("The Year"), and by means of this journal became the leading promoter of literary activity in the grand duchy. In 1846 he was arrested, with several others, on charge of treason, and imprisoned in Berlin, but was released at the revolution of 1848. He was subsequently one of the national committee in Posen, and was elected to the Slavic congress at Prague, to the second Prussian chamber, and to the German national assembly at Frankfurt. He founded at Posen in 1849 a democratic journal entitled *Dziennik polski*, which was suppressed within a year. Since 1859 he has been a member of the Prussian house of delegates, and a leader of the Polish party. He has published in Polish or German a number of works on mathematics, philosophy, and rural econo-

my, including *Wykład matematyki* ("Course of Mathematics," 2 vols., Posen, 1844); *Filozofia i krytyka* (5 vols., 1845-50); *Dziewica orleańska* ("The Maid of Orleans," 1847); a work on ethics entitled *Umnictwo* (1849); and *Estetyka* ("Aesthetics," 3 vols., 1851).

**LIBER.** See BACCHUS.

**LIBERIA**, a republic on the W. coast of Africa, between lat. 4° 20' and 7° 20' N., extending from the Sherbro river on the northwest, near the S. boundary of the British colony of Sierra Leone, to the Pedro river on the southeast, a distance along the coast of nearly 600 m. All the territory between these two points has been purchased from the original proprietors. The interior boundaries of the purchased tracts extend from about 10 to 40 m. from the coast, and are gradually enlarged, as the interior tribes are generally very willing, and some of them anxious, to sell their territories. In 1873 the area over which the political jurisdiction of the republic actually extended was estimated at 9,700 sq. m. It is divided into four counties, Mesurado, Grand Bassa, Sinou, and Maryland. The capital and largest town is Monrovia, a seaport on Cape Mesurado, with about 13,000 inhabitants. The most important among the other settlements are New Georgia, Caldwell, Virginia, Kentucky, Millsburg, Marshall, Edina, Buchanan, Bexley, Greenville, Readsville, Lexington, and Louisiana. The principal towns of Maryland are Harper and East Harper. The general line of the coast is from N. W. to S. E. There are several inlets and harbors at Cape Mount, Cape Mesurado, Cape Palmas, and Bassa Cove. There are many rivers, none of which are navigable more than 20 m. from their mouths. The most important is the St. Paul, which enters the ocean at Cape Mesurado. It is about half a mile wide, and at low tide has 7 ft. of water on the bar at its mouth. It is navigable only about 18 m. from the sea. The other largest rivers are the St. John, which empties at Bassa Cove; the Junk river, which runs between the St. Paul and the St. John; Cape Mount river, which flows into the sea at Cape Mount; and the Grand Sesters, E. of the St. John, which has 14 ft. of water over the bar at its mouth. The land on the coast is generally low and sandy, except near the capes, which are elevated, and in the southeast, where the shore is bold and rocky. From the coast the land gradually rises, until at the distance of 30 m. inland it swells into forest-covered hills, and in the remoter interior into mountain ridges divided by fertile valleys. The soil is generally good, though there is some poor land. It is of a yellowish color, and tinges the rivers which flow through it. There is little swamp land, the country being almost universally broken and rocky or gravelly. The climate is that common to regions near the equator. There are two seasons, the wet and the dry, the former beginning with June and ending with October. Rain falls

during the greater part of this season, though not without intervals of clear skies and successive days of fine weather, especially in July and August. In the dry season rain is rare, though there are occasional showers. The average heat of the year in Monrovia is 80° F., that of the rainy season being 76° and of the dry 84°. The mercury seldom rises above 90° in the shade, and never falls below 60°; the daily variation seldom exceeds 10°. June is the coolest month, and January the hottest. During the hottest months, January, February, and March, the heat is mitigated by the constant winds, the land breeze blowing from midnight until near midday, and the sea breeze from midday until near midnight. The climate both on the coast and in the interior is deadly to the white man, and though less fatal is still formidable to the black man born and reared in temperate regions. Strangers soon after their arrival are attacked with a fever called acclimating, which seems to be caused not by the heat, but by miasmata of the origin and character of which little is known. This sickness indicates its approach by headache, pains in the back, loss of appetite, and more or less gastric derangement, and rapidly develops into bilious remittent fever. This sometimes yields to mild medical treatment, and the patient is then prepared to endure ordinary exposure to the climate. Generally, however, the disease assumes the tertiary or other form of intermittent fever, accompanied by bilious vomiting, a dull expression of the eye, and in the febrile paroxysms intense headache and delirium. This is the African fever, and is frequently fatal. To the white man there is no acclimation in Liberia; the first attack of the fever does not secure him from subsequent attacks. To the natives the climate is not unfavorable; they are robust and have few diseases, and many of them live to a great age.—Iron ore abounds in Liberia, and it is said that copper and other metals exist in the interior of the country. The vegetables are almost endless in their variety. The most important of the native trees are rosewood, teak, mahogany, hickory, poplar, brimstone wood (so called from its yellow color), sassa wood, and many others valuable in ship building and cabinet work. Camwood and other dyewoods, ebony, the acacia which yields gum arabic, and the copal tree are found. There are several varieties of palm, all highly useful, especially the nut-bearing palm from which palm oil is made. Medicinal plants abound; among them are the copaiba tree, the *croton tiglium*, which yields the croton oil, the castor oil plant, and the *ricinus major*, whose seeds produce a highly purgative oil, and whose wood is much used for hedges and fences. Several varieties of maize and rice of excellent quality are cultivated, and on the highlands of the interior good crops of wheat, barley, and oats have been raised. Cotton flourishes, and sugar cane and excellent coffee are easily produced. The

esulent and farinaceous roots chiefly cultivated are the sweet potato, the cassava, the yam, the tenia, which in flavor resembles the potato, and the arrow root. Cabbages, beans, peas, tomatoes, beets, cucumbers, and almost all the common garden vegetables known in America, thrive when planted in the proper season. The fruits are numerous and fine. Among them are the mango, lemon, lime, orange, guava, tamarind, pomegranate, coconut, plantain, banana, rose apple, African cherry, pineapple, avocado pear, and the African peach. Wild animals are becoming scarce in Liberia, and the elephant, hippopotamus, leopard, crocodile, boa constrictor, and deer, formerly abundant, are now rarely met with. Monkeys, guanas, chameleons, lizards, and ants in great variety, abound in the forests. The driver ants, which travel from place to place in countless multitudes, are welcomed by the people, for when they enter a house they soon clear it of every other species of insect and vermin. —The population of Liberia is composed of colored emigrants from the United States and their descendants, who are the ruling class, and of uncivilized native tribes. The total population, according to the latest official estimates of the Liberian government, amounts to about 720,000, of whom 19,000 were Americo-Liberians, and the remaining 701,000 aboriginal inhabitants. The colonists live in houses generally a story and a half high, built of wood upon a basement of stone, with a porch in the front and rear, and in Monrovia and the other towns standing in yards enclosed with wooden palings or stone walls built without mortar. The moisture of the climate and the ravages of a species of termite cause wood to decay very rapidly, and give the towns an old and dilapidated appearance; and in the newer dwellings stone or brick is more used. The native method is to build of wattles and mud. The yards are planted with tropical fruit trees, and are sometimes very handsome. The better dwellings are well and even elegantly furnished. The natives generally wear a single loose garment, leaving the head and feet bare; but the colonists dress like Europeans, and in Monrovia are rather distinguished for dressing well. They are strict observers of the Sabbath, and have many churches, to which they give a full and constant attendance. There is a regular system of common schools, high schools, and a college. In 1870 there were in Mesurado county 36 public schools, with 37 teachers and 1,155 pupils. The Methodist Episcopal church has organized the Liberia mission into an annual conference, with a missionary bishop at its head. The mission in 1872 had 24 missionaries, 26 churches, 15 day schools, and 2,239 members, inclusive of probationers. The Protestant Episcopal church also supports at the head of its mission a missionary bishop, and in 1871 had 10 Liberian and 14 native stations, 13 clergymen, 9 churches, 1 chapel, and 453 communicants. The Baptist

churches in 1868 organized the Liberian Baptist missionary union for the evangelization of the heathen within the borders of the republic and contiguous thereto, at the first meeting of which 10 Baptist churches were represented. A training school for Baptist preachers and teachers has been established at Virginia. The Presbyterian churches of Liberia have an aggregate membership of about 250, and form with those of Gaboon and Corisco the presbytery of Western Africa.—The native population under the jurisdiction of the republic comprises a variety of tribes, of whom the principal are the Veys, the Pessehs, the Barlines, the Bassas, the Kroos, the Grebos, and the Mandingos. The Veys, who extend from Gallinas, their northern boundary, southward to Little Cape Mount, and inland about two days' journey, are considered superior to all other tribes on the coast, except the Mandingos, in morals and intelligence. They invented about 30 years ago an alphabet for writing their own language. As they are in constant intercourse with the Mandingos and other Mohammedan tribes of the interior, Mohammedanism is making rapid progress among them. The Protestant Episcopal church of the United States has established a mission school among them at Totocoreh. The Pessehs live about 70 m. from the coast, and extend about 100 m. from N. to S. They supply most of the domestic slaves for the neighboring tribes. A mission begun among them by the Presbyterian board of foreign missions has been abandoned, and the tribe is still entirely pagan. The Barlines are the tribe next interior to the Pessehs, and have recently been brought into treaty relations with Liberia. Their capital, Palaka, contained in 1858 a population of 8,000, half of whom were Sunni Mohammedans; but according to the account of W. Spencer Anderson, the latest explorer, there were no longer any Mohammedans in the Barline country. The Bassas, who occupy a coast line of over 60 m., and extend about the same distance inland, are the great producers of palm oil and camwood, of which thousands of tons are annually sold to foreigners. American Baptist missionaries established a mission among them in 1835, and reduced their language to writing. Recently the son of a subordinate king of the Grand Bassa people, Jacob M. Vonbrunn, has displayed great zeal in behalf of Christianity and civilization. The Kroos, who occupy the country S. E. of the Bassas, are a powerful tribe, extending about 70 m. along the coast and only a few miles inland. They are black and woolly headed, and are a stout brawny race, very industrious, and peculiarly fond of working on board ships. They are good seamen, and generally speak English. The greatest ambition of a Krooman is to marry many wives; this is said to be the chief reason why they wander from home and labor on ships. When one of them has earned money enough to buy a wife, he returns to his native village, marries, and remains a while at

home. When he desires another wife, he goes to sea again. As he grows old he retires altogether from the ocean, and lives in ease and plenty supported by the labor of his wives, who cheerfully work to maintain him in comfort. The Kroos are mostly idolaters, though they believe in one supreme God. A mission begun among them by the Presbyterian board of foreign missions, about 30 years ago, has been abandoned. The Grebos border upon the S. E. boundaries of the Kroos, and extend from Grand Sesters to the Cavally river, a distance of about 70 m. Christian missions have been in operation among them since 1834, their language has been reduced to writing, and a number of books have been published in it. The Mandingos are the most interesting and promising tribe in the territory of Liberia. They are found on the whole of the eastern frontier and extend back to the heart of Soodan; and were the Liberian government further to extend its jurisdiction over them, it might exert through them a powerful influence upon the interior. They have books and schools and mosques in every large town. They read and write, and many of them speak the Arabic language. Through their influence, Mohammedanism has spread widely among the neighboring tribes.—The principal farming region of Liberia is on the banks of the St. Paul river. The chief staple is sugar, of which the crop in 1871 was estimated at 300,000 lbs. Sugar is also the chief manufacture, but there are several woollen mills, and Marshall, at the mouth of the Junk river, is noted for the manufacture of lime from shells. There is a considerable traffic carried on with the natives by the petty merchants, who buy palm oil, rice, camwood, skins, and other articles, for tobacco, powder, cheap cutlery, and cotton cloths. The more wealthy buy from these, and sell again to the English and American merchant vessels, or ship directly. The Liberians have built and manned about 30 coast traders, and they have a number of vessels engaged in commerce with Great Britain and the United States; and a steamer every six days connects the W. coast of Africa with Liverpool, England. The chief articles of export are palm oil, palm nuts, ivory, arrow-root, coffee, and sugar. Commerce is carried on mainly with Great Britain, the United States, Belgium, and Hamburg. The republic has concluded commercial treaties with Great Britain, France, Belgium, Denmark, Italy, the Netherlands, Sweden and Norway, Portugal, and Austria. The public revenue from 1866 to 1870 averaged \$110,000, nearly the whole of which (about \$95,000) is derived from customs duties. The chief items of public expenditure are those for the civil service (\$40,000), the maintenance of an armed force (\$13,000), and the administration of justice (\$7,000). A public debt was for the first time contracted in 1871, when a loan of \$500,000 at 7 per cent. interest, to be redeemed in 15 years, was issued in London at the

price of 85 per cent.—The constitution of the republic of Liberia provides for the maintenance of the following fundamental principles: All men are born equally free in the right of enjoying and defending life, liberty, and the pursuit of happiness. All power of government is inherent in the people. Slavery shall not exist in the republic, or be countenanced by any of its citizens. All elections shall be by ballot, and every male citizen possessing real estate shall have the right of suffrage. None but citizens may hold real estate in the republic. None but persons of color shall be admitted to citizenship, a provision which is intended to be of but temporary duration. The legislative body is styled "the legislature of Liberia," and is composed of a senate and a house of representatives. Each county is entitled to two senators, who are elected for a term of four years. Representatives are elected biennially, every county being entitled to one representative and an additional one for every 10,000 inhabitants. The president is elected by the people for a term of two years. With the consent of the senate he appoints the secretaries of war, the navy, treasury, and state, the postmaster general, the judges, and many other officers civil and military. The judicial power is vested in a supreme court and several subordinate courts.—The republic owes its origin to the American colonization society (see COLONIZATION SOCIETY), which in 1820 sent the first colonists from the United States to the Sherbro islands, who eventually, however, settled at Cape Mesurado in 1822. In 1847 the declaration of independence was made, and a constitution adopted. The first president was Joseph Jenkins Roberts, who served for four terms (1848-'56). His successors have been Stephen Allen Benson (1856-'64), Daniel Basil Warner (1864-'8), James Spriggs Payne (1868-'9), and James Roye (1870-'71). Roye contracted a loan in England, and was on his return accused of having appropriated the money thus obtained for his own benefit and that of the members of the cabinet. A popular rising took place in Liberia; the president was imprisoned, and an executive committee intrusted with the government, until in May, 1871, the first president, J. J. Roberts, was again placed at the head of the government. As Roye attempted to assert his claims to the presidency by force, he was again imprisoned. Having escaped, he was drowned at the beginning of 1872, while endeavoring to reach by swimming a steamer leaving for Liverpool.—See "The Republic of Liberia," by G. S. Stockwell (New York, 1868), and "The Republic of Liberia, its Status and its Field," by E. W. Blyden, a negro, professor in Fourah Bay college, Sierra Leone ("Methodist Quarterly Review," New York, July, 1872).

**LIBERIUS**, a saint and pope of the Roman Catholic church, born in Rome about 300, died there in 366. He was made a deacon by Sylvester I., and elected, against his will,

bishop of Rome in May, 352. He received soon after his election a deputation of Arian bishops, who demanded in the name of the emperor Constantius the condemnation of St. Athanasius. Liberius called an assembly of bishops in Rome to hear both parties, in which it was decided to hold a plenary council of the eastern and western churches at Aquileia in northern Italy; but this design could not be carried out till the death in 353 of the usurper Magnentius, who held the passes of the Alps. The emperor Constantius having spent the winter at Arles, it was resolved to hold a council there in October, 353. At this no doctrinal discussion was allowed, but all the prelates present were required, under pain of deposition, banishment, and confiscation, to subscribe an imperial edict condemning Athanasius. This being deemed an implicit denial of the orthodox faith, of which Athanasius was considered to be the champion, the western bishops at first refused their assent, but finally yielded, it is thought partly from fear, and partly from the representations of the court party of Arian prelates that the matter was one of discipline. The papal legate, Vincentius, bishop of Capua, was subjected to special violence, and subscribed the edict. Paulinus of Treves and two other bishops were banished. This drew from Liberius a letter of indignant reproof to the emperor, and another full of grief to Hosius of Cordova. He demanded of the emperor that another council should be called at Milan in 355, at which the pope was represented by Eusebius, bishop of Vercelli, and the Roman deacon Hilarius. The assembly was held in the imperial palace, Constantius appearing to demand the condemnation of Athanasius as that of his personal enemy, and threatening with instant death all who would not comply with his will. Many yielded, Eusebius of Vercelli and others were exiled, and the deacon Hilarius was publicly scourged. Liberius immediately protested, and wrote an encyclical letter to the exiles. The eunuch Eusebius, the imperial chamberlain, was sent to Rome for the purpose of gaining Liberius by threats and rich presents. The latter he refused, and replied to the threats that he could not condemn an absent man, one especially who had been exculpated by two plenary councils. He was arrested, carried away by night, and taken to Milan. The interview between him and Constantius is minutely related by the historian Theodoret. Liberius was given three days to deliberate; but remaining firm, he was exiled to Berœa in Thrace. Hosius of Cordova, too, was exiled to Sirmium in Lower Pannonia. The deacon Felix, by order of Constantius, was consecrated bishop of Rome, but refused to subscribe any heterodox formulary. Constantius, bent solely on making his theological creed prevail, entered Rome in April, 357. He was immediately called on by a deputation of Roman ladies, who demanded the recall of Liberius. To this the

emperor assented, adding that Felix and Liberius should govern the Roman church together. In 358 Liberius was restored to his see. In 359 he condemned the acts of the council of Rimini, and excommunicated all those who had subscribed the Arian profession of faith drawn up there. For this he was once more persecuted by Constantius, and obliged to hide himself in the catacombs. He built the basilica of Santa Maria Maggiore, which is called after him *Liberiana*. His feast is celebrated by the Latin church on Sept. 23.—Liberius is chiefly known in church history from the accusation brought against him by Blondel and most Protestant historians, as well as by many Roman Catholic writers of high authority, of having obtained his recall from exile by condemning St. Athanasius, and subscribing one of the three doctrinal formularies drawn up at Sirmium by the Arians. This controversy has been revived of late years in connection with the council of the Vatican and the doctrine of papal infallibility. Those among Roman Catholic theologians who maintain the innocence of Liberius, endeavor to show that the two letters said to have been addressed by him to Ursacius and Valens and the eastern bishops, in condemnation of Athanasius, bear intrinsic evidence of another authorship; that the passages of Athanasius in which mention is made of the fall of Liberius are manifestly interpolated; and that the "fragments" attributed to St. Hilary of Poitiers condemning this pontiff are not genuine. Moreover, they labor to prove that it is improbable or impossible that Liberius should have subscribed any of the three formularies mentioned. Such is the view taken by the Bollandist Stilling, in the *Acta Sanctorum* for Sept. 23, and by Édouard Dumont, in the *Revue des questions historiques*, for July to September, 1866. See also Neander's "Church History," and Herzog's *Real-Encyclopædie*.

**LIBERTY.** I. A S. E. county of Georgia, bordering on the Atlantic, and partly bounded on the S. W. by the Altamaha river; area, 660 sq. m.; pop. in 1870, 7,688, of whom 5,260 were colored. The surface is level, and the soil fertile. The Atlantic and Gulf railroad passes through it. The chief productions in 1870 were 131,845 bushels of Indian corn, 58,096 of oats, 23,012 of peas and beans, 95,325 of sweet potatoes, 2,090 bales of cotton, and 1,219,430 lbs. of rice. There were 1,078 horses, 5,026 milch cows, 10,307 other cattle, 3,073 sheep, and 14,808 swine. Capital, Hinesville. II. A N. W. county of Florida, lying between the Ockloconee river on the E. and the Appalachicola on the W.; area, 900 sq. m.; pop. in 1870, 1,050, of whom 323 were colored. The surface is level, and the soil sandy. The chief productions in 1870 were 10,865 bushels of Indian corn, 11,675 of sweet potatoes, 120 bales of cotton, 11 hogheads of sugar, 5,418 gallons of molasses, and 13,660 lbs. of rice. There were 70 horses, 670 milch cows, 2,333



other cattle, 940 sheep, and 2,472 swine. Capitol, Bristol. III. A S. E. county of Texas, bounded S. W. by Galveston bay and the San Jacinto river, and intersected by the Trinity; area, 1,600 sq. m.; pop. in 1870, 4,414, of whom 1,975 were colored. The surface is about equally divided between timber and prairie land. The soil along the Trinity is very fertile; elsewhere it is generally light and sandy. Stock raising is the chief pursuit. The Texas and New Orleans railroad traverses it. The chief productions in 1870 were 98,087 bushels of Indian corn, 21,890 of sweet potatoes, 1,881 bales of cotton, 9 hogsheads of sugar, 1,663 gallons of molasses, and 7,775 lbs. of rice. There were 2,190 horses, 2,706 milch cows, 24,315 other cattle, 1,458 sheep, and 7,344 swine. Capital, Liberty.

**LIBERTY**, a town and the capital of Clay co., Missouri, on the Kansas City division of the Hannibal and St. Joseph railroad, 3 m. N. of the Missouri river, and 13 m. N. E. of Kansas City; pop. in 1870, 1,700, of whom 342 were colored. It occupies a healthy site, and is surrounded by a rich farming district abounding in coal and limestone. It contains a machine shop, two woollen factories, two savings banks, a weekly newspaper, several schools, and six churches. It is the seat of Liberty female college, and of William Jewell college, both under the control of the Baptists. The latter institution was organized in 1848, and has a theological department. In 1873-'4 the whole number of professors was 9; of students, 127; volumes in library, 3,000.

**LIBOCEDRUS** (Lat. *libanus*, frankincense, and *cedrus*, the cedar), a small genus of evergreen



*Libocedrus decurrens*.

coniferous trees, resembling the *Thuja* or arbor vite, from which it mainly differs in the structure of the small cones, the scales of which do not, as in *Thuja*, overlap at the edges. Two species are found in New Zealand, two in the mountains of Chili, and one in the sierras

of California, where it is abundant in some localities, but is seldom found at an elevation below 4,000 or 5,000 ft. Our species was first made known by the collections of Fremont, and was by Torrey named *L. decurrens*; the bases of the small, acute, scale-like leaves being decurrent upon the stem in a manner which readily distinguishes it from other trees of similar appearance. It grows to the height of 120 to 140 ft., with a trunk 6 or 8 ft. in diameter, and perfectly free from branches for 80 to 100 ft. The wood, which is yellowish, is highly valued, and is regarded as even superior to redwood in durability; the Californians call it "white cedar," a name which properly belongs to a very different tree. The bright glossy green of its foliage, and the graceful habit of the tree when young, make this one of the most ornamental of evergreens, and it would be in great request were its hardiness well established; it has proved hardy in the vicinity of New York, but not so at Rochester. Both English nurserymen and authors strangely confound this tree with *Thuja gigantea*; the two are readily distinguished by the character of the leaves already mentioned. The exotic species are less hardy than the Californians and, while they may prove useful in the southern states, are of no value to northern planters.

**LIBOURNE**, a town of France, in the department of Gironde, 16 m. E. N. E. of Bordeaux; pop. in 1866, 14,639. It is beautifully situated at the entrance of the Isle into the Dordogne, which are respectively crossed here by large bridges, and on the railway from Tours to Bordeaux. It is well built, and contains a large square and fine houses and promenades. Among the various schools is one of hydrography. It has manufactories of woollen and other goods, ship yards and iron founderies, and an active trade in local products, particularly in wine, which passes for Bordeaux wine, though of very inferior quality. The port admits vessels of 300 tons, and was known to the Romans. In the 13th century it was fortified by Leyburn, an English knight from whom its present name is derived. It was the principal of the *bastides* or free towns founded by Edward I. at the highest point on the Dordogne suitable for English ships engaged in the wine trade, and at one time it seemed likely almost to rival Bordeaux. In the 16th century it was the focus of insurgent peasants, who were known as *les gùitres*. The parliament of Bordeaux was transferred to Libourne on several occasions.

**LIBRARY** (Lat. *librarium*, a bookcase), a collection of books designed for use and preservation; also the repository of such a collection. Although the English word comes directly from the Latin, the Romans usually designated a library by the Greek word *bibliotheca*, which has been adopted into almost every cultivated language excepting the English. Libraries are probably nearly coeval with the art of writing. The oldest of which we have any record is

that of the Ramesseum, a temple founded in Thebes by Rameses II., in honor of his father Seti I., the Osymandias of Diodorus. According to Hecataeus, one of its rooms was the depository of the histories and records of the priests, a statement which seems to have been substantiated by the researches of Egyptologists. Another great library existed at an early date in Memphis, but the most famous of all ancient libraries was that founded early in the 3d century B. C. by the Ptolemies in Alexandria. (See ALEXANDRIAN LIBRARY.) Layard discovered in the ruins of the palace of Koyunjik the library of the Ninevite kings, consisting of a large number of tablets of clay, impressed before burning with inscriptions in cuneiform characters; they had originally been paged and preserved in cases. Several thousands of these tablets are now in the British museum. The Hebrews preserved their sacred writings in the temple. The kings of Persia also had collections of books and of archives.—According to Anlus Gellius and Athenæus, the first library established in Greece was founded at Athens by Pisistratus; but Strabo says that Aristotle's collection was the first. The former library is said to have been carried to Persia by Xerxes, and finally restored to Athens by the emperor Hadrian; the latter was purchased by Ptolemy Philadelphus and added to that of Alexandria. Polycrates also formed a library at Samos at an early date. Next to the Alexandrian library, that founded by Eumenes II., king of Pergamus, was the most celebrated of antiquity. Plutarch says it contained 200,000 volumes, and it probably continued to increase in numbers and value until the time of Mark Antony, who transported it as a present to Cleopatra to Alexandria, where it became a part of its more famous rival and finally shared its fate. About 167 B. C. Paulus Æmilius carried to Rome a library, the spoil of his campaign in Macedonia; but to Asinius Pollio belongs the honor of founding the first Roman public library, in the *atrium libertatis* on Mount Aventine. Sulla carried from Athens to Rome the library of Apellicon the Teian; Lucullus made a large collection, and his galleries and porticoes became a favorite resort for conversation; Varro, Atticus, and Cicero were enthusiastic collectors of books. One of the unfulfilled projects of Cæsar was the formation of a public library which should contain all the works in Greek and Latin literature. Augustus established the Octavian and Palatine public libraries, the latter of which continued until the time of Pope Gregory I. More important was the Ulpian library, founded by Trajan. At a later period 28 public libraries are mentioned as existing in Rome, besides many valuable private collections. All of these perished in the barbarian invasions. The library of Constantinople, founded by Constantine, and enlarged by Julian and the younger Theodosius to the number of 120,000 volumes, was partially

burned by the iconoclasts in the 8th century under Leo the Isaurian. This disaster was repaired by Constantine Porphyrogenitus, who restored and enlarged the collection. After the fall of the Byzantine empire it was preserved by the command of Mohammed II. in the seraglio, and was either destroyed by Amurath IV. or perished by neglect. Libraries were founded from the 9th to the 11th century, especially by the imperial family of the Comneni, in the cloisters on the islands of the archipelago and on Mt. Athos.—When Christian Europe was plunged in ignorance, the Moslems cultivated letters with assiduity, and made large collections of books. They had an important library in Alexandria and another in Cairo. The latter, which is said to have been the largest in the Mohammedan dominions, is said by some of the Arab writers to have numbered 1,600,000 volumes. Other great Arabian libraries were at Bagdad, Tripoli in Syria, and Fez. Under Moslem domination Spain possessed 70 public libraries; that at Cordova contained 400,000 volumes.—In the West, after the fall of the Roman empire, learning was confined to the monasteries, and almost all libraries, up to the 14th century, belonged to ecclesiastical institutions. They were generally small, comprising only the wreck of the collections dispersed by the barbarians. Among the cultivators of learning in the dark ages the Benedictines stood foremost, and to their careful reproduction of manuscripts the world is indebted chiefly for the preservation of the classics. At Monte Casino, Bobbio, and Pomposia in Italy; Cluny, St. Riquier, and Fleury in France; Marburg, Sponheim, Reichenau, and Korvei in Germany; St. Gall in Switzerland; Canterbury, Croyland, Yarrow, Bury St. Edmunds, Whitby, York, Durham, and Wearmouth in England, and other monasteries, were collected valuable libraries which became the nuclei of the great collections of later times. With the revival of learning began a new era in the history of libraries. The fall of Constantinople sent numbers of learned men into the West, who brought with them many valuable manuscripts. A zeal for the collection and preservation of books arose. Scholars traversed Europe and parts of Asia and of Africa in search of literary treasures, and in a few years most of the classic authors now known were to be found in the libraries of the great cities of Italy, Germany, and France. Several of the largest of the European libraries date from this period, among them those of Prague, Paris, Vienna, the Vatican, and the Laurentian of Florence, founded by Lorenzo de' Medici. The splendid collection made at Buda by Matthias Corvinus, king of Hungary, which is said to have numbered 50,000 manuscripts, and that of Frederick, duke of Urbino, belong to this time. The former, which was scattered at the capture of Buda by the Turks in 1526, has been almost entirely lost, only about 125 of its treasures

being known to exist. Nearly one half of these are preserved in the imperial library at Vienna. The Urbino library is partly in the Vatican and partly in other collections. The invention of printing, by increasing the number and reducing the cost of books, made possible the formation of many public libraries, which soon sprang up in all the considerable towns of Germany, Italy, and France; and in these and the several university libraries were gradually merged most of the small collections of the monasteries which were suppressed after the reformation.—The following table shows the condition in 1874 of all the larger libraries of Europe:

EUROPEAN PUBLIC LIBRARIES CONTAINING  
100,000 VOLUMES OR MORE.

PLACE.	Name.	When founded.	Printed vols.	MSS.
Cambridge...	University	1475	400,000	3,000
Dublin	Trinity College	1601	145,000	1,600
Edinburgh	Advocates'	1680	300,000	....
Edinburgh	University	1580	130,000	3,000
Glasgow	University	1473	105,000	....
Liverpool	Public	1850	100,000	....
London	British Museum	1753	1,100,000	....
Manchester.	Public	1852	120,000	....
Oxford	Bodleian	1598	310,000	30,000
Aix	Mejanes	1418	100,000	1,200
Bordeaux...	City	1738	140,000	200
Lyons	City	....	165,000	2,400
Paris	National	1850	2,000,000	150,000
Paris.	Arsenal	1781	225,000	6,000
Paris.	Ste. Geneviève	1624	200,000	3,500
Paris.	Mazarin	1660	160,000	4,000
Paris.	Sorbonne	....	140,000	1,000
Paris.	Institute.	1759	100,000	....
Paris.	City	1759	100,000	....
Rouen	City	1809	120,000	1,000
Troyes	City	....	100,000	5,000
Augsburg	City	1397	150,000	....
Berlin	Royal	1850	700,000	15,000
Bonn	University	1818	200,000	1,000
Breslau	University	1811	350,000	2,500
Carlsruhe	City	....	105,000	....
Cassel	Electoral (now royal)	1580	100,000	400
Darmstadt	Grand ducal	1760	300,000	4,000
Dresden.	Royal	1555	500,000	3,000
Erlangen	University	1743	120,000	1,000
Frankfort	City	....	100,000	....
Freiburg	University	1454	170,000	....
Glessen	University	1607	100,000	1,500
Gotha	Ducal	1640	150,000	5,000
Göttingen	University	1784	400,000	5,000
Greifswald	University	1604	100,000	....
Halle	University	1696	100,000	....
Hamburg	City	1829	200,000	5,000
Hanover	Royal	1690	120,000	2,000
Heidelberg	University	1703	220,000	2,000
Jena	University	1548	200,000	....
Kiel	University	1665	140,000	....
Königsberg	University and city.	1544	220,000	....
Leipsic	University	1548	200,000	2,500
Leipsic	City	1677	170,000	2,000
Marburg	University	1527	130,000	....
Mentz.	City	....	120,000	1,500
Munich	Royal	1660	900,000	22,000
Munich	University	1575	230,000	2,000
Rostock	University	1419	120,000	....
Strasburg	City	1581	300,000	....
Stuttgart.	Royal	1765	450,000	3,500
Trèves.	City	1773	100,000	....
Tübingen	University	1477	200,000	2,000
Weimar	Grand ducal	....	150,000	2,000
Wolfenbüttel.	Ducal	1604	200,000	5,000
Würzburg.	University	1403	100,000	1,500
Cracow	University	1364	140,000	5,400
Pesth	National	1804	200,000	....
Pesth.	University	....	105,000	1,600
Prague	University	1350	142,000	4,000
Vienna	Imperial	1440	600,000	20,000

European Public Libraries—continued.

PLACE.	Name.	When founded.	Printed vols.	MSS.
Vienna	University	1777	160,000	....
Zürich	City	1832	100,000	....
Bologna	University	1690	200,000	6,000
Florence	National	1864	200,000	14,000
Milan	Ambrosian	1609	100,000	15,000
Milan	Public (Brera)	1763	185,000	....
Modena.	Este	....	100,000	3,000
Naples	National (Bourbon).	1780	200,000	5,000
Padua	University	1629	100,000	1,500
Parma	Public	....	140,000	....
Rome	Casanatense	1700	100,000	2,000
Rome	Angelic	1605	100,000	3,000
Rome	Vatican	1378	105,000	25,500
Turin.	University	1486	125,000	....
Venice	St. Mark's	1468	200,000	10,000
Madrid	National	1712	200,000	5,500
Lisbon	National	1796	150,000	10,000
Hague	Royal	1795	100,000	....
Brussels	Royal	1400	250,000	20,000
Copenhagen	Royal	1550	550,000	25,000
Copenhagen	University	1731	200,000	5,000
Christiania	University	1811	200,000	....
Lund	University	1671	100,000	1,000
Stockholm	Royal	1540	125,000	5,000
Upsal	University	1621	150,000	3,000
Helsingfors...	University	1630	140,000	....
Kiev	University	1833	110,000	....
Moscow	University	1755	160,000	....
Moscow	Museum	....	165,000	5,000
St. Petersburg	Imperial	1714	1,100,000	35,000
St. Petersburg	Academy of Sciences	1726	120,000	....
Athens.....	University	1837	125,000	600

In consequence of the rapid increase of many of the European libraries, and discrepancies in authorities, some of the figures in this table vary from those previously given in articles on the several cities and towns. It is probable that other libraries are large enough to be included in the list, but it is difficult to obtain statistics regarding them. There are several other collections in London which number nearly if not quite 100,000 volumes; the library of the university of Aberdeen has over 90,000, and that of St. Andrews nearly as many. There are several private libraries in England which number over 50,000 volumes each. The five principal libraries of Great Britain, the British museum, Bodleian, Cambridge university, Advocates' of Edinburgh, and Trinity college of Dublin, are each entitled by statute to a copy of every book published in the empire. In France, the town libraries of Marseilles, Besançon, Versailles, and Grenoble contain from 75,000 to 90,000 volumes each; and those of Avignon, Caen, Chartres, Le Mans, Nîmes, and Douai, from 50,000 to 75,000. The library of the Louvre in Paris, which numbered 90,000 volumes, remarkable for splendid bindings, was partly destroyed by the communists in 1871. The two libraries of St. Cloud and Meudon, which were removed into Paris shortly before the siege, have since been added to it, and probably it now contains more volumes than before. In Germany, the city libraries of Münster and Bamberg contain more than 75,000 volumes each, the commercial library of Hamburg has more than 60,000, the university of Erfurt about the same, and

there are many others of 50,000 and upward. The largest private library in Germany is that of the prince von Oettingen at Wallerstein in Bavaria, containing 100,000 volumes; that of Prince Thurn and Taxis at Ratisbon has nearly as many; and there are several other private collections numbering nearly 50,000 volumes. The library of Strasburg, which contained about 220,000 volumes of printed books and many valuable manuscripts, was partly burned during the siege of the city by the Germans in 1870; it has since been restored by contributions from the German publishers, and now has at least 80,000 volumes more than when injured. Austria possesses a number of valuable libraries besides those mentioned in the table. In Vienna the library founded by Francis I. has 75,000 volumes, and the private collections of the archduke Albrecht and of the princes Liechtenstein, Esterházy, Schwarzenberg, and Metternich have over 50,000 each. The private library of Prince Lobkowitz at Prague contains 70,000 volumes, and he has another of 40,000 in his castle of Raudnitz on the Elbe. In Prague are also the private libraries of the princes Kinsky and Fürstenberg, containing respectively 40,000 and 30,000 volumes. The university of Gratz has 70,000 volumes, those of Innsbruck and Olmütz 60,000 each, and that of Lemberg 55,000. In 1870 Cisleithan Austria had in all her public and private libraries 5,756,066 volumes. In Holland, the university of Leyden has 90,000, and that of Utrecht 75,000 volumes. In Belgium, the libraries of Ghent, Liège, and Louvain have about 90,000 volumes each. In the city and province of Rome there were in the various convents previous to their suppression libraries containing in the aggregate 770,000 printed volumes and 12,000 manuscripts. These were all taken possession of by the government, and will be in part distributed, it is reported, among the other great libraries, and the remainder formed into a new public library. The Alessandrina library in Rome has 70,000 volumes. The national library of Florence was formed in 1864 by the union of the Magliabecchian (founded in 1714) and the Palatine or library of the Pitti palace. The Marucellian of Florence contains about 60,000 volumes, and the Riccardian about 30,000. The Brancaccian of Naples has more than 75,000, and the library of the university of Palermo more than 80,000 volumes. According to the report of the minister of public instruction for 1871-2, the total number of public libraries in Italy, including university, lyceum, gymnasium, and former convent libraries, was 687. In Russia, the universities of Kazan and Kharkov possess each about 70,000 volumes, and that of Dorpat has 80,000. The great imperial library of St. Petersburg owes many of its treasures to the spoils of Poland, particularly of the Zaluski library of Warsaw, which, when transported to Russia by Suvaroff in 1795, contained 300,000 volumes of printed books and many valu-

able manuscripts. The national library in Lisbon is wholly the growth of the present century. When the reigning family of Portugal emigrated to Brazil in 1807, the royal library was carried to Rio de Janeiro; it now forms the imperial library of Brazil, and numbers upward of 100,000 volumes. The private library of the late royal family of Spain contained nearly 100,000 volumes; that of the Escorial, although rich in manuscripts, has only about 40,000 printed books. Switzerland possesses 25 public and cantonal libraries, which contain in the aggregate 925,000 volumes. Those at Neufchâtel, Lausanne, Bern, Aargau, Geneva, Lucerne, and Basel contain from 50,000 to 95,000 volumes each. There are also in Switzerland 1,629 other libraries, containing about 700,000 volumes. Constantinople has several libraries, but they are all very small, and do not contain in the aggregate more than 40,000 or 50,000 books. The khedive of Egypt is making efforts to build up a large library in Cairo, and he has already acquired a very valuable collection of manuscripts of the Koran, among which is said to be the oldest copy known. Hopes were entertained by scholars that the opening of Khiva by the Russians in 1873 would furnish traces of the famous library of Samarcand, founded by Tamerlane and enlarged by his successors, but the result did not justify the expectations. Of the libraries of China and Japan but little is known, but there is said to be one containing 300,000 volumes in Peking, and one of 150,000 volumes in Tokio (Yedo), the latter being particularly rich in Chinese literature.—The libraries of the United States, public and private, numbered in 1860, according to the census of that year, 27,730, and contained in the aggregate 13,316,379 volumes. The census of 1870 shows a remarkable increase, the number of libraries having reached 164,815, and the total number of volumes 45,528,938. Of these libraries, 108,800 were private, containing in the aggregate 26,072,420 volumes, and 56,015 public, with 19,456,518 volumes. The public libraries are classed as follows: United States congressional, 190,000 volumes; United States departmental, 115,185; state and territorial, 653,915; town, city, &c., 1,237,430; court and law, 426,782; university, college, and school, 3,598,537; Sunday school, 8,346,153; church, 1,634,915; historical, literary, and scientific societies, 590,002; charitable and penal institutions, 13,890; benevolent and secret associations, 114,581; circulating, 2,536,128. According to the report of the United States commissioner of education for the year 1872, there were 1,080 public libraries in the United States, each containing 1,000 volumes and upward. Of these, 150 had from 10,000 to 25,000 volumes each, 37 from 25,000 to 50,000 each, and 15 more than 50,000. The following table shows the condition of the most important libraries of the United States in 1874:

PUBLIC LIBRARIES IN THE UNITED STATES  
CONTAINING 25,000 VOLUMES OR MORE.

PLACE.	Name.	When founded.	No. of volumes.	Rate of annual increase.
Angusta, Me.....	State .....	1827	25,000	....
Brunswick, Me.....	Bowdoin college.....	1809	85,000	150
Hanover, N. H.....	Dartmouth college.....	1770	50,000	1,000
Amherst, Mass.....	Amherst college.....	1827	29,000	800
Andover, ".....	Theological semin'y.....	1807	32,800	600
Boston, ".....	Athenæum.....	1807	108,000	....
".....	Public .....	1852	260,500	15,000
".....	State .....	1826	85,000	1,200
Cambridge, Mass..	Harvard university.....	1638	200,000	....
New Bedford, ".....	Public.....	1852	90,000	1,500
Salem, ".....	Essex Institute.....	1768	30,000	....
Springfield, ".....	City .....	1861	36,000	2,000
".....	Museum of natural history.....	....	25,000	....
Worcester, ".....	Antiquarian society.....	1812	55,000	1,500
".....	Public .....	1859	38,500	3,100
Providence, R. I..	Brown university.....	1763	42,000	....
".....	Athenæum .....	1836	34,500	800
Hartford, Conn....	Watkinson and Connecticut hist. soc.....	1858	44,500	....
".....	Young men's institute .....	1838	26,000	1,200
Middletown, Conn.	Wesleyan university.....	1811	25,500	1,700
New Haven, ".....	Yale university.....	1700	100,000	....
Albany, N. Y.....	State, general.....	1818	67,500	....
".....	law .....	....	25,500	....
Brooklyn, ".....	Long Island historical society .....	1868	26,500	2,350
".....	Mercantile .....	1857	45,000	3,500
Buffalo, ".....	Young men's association.....	1835	27,500	2,000
".....	Cornell university.....	1863	40,000	2,000
Ithaca, ".....	Apprentices' .....	1820	50,000	2,500
New York, N. Y..	Astor .....	1848	145,000	3,500
".....	Columbia college.....	1754	25,000	1,000
".....	Eclectic .....	1869	30,000	....
".....	Historical society.....	1804	40,000	....
".....	Mercantile .....	1820	145,000	4,500
".....	Society .....	1700	64,000	....
".....	Union theological seminary.....	1836	82,500	500
West Point, ".....	U. S. military acad'y.....	1815	25,000	700
Princeton, N. J..	Col'je of New Jersey.....	1748	28,500	....
".....	Theological semin'y.....	1812	25,000	....
Carlisle, Pa.....	Dickinson college.....	1753	81,000	....
Harrisburg, Pa.....	State .....	1816	30,000	....
Philadelphia, ".....	Academy of natural sciences .....	1812	25,600	400
".....	Brotherhood .....	1860	26,000	2,500
".....	Library company.....	1781	101,000	....
".....	Mercantile .....	1821	105,000	12,000
".....	University of Pa.....	1729	25,000	....
Annapolis, Md.....	State .....	1827	40,000	....
Baltimore, ".....	Mercantile .....	1839	27,300	....
".....	Peabody institute.....	1857	56,000	3,500
Georgetown, D. C.	Georgetown college.....	1789	31,000	800
Washington, ".....	Congress.....	1802	261,000	12,000
".....	Surgeon general's office .....	1865	38,000	2,500
".....	Patent office.....	1840	25,000	....
Richmond, Va.....	State .....	1822	30,000	1,500
Charlottesville, Va.	Un'v'y of Virginia.....	1825	36,000	400
Columbia, S. C....	University of South Carolina.....	1805	30,000	800
New Orleans, La.....	State.....	....	26,000	....
Cincinnati, Ohio..	Public.....	1867	62,000	5,000
".....	Mercantile .....	1835	35,500	1,200
Columbus, ".....	State .....	1817	39,000	1,200
Marietta, ".....	Marietta college.....	1835	26,000	....
Louisville, Ky.....	Public.....	1871	60,000	....
Ann Arbor, Mich..	Un'v'y of Michigan.....	1841	30,000	....
Detroit, Mich.....	Public.....	1865	25,000	1,900
Lansing, ".....	State .....	....	40,000	....
Madison, Wis.....	State historical society .....	1849	23,000	....
Chicago, Ill.....	Public.....	1874	40,000	15,000
Evanston, Ill.....	Northwestern university .....	1857	26,000	400
St. Louis, Mo.....	Public school .....	1865	36,000	5,000
".....	Mercantile .....	1846	42,000	1,300
".....	St. Louis university.....	1829	25,000	300
Sacramento, Cal..	State .....	1853	34,000	1,600
San Francisco, Cal.	Mercantile .....	1853	85,000	3,000
".....	Odd Fellows' .....	1854	26,000	2,500

These figures, which include bound volumes only, do not fairly represent the value of the libraries of the United States, as most of them contain in addition many thousands of unbound pamphlets. The public library of Boston, for example, has more than 100,000 pamphlets and unbound serials, the antiquarian society of Worcester 70,000, the library of congress 50,000, &c. If these were counted as they would be under the English law, which defines the term book to include "every volume, part or division of a volume, pamphlet, sheet of letterpress, sheet of music, map, chart, or plan separately published," many of our libraries could be stated to contain several thousand volumes more. The same or a similar rule is followed also in many of the European continental libraries, which will account partly for their rapid increase in the last decade. The number of volumes in college libraries in the above table represents all the collections, legal, theological, medical, &c., under the government of the several institutions.

## LIBRARIAN. See MOON.

**LIBRI-CARRUCCI DELLA SOMMAIA, Guillaume Brutus Ielle Timoléon**, count, a French mathematician, born in Florence, Jan. 2, 1803, died at Fiesole, near Florence, Sept. 28, 1869. He became professor of mathematics at the university of Pisa, but, having been compromised by his political views, fled in 1830 to France. Being naturalized as a Frenchman (Jan. 2, 1833), he was called to the academy of sciences as successor of Legendre, became inspector general of public instruction, and inspector general of the libraries of France, an office created expressly for him. Several works were published by him during this period, among which were *Histoire des sciences mathématiques en Italie depuis la renaissance jusqu'à la fin du 17<sup>e</sup> siècle* (Paris, 1838-'41; 2d ed., Halle, 1865); *Souvenirs de la jeunesse de Napoléon* (1842); and *Lettres sur le clergé et la liberté de l'enseignement* (1844); besides many memoirs, articles in magazines, and bibliographical labors in the form of annotated catalogues. During the latter part of the reign of Louis Philippe he was accused of purloining the most precious books and manuscripts from the libraries of Grenoble, Montpellier, Troyes, Poitiers, and Albi, as well as from the Mazarin collection and that of the arsenal. A report on this subject by M. Bouchy estimated his literary thefts from 1842 to 1847 at more than 500,000 francs. Libri, who had escaped to London, was found guilty and condemned (June 22, 1850) to ten years' imprisonment and degradation from public employment. In England, where he long resided, he was believed to be innocent. He left unfinished a life of Galileo.

**LIBURNIA**, in ancient geography, a mountainous district of Illyricum along the coast of the Adriatic, now included partly in Croatia and partly in Dalmatia. The inhabitants, who maintained themselves chiefly by navigation, occupied the northern islands of the



Adriatic, and had settlements on the Italian coast. They were a piratical race, and used fast-sailing vessels with one large lateen sail, which, adopted by the Romans in the struggle with Carthage, gradually supplanted the high-bulwarked galleys and became known as *naves Liburnæ* or simply *Liburnæ*. The Liburnians were the first of the Illyrians to submit to Rome.

**LIBYA**, the name given by the ancient geographers to Africa, or that portion lying between Egypt and the Atlantic. It was also the name of a district between Egypt and Marmarica, which, in contradistinction to the former, was often designated as Libya Exterior. (See LIBYANS.)

**LIBYAN DESERT**, that part of the Sahara or Great Desert which lies E. of Fezzan and the country of the Tibboos. It is about 1,000 m. in length from Tripoli to Darfoor and Waday, and from 500 to 600 m. in width, its E. border being Egypt and Nubia. Unlike the W. division of the Sahara, the Libyan desert contains a number of oases or fertile tracts which support a moderate population, and nearly all of them are overspread with extensive groves of date trees and fields in which durra is grown. Generally, however, the surface consists of vast level sandy plains or gravelly deserts extending E. and W., separated by low rocky ridges, or shelving down in a series of terraces toward the Mediterranean.—Portions of the Libyan desert have recently been explored by the German traveller Gerhard Rohlfs. (See ROHLFS.) See also Bayle St. John's "Adventures in the Libyan Desert" (1849).

**LIBYANS**, a group of peoples of N. Africa, linguistically related to the Egyptians and Ethiopians, and like them forming a family of the Hamitic division of the Semitic race in the wider sense. To them belong the Imosharh or Amazirgh, who are commonly known as Tuariks and Berbers. They are a mixed people, who divide themselves into Jhaggars, or the free, and Imrhads, the subjected, or vassals, the latter being evidently conquered tribes who adopted the language and customs of the Berbers. The Imosharh are an extensive nomad people, who inhabit the whole of northern Africa, and especially the oases between the Arab states of the north and the negro territories of the interior. They form numerous independent tribes bearing distinct names. Those occupying the mountainous district between Algiers and Tunis are known as Kabyles, and the inhabitants of the mountains of southern Morocco as Shelloohs or Shulluhs. The Imosharh speak the Ta-Mashek (*Ta-Masëq*) language, of which the characteristic peculiarities will be given under SEMITIC RACE AND LANGUAGES. Several eminent students of the African languages consider it akin to the Houssa language, and accordingly include the Houssa race in the Libyan group. Others, however, deny that this language possesses any of the elements characteristic of the Hamitic or Dyssemitic tongues. The Houssa language is

widely spoken in N. W. Africa, principally in the Houssa states Katsena, Saria, Kano, and others, as far N. as Damerghu and Air, and as a commercial language as far S. and W. as Yoruba and Borgoo on the right shore of the Niger.—Recent researches have identified the names of places, rivers, and mountains spoken of by the ancients and inscribed on Egyptian monuments as those of the Libyans, with the names applied to them in the Ta-Mashek language, which renders it to a high degree probable that the modern Berbers are the direct descendants of the ancient Libyans. They were a highly civilized people, and powerful both by sea and by land, occupying in remote times the entire coast of N. Africa, with the exception of the delta of the Nile. Lepsius and other Egyptologists suppose that the Libyans were the original inhabitants of the territory of the Egyptians, and that these drove them out of N. E. Africa on their immigration from Asia. The Libyans were probably one of the earliest maritime nations of the Mediterranean, and were formidable enemies of Egypt. It seems that the fleet of Thothes III., about 1600 B. C., succeeded in breaking their power on the sea; but they continued their incursions into Egypt by land, and the monuments of Seti I., about 1450 B. C., and of Rameses II., about 1400, tell of the terrible devastations which they caused. About this time the Pelasgic nations on the northern coasts of the Mediterranean had developed also into great seafaring peoples. The Libyans entered into a confederation with them and regained their naval power, and in the reign of Merneptah, during the 14th century B. C., being joined by the Tyrrhenians and Achæans, they invaded and nearly conquered Lower Egypt, under their king Maurmuu, son of Batta. Their progress was stopped near Paari in central Egypt, where they were completely defeated, and they retreated after having covered a great part of Egypt with ruins. The tradition recorded by Sallust, that at some early period Medes, Persians, and Armenians, commanded by Hercules, arrived on the N. coast of Africa, has led to the supposition that there was originally a distinction between Japhetic and Hamitic Libyans. Canaanitish colonies were established in Africa proper (the regions S. of Cape Bon), and in time was formed the Libyo-Phœnician nation. After the foundation of Carthage by the Phœnicians, and of Cyrene and other states by the Greeks, the Libyans, unable to resist their gradual expansion, were compelled to move inland. They had grown feeble, and when they called on Egypt to assist them against the Cyrenæans, about 570 B. C., they were defeated, and their subjection was only confirmed. The rapid rise of the Carthaginian, Greek, and Roman empires soon deprived the Libyans of all historical importance.

**LIBYAN SEA**, the name given by ancient geographers to that part of the Mediterranean

washing the shores of N. Africa, from the E. coast of the Roman province of Africa (the territory of Carthage, or Africa proper) to the S. coast of Crete and the frontier of Egypt. The two Syrtes belonged to it.

**LICATA**, or *Alicata*, a seaport of Sicily, in the province and 26 m. S. E. of the city of Girgenti; pop. about 17,000. It is at the mouth of the Salso, the largest river of Sicily, and is built partly on the shore of a small peninsula and partly on the slope of a rugged hill which is crowned by an ancient fortress, the castle of Sant' Angelo standing on the opposite height. The town is in a dilapidated condition. The harbor is so shallow that large vessels have to anchor a mile from the shore; still it has a large trade in grain, fruits, wines, macaroni, soda, and sulphur. There are four churches, containing several ancient paintings and inscriptions.—Licata probably occupies the site of Phintias, which was built by the tyrant of that name about 280 B. C. (See *GELA*.) The height had been previously fortified, and the castle of Sant' Angelo is supposed to stand on the spot where Phalaris kept the brazen bull. In the middle ages Licata was frequently plundered by the corsairs, and in 1553 it was fired by a French and Turkish fleet and almost entirely destroyed.

**LICENSE**, in law, may be simply and well defined as a permission. Thus, a permission to go upon the land or enter the house of him who gives it, the permission accorded by a belligerent power to its own subjects or to those of the enemy to carry on a trade interdicted by war, and the permission granted by a state to its citizens to sell certain wares or exercise certain callings, are familiar examples of licenses. The most common and important of these are licenses to keep a tavern, to sell spirituous liquor, to peddle out goods, to sell by auction, and the like. All of these are governed and regulated exclusively by statutes in the different states. In each state, the amount paid by way of tax for the license, if any, the privileges conferred by it, and the precautions against abuse, are determined only by the judgment of the legislature, in reference to the wants or peculiar circumstances of its people. It is universally admitted that each state has full power to enact general police regulations for the preservation of the public health and morals, and for this purpose it may require persons proposing to follow particular occupations, where abuses are liable to creep in, to obtain a license from the proper public authority. When, however, a license fee is imposed for the purpose of regulation merely, it should not exceed in amount the cost of the license and of a proper proportion of the expense of enforcing the law; but a license fee may also be imposed for the purposes of revenue, and then it is a tax, and can only be limited by the needs of government and the legislative discretion. For shipping licenses, see *SHIPPING*.—A mere and proper license to do anything

upon or with one's property transfers no interest and vests no right. It simply authorizes, or so to speak pardons, an unlawful act. Being a mere permission, it is evident that a license cannot permit anything which the licensor himself cannot do; so that if one permits another simply to go upon his land, the alienation of the land will necessarily extinguish the privilege. Further, it is clear that the benefit of a license is limited to him who receives it; for as the license transfers no property or interest, the licensee has nothing to assign. Finally, it is characteristic of a license that it rests wholly in the indulgence and will of the licensor, and is revocable at his pleasure. These are the incidents of every mere license; but if the license be supported by the grant of an interest, or be necessary to the enjoyment of a right, it attaches inseparably to it, and partakes of its incidents. It may not only cease to be revocable, but may become capable of assignment. Thus, to borrow a familiar illustration, a permission to hunt in a park, and to carry away the deer killed, is a license so far as it concerns the mere privilege of hunting; but it includes also a grant of the deer. If in such a case the grant of the property be well made, the license is irrevocable. So if one make a sale or gift of a chattel which is situated on his land or in his shop, the license to remove, though not express, but implied in such a case by law, is yet irrevocable, because the licensee has an interest in the chattel which can only be enjoyed by taking it away. The enjoyment of a mere parol license cannot be pushed so far as to create an easement; for such a continuing interest in lands can be legally raised only by deed, that is, by a formal instrument under seal. So that when one licenses another, by a mere parol permission, to keep hay stacks on his land, or allows the licensee to dig a ditch across it, the privilege in both cases is equally revocable even though it have been executed by the licensee. An easement would have been irrevocable, but that could have been created only by deed. But let it be supposed that one has, with another's permission, erected a building on the land of the latter; a revocation of the license in such a case would cause the licensee material injury, and in extreme cases a court of equity will sometimes interpose for the protection of the licensee. Courts of law have generally adhered to the strict law doctrines; and, in respect to permanent structures, though there are some decisions which regard the license as coextensive with the duration of the building to which it relates, yet the weight of authority is adverse to this view, and in favor of limiting the licensee's privilege to a right of entry and removal, as in the case of ordinary chattels. The more favorable decisions rest on the doctrine of equitable estoppel, which has been borrowed from the chancery practice, and now forms a means of remedying by common law many wrongs which otherwise would not fall within

the range of the common law jurisdiction. The general rule then, in the United States as well as in England, respecting licenses which concern the enjoyment of interests in lands, maintains their revocability, no matter what may have been done in reliance upon them; and no matter whether the question arise between the original parties, or be complicated by conveyance to third persons.—In international law, licenses are permissions to carry on a trade interdicted during war. The power to grant them rests naturally with the sovereign; but in time of actual hostilities they may be immediately issued by generals or other high military or naval officers. These licenses are liberally construed, but no advantage must be taken of the indulgence which they grant; as for example, by carrying a different kind of goods from that expressly permitted, or by changing, without the consent of the granting power, the person by whom the license was to be used; for, if it be not expressly transferable, the license is personal only.—In American constitutional law questions of conflict between state and federal authority sometimes arise in regard to licenses, but they are not often difficult of solution. Thus, it is clear that a license granted by federal authority, within the sphere of congressional power, must be paramount to any state law or state regulation; while, on the other hand, a state license to do what would conflict with any federal authority must be void. This subject received thorough examination in the case of *Gibbons v. Ogden*, 9 Wheaton's Reports, 1, in which a law of New York giving exclusive privileges in the public waters of that state was held void as conflicting with the power of congress over commerce. But when a license fee is imposed by federal authority for revenue purposes only, being but a tax, it interferes with nothing allowed or prohibited under state laws. Thus, liquor dealers are now required to pay a federal license tax; but this does not license the sale of liquors in any state where it is forbidden, or relieve from any state requirement of license or other state regulation. It gives no permission to carry on the business, but taxes it if carried on. (License Tax Cases, 5 Wallace, 462.)

**LICHENS.** In the classification of plants we have the two great sub-kingdoms of flowering and flowerless plants; the flowerless or cryptogamous plants are subdivided into acrogens, which are mostly herbaceous, with a distinct axis of growth, having foliaceous appendages and growing from the apex, and thallogens, which are seldom herbaceous or with foliaceous appendages, the growth taking place periphically or horizontally. To the thallogens belong the algæ, the fungi, and the lichens. These orders are usually readily distinguished. But there are some lichens which approach algæ, and others so near fungi as to make their classification difficult without careful study. The vegetative portion of a lichen is the *thallus*,

which may be regarded as the plant proper, as it performs all the functions of root, stem,

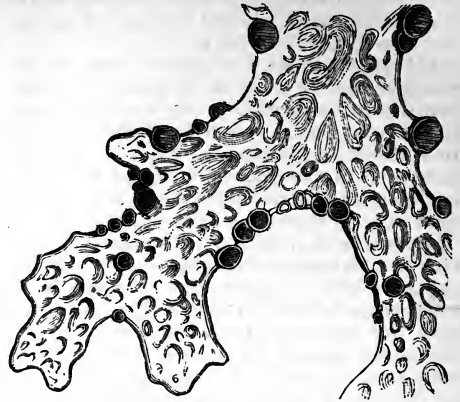


FIG. 1.—Tree Lungwort (*Sticta pulmonacea*).

and leaves; it is exceedingly variable in form, texture, and color. When the thallus forms a flat expansion it is called foliaceous, as in *sticta* (fig. 1); if erect and cylindrical, as in *cladonia* (fig. 2), it is fruticulose; in some it forms a mere crust on the soil or other surface, when it is called crustaceous; and when concealed beneath the bark of trees, it is hypophleous.

Whatever the form of the thallus, it consists wholly of cellular tissue, and its surface is destitute of stomata. (See LEAF.) The structure of the thallus is not homogeneous, but



FIG. 2.—*Cladonia coccinea*.

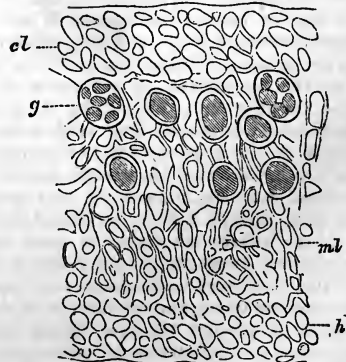


FIG. 3.—Microscopic View of Transverse Section of the Thallus of a Lichen. *cl*, the cortical layer; *g*, gonidia; *m*, medullary layer; *h*, the lower layer or hypothallus.

the microscope shows several distinct layers. A magnified cross section, as given in fig. 3,

presents first a layer of cells of colorless cellular tissue, the cortical layer (*c l*). Beneath this is the gonidial layer, made up of opaque cells, not altogether continuous, called *gonidia* (*g*); these are usually bright green or olive-green, and their presence is characteristic of lichens, serving to distinguish them from fungi. Next below the gonidia is the medullary layer (*m l*), consisting of elongated cells, which are either (1) felted or interlaced to form a loose web, (2) crustaceous, when the filaments are fewer, accompanied by white granules and crystals of oxalate of lime, or (3) cellular, when rounded or angular utricles are associated with the filaments. The lower layer of the thallus, called the *hypothallus* (*h*), is of cells or filaments, and is usually darker than the upper surface; it sometimes gives off root-like hairs (rhizines) which serve to attach the lichen to its matrix. Various modifications of this structure are met with; in some the cortical and in others the lower layer is wanting; in the erect lichens the medullary layer serves as an axis around which the gonidia are arranged, and in some of the crustaceous lichens it is difficult to distinguish any other elements

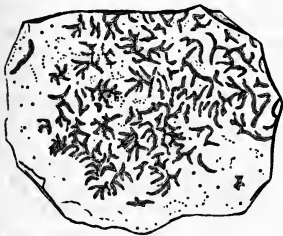


FIG. 4.—*Graphis elegans*.

than the gonidia.—The organs of fructification, called *apothecia*, are sometimes concealed within the tissues of the thallus, but are commonly upon its surface or margin, where they appear as variously shaped disks, to the different forms of which the descriptive names of peltate, scutellate, &c., are given; sometimes, as in what are called the "written" lichens, *graphis* (fig. 4), for example, the apothecia are elongated or branching irregular spots, which have been compared to Japanese letters; similar lichens of related genera are quite common on the bark of oak and other forest trees. Apothecia are rarely of the same color as the thallus, and are black, brown, yellow, or red of various shades. A general idea of the structure of an apothecium may be had from fig. 5, showing a magnified section. The microscope shows a number of oblong or club-shaped bodies, the spore cases (*s c*) or *asci*, to which all other parts of the apothecium are subordinate; these spore cases (also called *thecæ* and *sporangia*) are surrounded by numerous filaments, the *paraphyses* (*par*); the exterior of the apothecium has a cortical layer (*c l*), below which are gonidia (*g*), as in the thallus. Other apothecia vary in form and details from the one figured, but their office is the same, the protection and development of the spore cases, which contain the spores. Though lichens multiply by other methods,

that by spores is regarded as the normal one, corresponding to the reproduction of flowering plants by seeds, while the other ways in which they are multiplied are equivalent to propagating by means of cuttings, &c. The common

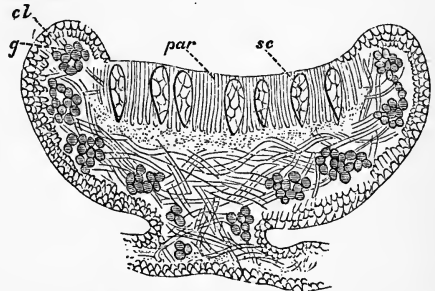


FIG. 5.—Microscopic View of the Cross Section of an Apothecium. *s c*, spore cases; *par*, the filaments or paraphyses accompanying them; *c l*, cortical layer; *g*, gonidia.

number of spores in each spore case is eight, but there are in some species six, four, or two, and even a solitary spore; on the other hand, they are (rarely) more numerous, up to 100 or more. The spores vary greatly in size, being from  $\frac{27}{1000}$  to  $\frac{157}{1000}$  of an inch in length; in form they vary from globose to needle-shaped, and in color from brownish yellow to nearly black. Some spore cases with their paraphyses are shown in fig. 6. One or more subdivisions are to be seen in the spores themselves, characters that are made use of in describing these plants; the color of the spores is very constant, and furnishes good distinguishing marks for genera and species. When the spores are perfected they are thrown out from the apothecium,



FIG. 6.—Spore Cases with paraphyses, highly magnified.



FIG. 7.—Microscopic View of the Cross Section of a Pycnidium.

either with or without the enclosing spore cases.—Many lichens bear upon the thallus

small black dots, either upon the margin only or scattered over its surface, called *spermatogonia*. A magnified cross section (fig. 7) shows a great number of needle-shaped, extremely minute bodies, the *spermatia*, which are borne by branched or simple filaments called *sterigmata*. The spermatia are present or absent in different species, and vary considerably in form, which is constant for each species in which they occur. Reasoning from analogy, the spermatia have been supposed to be equivalent to the antheridia in ferns and mosses, and to play the part of the male organ in fertilizing the spores; but as their action has not been observed, and they have not the locomotive power of the antheridia, their office is inferred rather than proven. *Pycnidia* are still other protuberances upon the surface of the thallus of some lichens; they are not of common occurrence, and their office is not well understood; as they contain spore-like bodies, they are regarded by Tulasne as supplementary means of propagation.—The close relationship of lichens with algae and fungi has already been alluded to; indeed, Schwendener goes so far as to deny to lichens the rank of a distinct order, but regards them as compound organisms consisting of algae held in captivity by the meshes of a fungus; a view which meets with but few adherents.—The essential elements of terrestrial vegetation are to be found in these plants, which hold such a subordinate rank in the scale of creation, being in fact rootless and cellular, subsisting upon the air, but furnished with stems, branches, and parts which correspond to fruits and seeds; their position in the vegetable kingdom being intermediate between the floating tribes of the algae and the fugacious forms of the fungi, or, as Fries expresses it, “having the vegetation of the algals and the fructification of the fungals.” Thus ingeniously contrived and admirably fitted for an especial office, we should expect to find them in situations suited to no other vegetation. Lichens play an important part in the economy of nature, and it is probable that they were the first forms of vegetation upon the dry rocks; and that by their decay and accompanying disintegration of the rocks they began the accumulation of soil. It is now well known that the pulverulent lichens are the first plants that clothe the bare rocks of newly formed islands in the midst of the ocean; the foliaceous lichens follow these, then mosses and liverworts, which by their decay prepare a soil for the growth of plants of the higher orders. The crustaceous lichens affect the very summits of mountains, growing near the limits of perpetual snow, and are seen very far north, so seemingly rudimentary as to appear like colored spots of the solid rocks. They are not, however, exclusively confined to such regions, being common in some instances on the margin of the sea in countries where granitic strata especially are to be found. The sides of buildings and the surfaces of sandstone rocks are favorite situations for many kinds. The

larger and more conspicuous are found in temperate and moist climates, choosing in the northern hemisphere northern and western exposures; and even at the equator there are species rich and gorgeous in colors. The prevailing tints in lichen are gray, white, black, dark brown, rich green, pale yellow, and orange red. From mere specks or patches of hard, seemingly inanimate matter, the lichens assume sizes of considerable magnitude. The change produced by moisture in the same plant is very striking: dull and inconspicuous in dry weather, it assumes bright colors in a prolonged season of dampness, and appears endowed with life. Lichens grow upon almost every substance where alternate dryness and moisture can be found, a very few only passing much of their existence in a submerged state. Destitute of roots and dependent upon the atmosphere for their nutrition, it seems to matter little with them upon what matrix they fix. Some have even been found attached to the glass in the windows of old and deserted buildings. In so wide a geographical range as that over which they are spread, the same identical species must be found occurring upon very distinct kinds of trees and soils, yet maintaining their specific characters. Thus there are some species which are most commonly to be expected upon rocks, yet which frequently grow upon the bark of trees. Many species are excessively polymorphous, and present themselves under so many varieties as to render it difficult to reduce them to an original type, the color of the thallus being often affected by the chemical composition of the rock on which they grow, or the color of the disk of the apothecia remarkably diverse. Several species are parasitical upon others, occurring upon their thalli in the reduced forms of mere fruits or of spermatogonia; their own vegetative functions being supplied by the subject to which they have attached themselves.—The value of the lichens to man may be estimated from their uses as articles of food and of medicine, and from their employment in the arts. According to Linnæus, in the arctic regions of Lapland the reindeer lichen (*cladonia rangiferina*) grows in the utmost profusion, and overspreads plains hundreds of miles in extent. These are the fertile fields of the Laplanders, so that the possessor of such a barren tract thus covered with lichens considers himself fortunate; for when the cold of winter has withered up every sort of herbage, this lichen becomes the principal aliment of the herds in which consists his wealth, and on which depends the very existence of the natives of that country. The reindeer lichen was at one time by edict of Gustavus III. of Sweden used in the manufacture of flour, when grain was scarce. It also grows in this country as far south as Pennsylvania, and is especially abundant northward to Canada and arctic America. The Iceland moss (*cestraria Islandica*) fattens cattle, sheep, deer, and swine; and out of this and of the *C.*



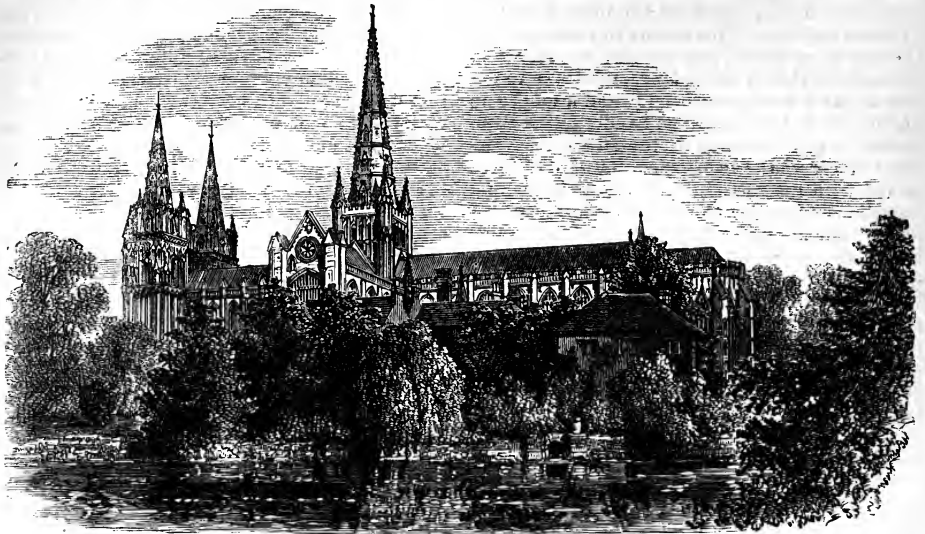
*nivalis* the Icelanders make soup and even bread. According to Olafsen, one ton of Iceland moss is equal to half a ton of meal. (See ICELAND MOSS.) *Lecanora esculenta*, of the steppes of Asia, is eaten by the nomadic tribes of those regions. This occurs in masses about the size of a filbert, and so like the stones in appearance that it needs a practised eye to detect it; as it has never been found attached to any object, it is regarded as having fallen from heaven, like the manna of the Israelites. The *tripe de roche* (*umbilicaria Muhlenbergii*), mixed with the roe of fishes, assists in making nutritious food for the North American Indians. Sir John Franklin was indebted to this lichen for subsistence after a four days' abstinence when on his journey to the shores of the polar sea. Lichens afford valuable materials for dyeing, of which the pabelle (*lecanora parella*) and cudbear (*L. tartarea*) may be cited as familiar instances. To these may be added *urceolaria scruposa* and *cinerea*, with *parmelia saxatilis*, *omphalodes*, *conspersa*, &c. *Rocella tinctoria*, *fuciformis*, *intricata*, &c., inhabitants of the shores of the Mediterranean or of the coast of Africa, Chili, &c., yield archil. Even the common yellow wall lichen (*parmelia parietina*), so abundant near our sea-coasts, possesses a peculiar principle called parietine (Thompson), which forms a bright yellow coloring matter; this is heightened by nitric, sulphuric, or muriatic acid, and alkalies change it to a rich purplish red.—The chemical constituents of lichens are phosphate of lime, salt, manganese, iron; several principles, as picrolichine, variolarine, orceine, cetrarine, inuline, erythrine, rocelline, picroerythrine; several acids, as parrellic, usnic, orceic, and erythrynic acid, and others; uncrystallizable sugar, oil, waxy matter, resinous matter; crystals, and oxalate of lime in the tissues especially of *lecanora tartarea*.—The name lichen was originally given by the ancient naturalists to certain species, because of a fancied resemblance to the cutaneous disease so called, whence they were supposed to be specifics for it.—The works of Acharius, though published early in the present century, are still employed by students in lichenology; his *Lichenographia Universalis* (Göttingen, 1810) and *Synopsis Methodica Lichenum* (Lund, 1814) are useful works of reference. Among other important European works upon the subject are Fries's *Lichenographia Europæa reformata* (Lund, 1831); Nylander's *Synopsis Methodica Lichenum* (Paris, 1858); and Tulasne's *Mémoire sur les lichens* (Paris, 1852). Berkeley's "Introduction to Cryptogamic Botany" (London, 1857) treats of the structure in this and the related families. The first enumeration of American lichens is to be found in Gronovius's *Flora Virginica* (1761); Muhlenberg's *Catalogus Plantarum* (Lancaster, Pa., 1813) enumerates 184 species; and several other works record American lichens. Halsey's "Synoptical View of the Lichens of New York" ap-

peared in the "Annals of the New York Lyceum of Natural History," 1823. Various papers upon lichens by Profs. Edward Tuckerman and J. Lewis Russell are to be found in the "Boston Journal of Natural History" (1838 *et seq.*). Prof. Tuckerman, now of Amherst college, who has devoted himself more thoroughly than any other American botanist to these obscure plants, besides the memoirs above referred to and others in Silliman's "Journal of Science and Arts" (1858-'9), has published an "Enumeration of North American Lichens" (Cambridge, 1845), and a "Synopsis of the Lichens of New England and of the Northern States and British America" (Cambridge, 1848). The same author's *Lichenes America Septentrionalis Exsiccati* (1848-'51) consists of six fascicles of specimens, and is an important contribution to American lichenology. In an enumeration of this author's labors we should not omit a memoir in Agassiz's "Lake Superior" (Boston, 1850), and one in the "Botany of Wilkes's Exploring Expedition," recently published. Since the publication of Prof. Tuckerman's earlier works much progress has been made in the study, and his promised work on the "Genera of North American Lichens" will no doubt embody whatever is now known of these obscure forms of vegetable life.

**LICHFIELD**, an episcopal city and municipal and parliamentary borough of Staffordshire, England, and a county in itself, situated on a small branch of the Trent, and on the London and Northwestern railway, 110 m. N. W. of London; pop. in 1871, 7,380. It is well paved and lighted, and amply supplied with water, and the principal streets are lined with handsome and well built houses. The most interesting public edifice is the cathedral, parts of which display the early English architecture. It is 410 ft. long, 153 ft. wide across the transepts, and has three spires, the central one of which is 280 ft. high. It was founded in the 7th century, but the present building dates from the 12th and 13th centuries. It occupies an elevated site, and is visible from a great distance. Its interior corresponds with the exterior in the magnificence of its architectural decorations. Among its numerous monuments are those of Dr. Samuel Johnson, Garrick, and Lady Mary Wortley Montagu, and Chantrey's celebrated group of the sleeping infants. The cathedral suffered much during the siege of the town by the parliamentary forces in 1643, but has since been twice thoroughly repaired. Other notable churches are St. Chad's, St. Mary's, and St. Michael's, the first of which is the most ancient in the city. There are also several national schools, a grammar school founded by Edward VI., a savings bank, a theatre, and a guildhall. On the W. side of the market place is the house in which Dr. Johnson was born, and in the same street is his statue in a sitting posture, 19 ft. high, on a pedestal ornamented with bass-reliefs illustrative of his life. The chief manufactures are paper,

linen, coaches, and harness; and there are large breweries. The carpet manufacture, formerly extensive here, has declined. The city was

incorporated by Edward II., and Queen Mary constituted it a separate county. The episcopal see was established about 670, and from



Lichfield Cathedral.

785 to the close of the century it was an archbishopric.

**LICHTENBERG, Georg Christoph**, a German physicist, born at Oberramstädt, near Darmstadt, July 1, 1742, died in Göttingen, Feb. 24, 1799. He was educated at Darmstadt and Göttingen, and appointed professor of mathematics at the university of the latter place in 1770, and subsequently of experimental philosophy. During two visits to England he studied the English character and literature, and acquired that stock of information which he afterward turned to account in his unfinished *Erklärung der Hogarthischen Kupferstiche* (Göttingen, 1794-'9). From 1778 till his death he was editor of the *Göttingischer Taschenkalender*, and in 1780 he began, in connection with Georg Forster, the *Göttingisches Magazin der Literatur und Wissenschaft*, which was discontinued in 1785. Among his other works are: *Ueber Physiognomik wider die Physiognomen* (1778), in which he ridiculed Lavater's science of physiognomy, and *Ueber die Pronunciation der Schöpsse des alten Griechenland* (1782), a satire on Voss's proposed modification of the spelling of words derived from the Greek. A complete edition of his works was published at Göttingen (9 vols. 8vo, 1800-'6, and 6 vols., 1844-'5).

**LICHTENSTEIN, Martin Heinrich Karl**, a German naturalist, born in Hamburg, Jan. 10, 1780, died on board the steamer between Korsör and Kiel, Sept. 3, 1857. He studied at Jena, graduated in 1802 as doctor of medicine at Helmstedt, and accompanied the Dutch gov-

ernor Janssens to the Cape of Good Hope. At the end of 1802 he made a tour of exploration in the interior of Cape Colony, and collected the materials for his scientific work, *Reisen im südlichen Afrika* (Berlin, 1810-'11; English translation by Anne Plumtre, London, 1812). In 1804, on the outbreak of the war with England, he served as surgeon in a regiment of Hottentots, and in 1805 was sent on a mission to some of the native tribes. In 1811 he became professor of zoölogy at the university of Berlin, and in 1813 director of the zoölogical museum. He wrote many zoölogical works.

**LICK, James**, an American philanthropist, born at Fredericksburg, Lebanon co., Pa., Aug. 25, 1796. He was engaged in commercial pursuits in South America from 1821 to 1847, when he went to California, invested largely in real estate, and employed his means in other enterprises, which resulted in the accumulation of a large fortune. In 1874 he assigned \$2,000,000 from his estate to trustees for various public and philanthropic purposes, including \$700,000 for a telescope and other apparatus for an observatory previously founded by him at Lake Tahoe; \$300,000 for a school of mechanical arts in California; \$250,000 for public monuments and \$150,000 for public baths in Sacramento; \$150,000 for a monument to Francis Scott Key, the author of "The Star-Spangled Banner;" and large sums to several benevolent societies in San Francisco, in which city he now (1874) resides.

**LICKING**, a central county of Ohio, drained by the Licking river; area, 666 sq. m.; pop. in

1870, 35,756. It has a level surface and a good soil, mostly under cultivation, and abounds in iron ore. It is intersected by the Ohio canal, and by the Pittsburgh, Cincinnati, and St. Louis railroad, and the Central Ohio and Lake Erie divisions of the Baltimore and Ohio. The chief productions in 1870 were 332,381 bushels of wheat, 1,556,341 of Indian corn, 359,617 of oats, 145,305 of potatoes, 1,061,513 lbs. of wool, 858,152 of butter, and 49,995 tons of hay. There were 9,993 horses, 8,319 milch cows, 14,898 other cattle, 220,963 sheep, and 31,103 swine; 26 manufactories of carriages, 2 of brick, 1 of rectified coal oil, 6 of iron castings, 2 of engines and boilers, 12 of saddlery and harness, 1 of sash, doors, and blinds, 6 of tin, copper, and sheet-iron ware, 1 of woollen goods, 13 tanneries, 9 currying establishments, 1 distillery, 3 breweries, 3 flour mills, 1 planing mill, and 10 saw mills. Capital, Newark.

**LICKING.** I. A river of Kentucky, rising in Floyd co. among the Cumberland mountains, and, after a N. W. course of more than 200 m., falling into the Ohio at Newport, opposite Cincinnati. It is navigable for small steamers to Falmouth, about 50 m. from its mouth. II. A river of Ohio, called the Pataskala by the Indians, rising near the centre of the state, and, after a winding S. E. course of about 75 m., falling into the Muskingum at Zanesville. It furnishes valuable water power.

**LICTORS,** in Roman antiquity, public officers appointed to attend on the chief magistrates, to clear the way and to enforce proper respect. At first they were freemen of the plebeian order, but in later times the office could be held by freedmen. No slave was ever appointed a lictor. The ancient kings were always preceded by 12 lictors, who bore the *fascēs* and *secures*. One of the consuls was preceded by the same number, bearing only the *fascēs*. Dictators had a double number. Lictors also waited on the decemviri, prætors, and proconsuls, and on some minor magistrates when in the provinces. It belonged to them to inflict punishment on condemned Roman citizens.

**LIDDELL, Henry George,** an English scholar, born about 1811. He graduated at Christchurch college, Oxford, in 1833, took holy orders, and after holding various posts in that college became successively proctor of the university, head master of Westminster school, domestic chaplain to Prince Albert, and chaplain extraordinary to the queen. In 1855 he was appointed dean of Christchurch, and in 1870 vice chancellor of the university of Oxford. With R. Scott, M. A., he prepared a Greek lexicon (London, 1843; 6th enlarged ed., 1869; enlarged by Henry Drisler, New York, 1846). He has also published "History of Rome from the Earliest Times to the Establishment of the Empire" (2 vols., 1855).

**LIDDON, Henry Parry,** an English clergyman, born in 1830. He was educated at Christchurch, Oxford, and graduated in 1850. Having taken orders, he was vice principal of the

theological college of Cuddesdon from 1854 to 1859, became examining chaplain to the bishop of Salisbury, and in 1864 was made prebendary of Salisbury cathedral. In 1866 he was appointed Bampton lecturer, became canon residentiary in St. Paul's cathedral, London, in 1870, and the same year was appointed Ireland professor of exegesis in the university of Oxford. He is distinguished as one of the most eloquent preachers in the church of England, and has published "Lenten Sermons" (1858); "The Divinity of our Lord and Saviour Jesus Christ" (Bampton lectures, 1867); and "Some Words for God" (1871).

**LIEBER. I. Francis,** an American publicist, born in Berlin, March 18, 1800, died in New York, Oct. 2, 1872. He had begun the study of medicine when in 1815 he joined the Prussian army as a volunteer, fought in the battles of Ligny and Waterloo, and was severely wounded in the assault on Namur. He studied at the university of Jena, suffered persecution in 1819 as member of a *Burschenschaft*, and in 1821 proceeded to Greece to take part in its struggle for independence, travelling on foot through Switzerland to Marseilles. After enduring various privations, he returned to Italy, and passed the years 1822 and 1823 at Rome in the family of Niebuhr, then Prussian ambassador. He wrote while there a journal of his sojourn in Greece. Returning to Germany in 1824, he was imprisoned at Köpenick, where he wrote a collection of poems, which, on his release by the influence of Niebuhr, was printed at Berlin under the name of Franz Arnold. Annoyed by persecutions, he went to England in 1825, and supported himself for a year in London as a private teacher. In 1827 he came to the United States, and lectured on history and politics in the larger cities. While residing at Boston he undertook the editorship of the "Encyclopædia Americana," based upon Brockhaus's *Conversations-Lexikon*. It was published in Philadelphia in 13 volumes, between the years 1829 and 1833. He also made translations of a French work on the revolution of July, 1830, and of the life of Kaspar Hauser by Feuerbach. At New York in 1832 he translated the work of De Beaumont and De Tocqueville on the penitentiary system in the United States, adding an introduction and notes. On invitation of the trustees of Girard college he furnished a plan of education and instruction for that institution, which was published at Philadelphia in 1834. In the same year appeared his "Letters to a Gentleman in Germany, written after a Trip from Philadelphia to Niagara," and in 1835 his "Reminiscences of Niebuhr." In this year he was appointed professor of history and political economy in the South Carolina college at Columbia, and discharged the duties of this chair till 1856. In 1857 he was appointed to the same professorship at Columbia college in New York, and subsequently accepted the chair of political science in the

law school of the same institution. During this long period he published numerous important works, among which are: "A Manual of Political Ethics" (2 vols. 8vo, Boston, 1838), adopted by Harvard college as a text book, and commended by Kent and Story; "Legal and Political Hermeneutics, or Principles of Interpretation and Construction in Law and Politics" (1838); "Laws of Property: Essays on Property and Labor" (18mo, New York, 1842); and "Civil Liberty and Self-Government" (2 vols. 12mo, Philadelphia, 1853; new ed., 1874). Special branches of polity or civil administration also engaged his attention, particularly the subject of penal legislation, among his writings on which are: "Essays on Subjects of Penal Law and the Penitentiary System," published by the Philadelphia prison discipline society; an essay on the "Abuse of the Pardoning Power," republished by the legislature of New York; "Remarks on Mrs. Fry's Views of Solitary Confinement," published in England; and a "Letter on the Penitentiary System," published by the legislature of South Carolina. Among his occasional papers are a "Letter on Anglican and Gallican Liberty;" a paper on the vocal sounds of Laura Bridgman, the blind deaf mute, compared with the elements of phonetic language, published in the "Smithsonian Contributions to Knowledge;" and numerous addresses on anniversary and other occasions. He published his inaugural address as professor in Columbia college on "Individualism and Socialism or Communism," which he regarded as the two poles on which all human life turns; also his introductory discourse to a course of lectures on the state in the college law school, entitled "The Ancient and the Modern Teacher of Politics." In 1863 he was one of the founders of the loyal publication society, of which he served as president. More than 100 pamphlets were published under his supervision, of which 10 were by himself. His "Guerrilla Parties considered with Reference to the Law and Usages of War" (1862), written at the request of Gen. Halleck, was often quoted in Europe in the discussions evoked by the Franco-German war; and his "Instructions for the Government of the Armies of the United States in the Field" (1863) was ordered by President Lincoln to be promulgated in the general orders of the war department. In 1867 he published "Reflections on the Changes Necessary in the Present Constitution of the State of New York," "Memorial relative to Verdicts of Jurors," and "The Unanimity of Juries;" and in 1868 "International Copyright" and "Fragments of Political Science on Nationalism and Internationalism." As regards the exterior relations of political economy, he believed in free trade, and his pamphlet, "Notes on Fallacies of American Protectionists," was published in this country and in England. In 1865 he was appointed superintendent of a bureau at Washington for the preservation of the records of

the confederate government, and in 1870 he was chosen, by the united approval of the United States and Mexico, as final arbitrator in important cases pending between the two countries. This work was not completed at his death.—See "The Life, Character, and Writings of Francis Lieber," a lecture delivered before the historical society of Pennsylvania, by M. Russell Thayer (Philadelphia, 1873).  
**II. Oscar Montgomery**, son of the preceding, born in Boston, Sept. 8, 1830, died in Richmond, Va., June 27, 1862. He was educated in Berlin, Göttingen, and Freiberg. He was the author of "The Assayer's Guide," "The Analytical Chemist's Assistant," translated from the German of Wöhler (1852), *Der Itacolumit, seine Begleiter und die Metallführung desselben* (1860), and of various articles on mining in reference to this country in the New York "Mining Magazine." He was state geologist of Mississippi in 1850-'51; was engaged in the geological survey of Alabama in 1854-'5; and from 1856 to 1860 held the office of mineralogical, geological, and agricultural surveyor of South Carolina. His first annual report of the last mentioned survey was published in 1857, and the fourth and last in 1860. In 1860 he accompanied the "American Astronomical Expedition" to Labrador as geologist. He joined the confederate army at the outbreak of the civil war, and died of wounds received in the battle of Williamsburg.

**LIEBHARD, Joachim.** See CAMERARIUS.

**LIEBIG, Justus von**, baron, a German chemist, born in Darmstadt, May 12, 1803, died in Munich, April 18, 1873. While a youth he was taught in the gymnasium of his native town; and, after spending ten months in an apothecary's establishment, he entered in 1819 the university of Bonn. Afterward at Erlangen he obtained the degree of M. D. By the assistance of the grand duke of Hesse-Darmstadt he was enabled in 1822 to visit Paris, where he devoted two years to the study of chemistry. In 1824 he read a paper before the French institute on the chemical composition of fulminates, which attracted the attention of Humboldt, and by his influence Liebig was appointed adjunct professor of chemistry at Giessen. In 1826 he was made professor in the university, and soon established a laboratory for teaching practical chemistry, the first of the kind in Germany. It became a resort for students from different parts of the world, and especially from England, among whom are found the names of Lyon Playfair, Gregory, and Johnston. Hofmann, Will, and Fresenius were his assistants. In 1832 Liebig with Prof. Geiger of Heidelberg established the *Annalen der Pharmacie*, to which he continued to be a contributor till near the time of his death, and scarcely a volume of which up to 1862 does not contain some important paper by him. In 1838 he visited England, and at the meeting of the British association for the advancement of science read a paper on lithic acid, in which

he announced the discovery by Wöhler of the composition of urea and the method of making it artificially. The association requested him to draw up two reports, one on isomeric bodies, the other on organic chemistry. The response was made in 1840, in a work dedicated to the British association, entitled *Die organische Chemie in ihrer Anwendung auf Agricultur* (Brunswick, 1840), which was translated into English from the manuscript by Dr. Lyon Playfair, under the title "Chemistry in its Application to Agriculture and Physiology." In the preface Liebig states that his object in the work was "to develop, in a manner correspondent to the present state of science, the fundamental principles of chemistry in general, and the laws of organic chemistry in particular, in their applications to agriculture and physiology; to the causes of fermentation, decay, and putrefaction; to the vinous and acetic fermentations; and to nitrification. The conversion of woody fibre into wood and mineral coal, the nature of poisons, contagions, and miasms, and the causes of their action on the living organism, have been elucidated in their chemical relations." This work was soon followed by the *Chemische Briefe*, which was translated into English under the title "Familiar Letters on Chemistry and its Relations to Commerce, Physiology, and Agriculture." The effect of these letters in Germany, as stated by Liebig in his preface to the English edition of 1843, was "to lead to the establishment of new professorships in the universities of Göttingen and Würzburg for the express purpose of facilitating the application of chemical truths to the practical arts of life, and of following up the new line of investigation and research, the bearing of chemistry upon physiology, medicine, and agriculture, which may be said to be only just begun." In June, 1842, Liebig presented to the British association a second report in response to their request of 1838. This was entitled *Die Tierchemie oder organische Chemie in ihrer Anwendung auf Physiologie und Pathologie* (Brunswick, 1842). It was translated into English from the author's manuscript by Prof. William Gregory and published as "Animal Chemistry, or Chemistry in its Application to Physiology and Pathology." Great practical good resulted from Liebig's investigations, which soon led to a better appreciation of the nature and proper application of medicines and food. This particular subject continued to occupy his attention, and papers frequently appeared in the *Annalen* and other scientific journals presenting the results of further investigations. These were embodied in two works, *Chemische Untersuchungen über das Fleisch und seine Zübereitung zum Nahrungsmittel* (Leipsic, 1847), and *Die Ursachen der Säftebewegung im thierischen Organismus* (Brunswick, 1848), translated by Prof. Gregory, "Researches on the Chemistry of Food," and "The Motions of the Juices in the Animal Body." The nature of the ani-

mal tissues and of the liquid compounds of the body was fully investigated in these works, and the passage of their elements from one to another was carefully traced. The practical application is found in the observations upon the cooking of food, and the suggestions by which this process may be conducted with greater economy and more exact knowledge of the objects to be attained in the effect of the aliment upon the system. Liebig engaged with others in several publications besides those named. With Poggendorff he compiled the *Handwörterbuch der Chemie* (9 vols., Brunswick, 1837-'64), and he contributed to Geiger's *Handbuch der Pharmacie* (Heidelberg, 1839) the portion devoted to organic chemistry, which afterward appeared as a separate work. He also furnished in 1841 the organic portion of Dr. Turner's "Elements of Chemistry." In 1848 he established, in connection with Prof. Kopp, an annual report on the progress of chemistry, which, with the aid of others as contributors, has been continued to the present time. In 1855 appeared his *Grundsätze der Agriculturchemie*, in 1856 *Theorie und Praxis der Landwirthschaft*, and in 1859 *Naturwissenschaftliche Briefe über die moderne Landwirthschaft*, translations of which have been published in several languages. Liebig gave much attention to the subject of the utilization of the sewage of cities; and his letters setting forth the continual loss in fertilizing material which is experienced in all the great food-producing countries of the world, and which must be greatly augmented when the supplies of guano are exhausted, were read with no little interest by scientific and thoughtful men. The sewage of cities he regarded as the best source from which to restore this loss. Of late years his name has acquired a wide publicity in connection with his *extractum carnis* or "essence of meat." One of his favorite subjects was that of fermentation, and his explanation of the phenomena as being due to the action of a substance whose molecules are in a state of transition upon the fermenting body was long and ably maintained, and cannot be said to be yet superseded, although there is a general tendency to the adoption of the strictly germ theory of Pasteur. His last investigation on the subject was published in 1870, in which he ably upholds his theory against Pasteur's explanation, and his views and arguments are as forcibly and clearly expressed as we find them in his early publications. His last communication to the *Annalen* is a notice of the discovery of chloroform, published in March, 1872, in which he calls attention to the fact that it was discovered by himself in 1831, and not by Soubeiran, as is generally supposed in Europe.—The influence which Liebig exerted on the progress of discovery in chemistry is due to his high powers of generalization united to indomitable perseverance. As a critic he was unsparing and sometimes bitter, but paid the greatest respect to truth and candor. As an



author he was remarkable for the grace and lucidity of his style, among the best examples of which are his "Familiar Letters on Chemistry." He was an enthusiast in regard to America, where he had many more readers than in any other country, and is said to have entertained at one time the idea of making the United States his residence. Many honors were conferred upon him by learned societies, public institutions, and individuals. By Louis II., grand duke of Hesse-Darmstadt, he was made a baron in 1845. Professorships were offered him in England, and at Heidelberg, Vienna, and other places. But he remained at Giessen till 1852, when he accepted the professorship of chemistry at Munich and the presidency of the chemical laboratory. In 1860 he was appointed president of the academy of sciences of Munich, as successor of Thiersch; and in 1861 he was elected foreign associate of the French academy of sciences. His collected works were published in 1874 simultaneously at Leipsic and Heidelberg.

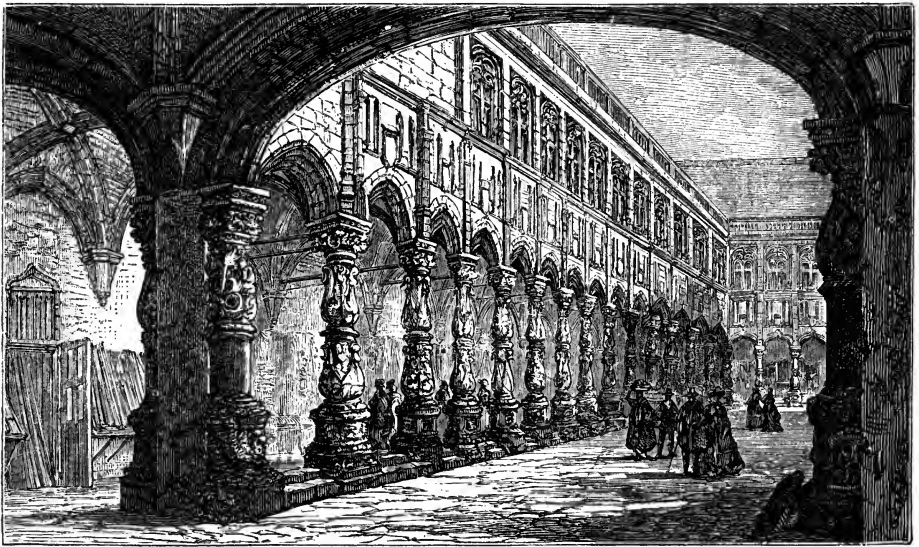
**LIECHTENSTEIN**, an independent principality, which until 1866 formed part of the German confederation, bounded N. E. and E. by the Austrian circle of Vorarlberg, S. by the Swiss canton of Grisons, and W. by the Rhine, which separates it from the canton of St. Gall; area, 62 sq. m.; pop. in 1867, 8,320. It has a mountainous surface, crossed by branches of the Alps, which however do not rise to any great height. The soil in most parts is fertile and well watered, producing flax, grain, wine, and fruit. Timber is abundant, and there is much excellent pasturage. Capital, Liechtenstein or Vaduz. The prince shares the legislative power with a diet consisting of 15 members, three of whom are appointed by him, the others being elected. The revenues amount to 60,000 florins, 16,000 being derived from the share in customs duties which by a treaty, renewed in 1864, is paid by Austria.—The prince of Liechtenstein belongs to the family of Este, one of the oldest in central Europe; and although his sovereignty is so small, his estates in Austria, Prussia, and Saxony, covering nearly 2,200 sq. m., with a population of more than 600,000, render him one of the richest proprietors in Germany, his income from them being 1,400,000 florins. The family of Liechtenstein was raised to the rank of sovereign princes in the 17th century. Several of them have distinguished themselves by their public services, especially as soldiers. JOHANN JOSEPH (1760–1836) took a conspicuous part in the campaigns on the Rhine and in Italy, and concluded in 1805 the treaty of Presburg. His son, Prince ALOYS, born May 26, 1796, died Nov. 12, 1858. He was succeeded by his son JOHANN II., born Oct. 5, 1840, who is sovereign prince of Liechtenstein, duke of Troppan and of Jägerndorf, &c. His cousin, Prince Aloys, married in 1872 Miss Mary Fox, the adopted daughter of the last Lord Holland. She has published "Holland House," an illus-

trated description of that edifice, with notices of its various residents (2 vols., London, 1874).

**LIEËGE** (Ger. *Lüttich*). I. A province (Flem. *Zwikerland*) of Belgium, bounded N. by Belgian and Dutch Limburg, E. by Rhenish Prussia, S. by Belgian Luxembourg, and S. W. and W. by Namur and Brabant; area, 1,119 sq. m.; pop. in 1871, 592,177, nearly all Walloons and Roman Catholics. The W. portion is a fertile plain, while the S. and E. parts, which are traversed by an offshoot of the Ardennes, are woody, rocky, and hilly. The principal rivers are the Meuse and the Ourthe. The province is rich in potatoes, in sheep and cattle, and in mines and mineral springs, of which those of Chaudfontaine and Spa are the most celebrated. The chief manufactures are cotton goods, cloth, straw hats, wooden, glass, steel, and iron ware, surgical instruments, machines, and firearms. The principal places are Liège, Verviers, Seraing, and Huy. II. A city (Flem. *Luik*), capital of the province, in the middle of a plain surrounded by mountains, at the junction of the Meuse and the Ourthe, 56 m. E. S. E. of Brussels and 23 m. W. S. W. of Aix-la-Chapelle; pop. in 1870, 106,442. The Meuse, which is here crossed by four bridges, separates Liège into the old or upper and the new or lower town. The streets, excepting in the new part of the town and in some of the ten suburbs, are steep and narrow. The houses, which have a smoky and dingy appearance, are generally so high as to exclude the sun and confine the air. There are however 11 public squares, and the quays along the river afford pleasant promenades. The city is defended on the N. W. by a large citadel built on Mt. St. Walburge, and on the S. E. by Fort Chartreuse. The church of St. Jacques is the most remarkable architectural monument, its magnificent interior containing some of the finest specimens of tracery and fretwork in the world. There are more than 20 Roman Catholic churches, and a place of worship for Protestants. The *palais de justice*, formerly the palace of the prince bishop, occupying one side of the Place St. Lambert, built in 1533, is of imposing appearance, with a portico of composite columns, each carved with a different pattern. Liège is rich in educational, charitable, literary, and artistic institutions. The University place is adorned by statues of the native composer Grétry and the geologist Dumont; it also contains a botanic garden and various public buildings, besides the university. The latter, founded by the king of Holland in 1817, is attended by about 500 students. Connected with it are a school of mining and a polytechnic school (*école des arts et manufactures*). There are also an academy of painting, a conservatory of music, a theological seminary, a royal gymnasium, an institution for the deaf and dumb, a chamber of commerce, and a commercial tribunal. Liège, from its extensive iron works, and from its situation in a district abounding with coal and

iron, has acquired the title of the Birmingham of Belgium. The neighboring village of Seraing is a focus of industry, iron furnaces, forges, and coal mines, the chief being the establishment formed by John Cockerill, an English engineer, and now conducted by a company. Glons, a village N. of Liège, is the centre of a great straw hat manufacture, employing more than 6,000 persons; and 3 m. from the town is Herstal, from which Pepin the Fat took his name D'Hérystal, and which is important for its steel works, coal mines, and iron foundries. The manufactures in and around the town include hardware, broadcloth, glass, leather, nails, steam engines, and all sorts of machinery, carriages, and linen and cotton goods. The manufacture of firearms, however, is that for which Liège and its environs are most celebrated. The royal cannon foundry

was established there in 1802.—A village named Legia or Leodium occupied the site of the town in the 7th century. At the beginning of the 8th it became the seat of a bishop, who in the 10th was raised to the rank of an independent sovereign prince by the German emperor. At the beginning of the 12th the chapter of St. Lambert cathedral in Liège was the noblest in Europe. In 1212 Henry I., duke of Brabant, captured the city and pillaged it for six successive days. The struggles of the Liégeois with their bishops and the dukes of Burgundy are described in Scott's "Quentin Durward." Charles the Bold, to protect the bishop Louis de Bourbon, inflicted severe punishment upon his mutinous subjects by abridging their privileges and demolishing all the fortifications. In 1468, the citizens having resumed their rebellious conduct, Charles con-



Court of the Palais de Justice, Liège.

demned the town to destruction, and all the buildings except churches and monasteries were burned and many of the inhabitants slaughtered. Louis de Bourbon was murdered in 1482 by William de la Marck, the "wild boar of the Ardennes," who wished to obtain the mitre for his son. But the audacity of the bishops was not easily to be subdued, and one of them declared war against Louis XIV., in consequence of which the town was taken by the French. Marshal Boufflers bombarded it for five days in 1691, and eventually abandoned it to the duke of Marlborough, who stormed the citadel, Oct. 23, 1702. The bishops were expelled on the outbreak of the French revolution in 1789, but reinstated by Austrian troops. In 1794 Liège was annexed to France, and was comprised in the department of Ourthe till 1814, when it was included in the new king-

dom of the Netherlands. In 1830 the Liégeois were the most enthusiastic in advocating the national independence of Belgium.

**LIEGNITZ**, a town of Prussia, capital of a district of the same name in the province of Silesia, on the Katszbach, and on the Silesian and Saxon railway, 37 m. W. N. W. of Breslau and 147 m. S. E. of Berlin; pop. in 1871, 23,124. It is an old but well built and handsome town, with five suburbs, and is surrounded by a boulevard planted with trees. It contains seven churches, a synagogue, the Ritter academy (a school for nobles), several hospitals, a public library, a gymnasium, industrial and other schools, and a deaf and dumb institution. The *Schloss* or castle, a part of which dates from the 15th century, is now a museum of art and industry. In the *Fürstencapelle* are the monuments of many of the dukes of

the Polish Piast family, who down to 1675 ruled the territory of Liegnitz. The manufactures include table linen, hosiery, hats, tobacco, &c. There are extensive vegetable gardens in the suburbs and surroundings.—Frederick the Great won here a victory over the

whom property is delivered, who receives the property for the purpose of improving its condition or adding to its value by putting his labor into the materials supplied him; as a tailor, who by this rule would have a lien on the cloths delivered him to make up into garments, for his wages or compensation for so doing; a watchmaker, employed to clean or repair a watch; a bookbinder on books bound by him; dyers on goods sent to them to be dyed, &c. It is by an extension of the same principle that an attorney has a lien on the papers in his hands, and on any judgment or money he may receive, for his demands against his client. For a similar reason, a banker has a general lien on the paper securities in his hands to cover his claims; and so has an insurance broker, and if the assured transferred his interest in the policy, the transferee would take it subject to the broker's lien. In all these cases it will be observed that the lien is nothing more than a right to retain possession of the property. This principle is important because it makes possession absolutely essential to the lien, and therefore the lien is lost if the creditor give up the possession; for the creditor is then supposed to waive and renounce the security he has upon the thing itself, and to trust only to his personal demand against the debtor. For an analogous reason, it is a general rule, that if one who has a lien to secure a debt receives from the debtor other and adequate security for the debt, he thereby waives and loses his lien on the goods; and if the creditor who thus loses his lien by giving



View in Liegnitz.

Austrians on Aug. 15, 1760. The neighboring field of Wahlstatt witnessed the great battle of April 9, 1241, against the Mongols, and that of Aug. 26, 1813, in which Blücher defeated the French (battle of the Katzbach). The title of princess of Liegnitz was conferred by Frederick William III. of Prussia upon the countess Anguste von Harrach, with whom he contracted a morganatic marriage in 1824.

**LIEN** (Fr. *lier*, to tie or bind), in its broader sense, every hold upon or right to property to secure the payment of a debt, or the discharge of an obligation. In this sense it includes mortgages, pledges, bottomries, and respondentia. All of these are liens created by contract; but in a narrower and more specific sense, it has been well defined as "a right in one man to retain that which is in his possession belonging to another till certain demands of the person in possession are satisfied." (Hammond v. Barclay, 2 East, 227.) Liens of this kind are seldom created by contract, but arise almost always by the operation of law upon the relation between the parties. The most common of these are the liens of a carrier, an innkeeper, a factor, and a salvor. In addition to these, which are treated under their own titles, it may be said that modern law tends strongly to give this security to every bailee, or person to

up the possession, afterward comes into possession anew, he does not hold the goods by his former lien for security.—In general liens are enforced in courts of equity. Upon petition, they will decree a sale of the property to pay the debt, or take such other order as the case may require. It used to be thought that this was the only way in which the holder of property by lien could avail of it. Now, however, it seems certain, in some cases of lien, and probably in all, that a creditor may himself sell the property and pay the debt to himself, holding the balance of proceeds, if any, for the debtor; provided that in all the circumstances of the sale, the notice given to the debtor, the time, place, and manner of the sale (which should, generally at least, be by public auction), he consults, in all fairness and with reasonable discretion, the rights and interests of the debtor. In some cases there may be a kind of foreclosure; in some the creditor may have a writ of *scire facias* against the debtor; in others there are precise provisions of law applicable to the case (as in mechanics' liens); and in all the fair agreement of the parties will determine their rights and obligations. There may be adverse liens on the same thing, and then the question arises as to which shall prevail; and when that which prevails is satisfied,

the other comes into effect. Thus a carrier of goods from a seller to a buyer may be notified to retain them for the seller, for payment of his price; but the carrier has himself a lien for the price of carrying them. He will therefore hold the goods for his own demand; but when that price is paid to him, or if he recovers it in any way, his lien is discharged, and his possession is now the possession of the seller, who has a lien for the price. (See SALE, and STOPPAGE IN TRANSITU.)—Another exceedingly important lien is that upon the land of the debtor, created in favor of a creditor by a judgment or final decree of a court of law. The law and practice on this subject are singularly different in different states. Thus, in the New England states and some others, a judgment is no lien whatever, nor is execution until it be levied. But in those states land may be attached on mesne process, and this attachment, when returned and recorded as the law requires, is a valid lien. In New York and a number of others every judgment and final decree are a lien on the real estate of the debtor, from the docketing of the judgment.—Another very important lien is the equitable lien of a seller of real estate for the unpaid balance of his price. This also is derived from England, and is unknown in some of our states, and exists with much variety in those in which it is recognized. In general it may be said that the vendor will have a lien on the land sold by him for any unpaid portion of the purchase price, provided he has taken no security for the same, and there is nothing in the contract of sale to negative the existence of the lien. The purchaser's own note or obligation to pay is not considered as security.—Still another lien of great importance is that of mechanics on the houses and ships they build or repair. It is of recent introduction, and depends almost wholly upon statutory provisions; and these differ so much as to leave but little resemblance between them, except on the main point. They all agree in giving to the mechanic a hold on the ship or house as his security for his work upon it, and sometimes for materials supplied. To prevent this lien from operating injuriously upon owners or purchasers ignorant of it, the various statutes require public notice by record in some form, usually with the town or city clerk where the property is situated, or some similar officer whose records are easily accessible. In most, and perhaps all of the states where this lien is known, it remains in force but a short time, usually two or three months, unless an action is brought to enforce it. (For shipping and maritime liens, see SHIPPING.)

**LIERRE** (Flem. *Lier*), a town of Belgium, on the Nèthe, in the province and 10 m. S. E. of the city of Antwerp; pop. in 1866, 15,043. It has a normal school, salt refineries, and manufactories of oil cloth and cotton.

**LIESTAL**, a town of Switzerland, capital of the half canton Basel Country, on the Ergolz, 8 m. S. E. of Basel; pop. in 1870, 3,873. The

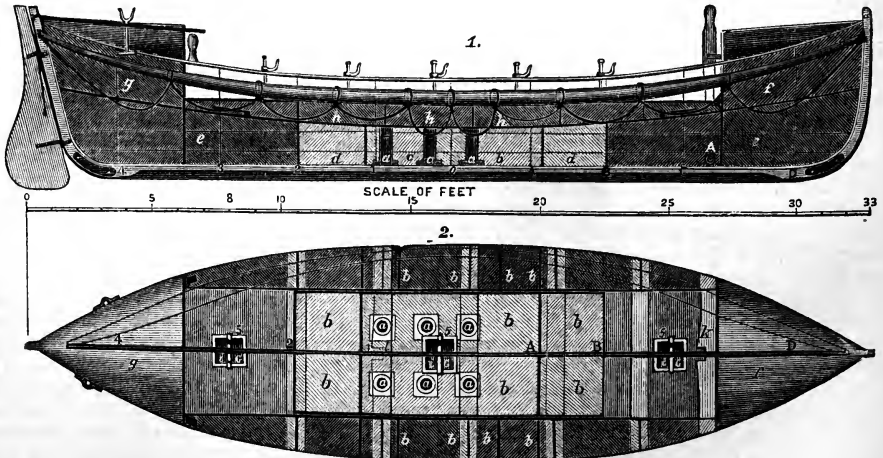
most notable buildings are the Protestant parish church and the government hall. It has also a cantonal library, a museum, manufactories of gloves, tapestry, and paper, and several breweries.

**LIEUTENANT** (Fr., from Lat. *locum tenens*, one holding the place, *i. e.*, acting for another), a title applied to various representative officers, military and civil. In most armies the lieutenant is next in rank below a captain, in whose absence he commands the company. In the United States service this officer is called first lieutenant, a second lieutenant being subordinate to him. In the British service a lieutenant in the foot guards ranks with a captain in the army; the second lieutenant is generally called ensign. In the United States navy a lieutenant ranks next below a lieutenant commander, who is subordinate to a commander. In both the American and the British service a lieutenant in the navy ranks with a captain in the army. The lieutenant colonel of a regiment is the second commissioned officer, immediately subordinate to the colonel. The lieutenant general in the United States is next in rank to the general, who, under the president, is commander-in-chief. This grade, conferred first on Washington, expired by limitation at his death. It was revived by congress, Feb. 15, 1855, and given to Gen. Winfield Scott as a brevet, but the act was so framed that the rank should not survive him. Congress again revived it by a law of March 1, 1864, when the rank was conferred on Gen. U. S. Grant. On the creation in his favor of the new grade of general, July 25, 1866, Gen. William T. Sherman became lieutenant general. When he became general, March 4, 1869, he was succeeded by Gen. Philip H. Sheridan. In the British service there are a number of lieutenant generals, who rank the same as in the American army.—In French history, the *lieutenant général du royaume* is a person invested with the powers of regent in temporary emergencies. Thus, the count d'Artois (afterward Charles X.) took this title on entering France in 1814, and held it till the arrival of Louis XVIII. The duke of Orleans in 1830 was appointed to this office by the chamber of deputies, before he accepted the crown as Louis Philippe. The lord lieutenant of a county in England is a permanent provincial governor appointed by the sovereign, whom he directly represents. He is at the head of the magistracy, the militia, and the yeomanry, and is responsible in cases of emergency for the preservation of the public tranquillity. He has the power of appointing deputy lieutenants. The lord lieutenant of Ireland is the sovereign's viceroy or deputy, to whom the government of Ireland is intrusted. He is appointed under the great seal of the kingdom, and his tenure of office depends on that of the ministry of which he is a member. He is intrusted with great powers, but acts in all matters of importance under the direct control of the cabinet of Great Britain.

**LIEVEN, Dorothea**, princess of, a Russian diplomatist, born in Riga about 1785, died in Paris, Jan. 27, 1857. Her father, Christoph von Benkendorff, originally belonging to the inferior gentry of Esthonia, pushed his fortunes by the aid of his wife, a German woman of low origin, who was a chambermaid and favorite of the empress of Paul I. Dorothea received a brilliant education, and at an early age married the prince Christoph Lieven, who was ambassador in 1811-'12 at the court of Prussia. Here the remarkable aptitude of the princess in dealing with public affairs and her eminent social qualities found full display, and she not only controlled the main springs of political action in Berlin, but succeeded in shaping the opinions of the court of St. Petersburg by her extensive official and private correspondence. In 1812 her husband was transferred to the court of St. James, where she became as conspicuous as she had been in Berlin, and until 1834 held a leading position in the highest social and political circles of England. In the latter year Prince Lieven was recalled and appointed governor of the cesarevitch (now Alexander II.), and for some time his wife discharged his functions as tutor as efficiently as she had acquitted herself of his diplomatic duties. In 1837, desiring a change in consequence of family afflictions, she removed to Paris, where she took up her residence in the hôtel Talleyrand. After the death of her husband, which occurred in Rome, Jan. 10, 1839, she continued to reside in Paris, and her house became a favorite resort of the chief political,

literary, artistic, and social celebrities of that metropolis. Politicians, diplomatists, and ladies of all parties met at her receptions; and the principal business of the Russian embassy was done in her boudoirs. She was on terms of personal friendship with almost every eminent statesman of her time, excepting Lord Palmerston, who distrusted her influence, and of whom she became accordingly an unrelenting enemy. Guizot was her most devoted admirer. After the revolution of Feb. 24, 1848, she removed to London, but returned to Paris during the presidency of Louis Napoleon, and resumed her receptions in the hôtel Talleyrand, which was regarded as the headquarters of the Orleans party. After the proclamation of the empire her saloon became again of great political importance, the princess aiding the Russian ambassador Count Kisseleff in keeping the court of St. Petersburg informed of the progress of events. After the outbreak of the Crimean war, when Kisseleff and the principal Russian residents of Paris retired to Brussels, the princess went also; but in January, 1855, she sought and received, under the plea of ill health, permission to return to Paris, where she lived in retirement until after the restoration of peace in 1856, when her hotel was again thrown open to her friends. Early in January, 1857, her health began to fail; but she was in full possession of her mental powers to the last moment. She was a Protestant.

**LIFE BOAT**, a boat constructed specially for the preservation of life in cases of shipwreck. The first patent for a life boat was granted



English Life Boat.—Fig. 1. Sheer Plan. Fig. 2. Deck Plan: *a*, delivering tubes; *b*, air cases; *c*, well; *d*, air cases; *e*, empty air cases under deck; *f*, fore air compartment; *g*, after air compartment; *h*, air cases; *k*, mast thwart; *s*, scuttles for air.

in England in 1785 to Lionel Lukin, a coach builder of London. His boat was protected by bands of cork around the gunwales, with air cases in the bow and stern, and was ballasted by an iron keel; appliances which are found in the best life boats at the present day.

Lukin's boat was subsequently improved by Admiral Graves and Henry Greathead. This was the first step ever made toward an organized plan for the preservation of life from shipwreck. Four years later George Palmer, an active member of the life-boat institution,



produced a plan for a boat which was adopted and used for more than 20 years with very successful results. In 1850 the duke of Northumberland, then president of the institution,

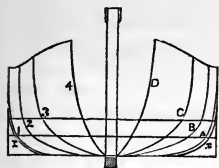


Fig. 3.—Cross Section.

offered a premium of 100 guineas for the best model of a life boat. The defects of the then existing ones were pointed out to guide inventors, chiefly as follows: 1. They do not right themselves when upset. 2. They are too heavy to be readily launched or transported along the coast. 3. They do not free themselves from water fast enough. 4. They are too expensive. A committee was formed to examine

and report upon the models, and a regular competitive examination was organized, marks being assigned to the different necessary qualifications as follows: 1, rowing boat in all weathers, 20; 2, sailing boat in all weathers, 18; 3, sea boat, *i. e.*, stability, safety, buoyancy forward for launching through surf, 10; 4, means of freeing from water readily, 8; 5, extra buoyancy, nature, amount, distribution, mode of application, 7; 6, power of self-righting, 9; 7, suitability for beaching, 4; 8, room and power of carrying passengers, 6; 9, moderate weight for transport along shore, 3; 10, protection from injury to bottom, 3; 11, ballast, as iron (1), water (2), cork (3), 6; 12, access to stem and stern, 3; 13, timber heads for securing warps, 2; 14, fenders, life lines, &c., 1; total, 100. In the following year the committee patiently examined 280 models and

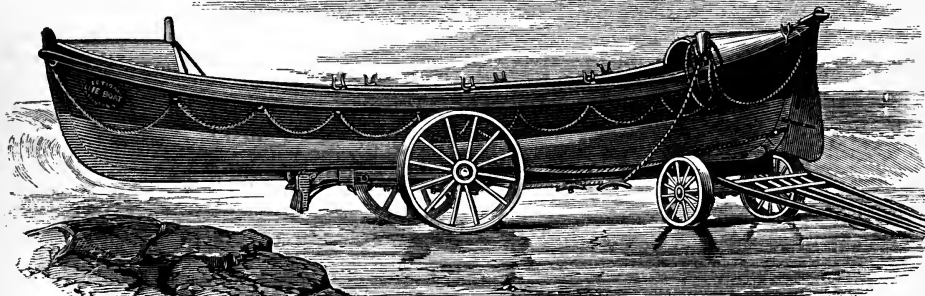
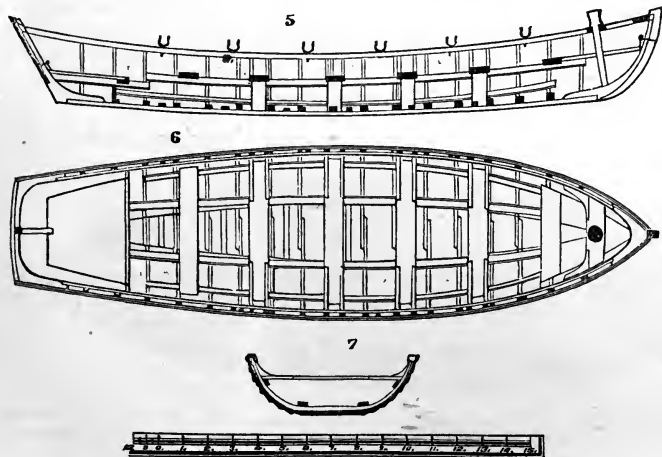


Fig. 4.—Carriage for Life Boat.

plans, and awarded the prize to James Beeching of Great Yarmouth, his boat having received 86 out of the 100 marks. A fine boat

terward improved under the auspices of the life-boat institution, and became its standard boat. Its general arrangement is shown in



American Life Boat.—Fig. 5, Sheer Plan. Fig. 6, Deck Plan. Fig. 7, Cross Section.

was built upon Beeching's plan, and being tested by severe trials proved the correctness of the committee's award. This boat was af-

terward improved under the auspices of the life-boat institution, and became its standard boat. Its general arrangement is shown in figs. 1, 2, and 3. The important properties of this boat are: 1, maximum of stability; it can only be capsized under extraordinary circumstances; 2, rights instantly after being upset; 3, when filled with water, it will discharge the same in 25 seconds; 4, is easily handled under canvas or with oars. The boat is transported on a carriage so arranged that it may be launched as from a marine railway, with the crew in place and ready for service. The royal national life-boat institute has 240 of these boats on the coast of the United Kingdom and the Channel islands, and similar boats are used on the coasts of France, Germany, and Russia.—Although many patents for life boats have been applied for in

the United States, nothing has been produced which possesses the excellent qualities of the English life boat. The boats used at the life-saving stations of the United States are ordinary surf boats of cedar, upon the plan most in favor with the surfmen on the coasts of Long Island and New Jersey. These boats are light, weighing about 700 lbs., and are easily transported on their simple carriages along our sandy beaches. It is proposed to provide many of the life-saving stations with boats after the plan of the English life boats, but slightly modified to suit the various localities.—*Life-Saving Apparatus.* During heavy gales the surf sometimes breaks against our shores with such fury that it is frequently impossible to reach a wreck with the life boat. On such occasions communication is established between the shore and the wreck by means of a line carried over the wreck by projectiles thrown from a small piece of ordnance or by rockets designed for the purpose. Under favorable circumstances at least 400 yards of the line can be carried out by either method. An eprouvette mortar of 5½-inch calibre is used in the United States life-saving stations, throwing an iron ball of 20 lbs. weight, to which the line (one inch in circumference) is attached by a spiral wire to take up the jerk. To facilitate the clear run of the line it is peculiarly coiled in a box, or laid down in long fakes on the ground. When the shot or rocket line has been successfully thrown over the wreck (fig. 8), a larger line (two-inch manila) is then attached to the shore end, and hauled off by the people on the wreck; and with that line a still larger one (four-inch hawser) is hauled on board and made fast to the wreck, as directed by those on shore by

chors, and crotches; and with the second, or hauling line, various appliances may be hauled back and forth until all hands are saved. The



FIG. 9.—Life Car.

method of transporting persons from a wreck to the shore, used exclusively on the coast of the United States, is by means of a covered

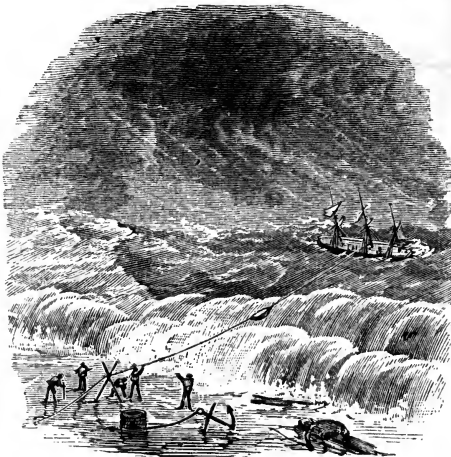


FIG. 10.—The Car on the Rope.

metallic boat, known as the life car, which is sufficiently large to contain four grown persons or eight small

light galvanized iron, and when the hatchway is closed is nearly watertight. The time usually occupied in arranging the lines and sending off the car, after firing the mortar, is about 30 minutes; and with the apparatus in proper order the car can make the passage from the wreck to the shore, traversing in each trip a distance of 350 yards through a raging surf, within ten minutes. The life car was introduced into the United States service in 1849, and in the following year was instrumental in saving 201 lives from the British emigrant ship Ayrshire, cast away on



FIG. 8.—Shooting the Rope to a Wrecked Vessel.

means of tallies attached to the line. The hawser being thus made fast, it is set up taut by the people on shore, with tackles, sand an-

Squam Beach, N. J., during a fearful snow storm. This mode for conveyance of passengers from wrecked vessels was the invention

of Capt. Ottinger, of the United States revenue marine. Its advantage over every other plan consists in landing women and children in perfect safety, and often without even getting wet.—*Life-Saving Service*. There are regular organizations, or societies, for the preservation of life from shipwrecked vessels in Great Britain, France, Germany, and Russia, supported by voluntary contributions, but under the patronage of their respective governments, and receiving aid in the way of public ordnance stores, while naval and military officers are detailed to act in various capacities in the proper management of the stations and apparatus. Humane societies having similar objects in view have long been in operation in the maritime countries of Europe; and a few years since a humane society was instituted, and is now admirably conducted, in China. The first step in the United States toward an organized effort for assisting the shipwrecked, was the establishment, early in the present century, of the humane society of Massachusetts; and its huts of refuge and volunteer life-boatmen rendered incalculable service to the unfortunate mariners whose vessels were stranded upon that bleak and rugged coast during the stormy winter months. This society was at first supported by voluntary contributions, but at last received the aid of congress, which on March 3, 1847, initiated the establishment of the present life-saving service of the United States, by appropriating \$5,000 for providing the lighthouses "on the Atlantic coast with means of rendering assistance to shipwrecked mariners." On May 11, 1848, the sum of \$10,000 was appropriated for providing rockets, carronades, and surf boats. On Dec. 14 of the same year the authority of congress was given for the regular organization of the life-saving service, and 54 stations were established on the coasts of Long Island and New Jersey, from Montauk Point to Cape May. Annual appropriations were thereafter made for the maintenance of the stations, and in 1871 a liberal appropriation of \$200,000 was granted for increasing the number of stations and improving the apparatus on the above coasts. With this sum, and further annual appropriations, the service was re-organized, and extended to the coast of Massachusetts in 1872; and there are now 104 stations on the Atlantic coast, as follows: Maine, 5; New Hampshire, 1; Massachusetts, 14; Rhode Island, 3; Long Island, 31; New Jersey, 40; Virginia, 3; North Carolina, 7. Congress passed an act, June 23, 1874, authorizing the additional establishment of 23 complete life-saving stations, 22 life-boat stations, and 5 houses of refuge upon the Atlantic, Pacific, and lake coasts. Since the first establishment of the service, the records of the treasury department, although the returns are incomplete up to 1872, show that 5,604 lives have been saved in 25 years, an average of 224 per annum. During the same period the service has

preserved from wrecks property to the amount of \$1,116,000. According to the last annual report of the royal national life-boat institution of Great Britain, 22,153 lives have been saved during the 49 years (1824 to 1873) of its existence, making an average of 452 per annum. When it is considered how greatly the commerce of Great Britain exceeds our own, and that she has more than double the number of life-boat stations, the comparison of the number of lives saved results favorably to the United States life-saving service, which has annually rescued nearly half as many lives as the older and more perfectly organized British institution.—*Life-Saving Stations*. The houses for the stations on the coast of the United States are neat and substantial frame buildings, of one story and a half, and 40 ft. long by 20 ft. wide. They afford ample room for the boats, wagon, lines, and other apparatus, with comfortable apartments for the surfmen and such persons as it may be necessary to shelter after being rescued from shipwreck. At each station

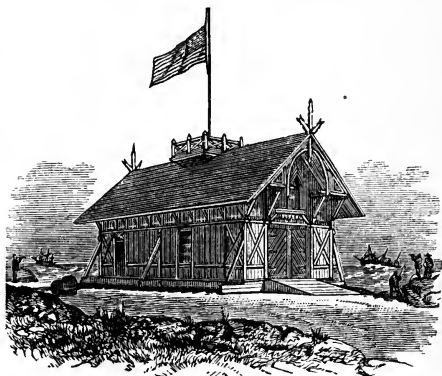


FIG. 11.—Life-Saving Station.

six experienced surfmen are employed, who remain constantly on duty during the winter months, and are in charge of a competent person, regularly appointed by the secretary of the treasury, and known as the keeper. During the winter months (from December 1 to April 1) the beaches are patrolled night and day by the surfmen, and the discovery of a wreck is instantly made known by means of a system of signals (flags by day and colored lights at night). On the coasts of Long Island and New Jersey the stations are at an average distance of four miles from each other, and on the occurrence of a disaster near one station the neighboring stations soon render assistance. The coast is divided into districts, each being in charge of a superintendent appointed by the secretary of the treasury; and the whole coast is under the general supervision of an inspector, designated from the list of captains in the revenue marine service by the secretary of the treasury, who has charge of the whole service and alone authorizes all expenditures. Connected with

the life-saving service is the storm signal system of the United States signal service; and on the approach of a storm danger signals are displayed upon the flag staffs of the stations along the coast, warning all vessels in sight to seek a harbor or gain a safe offing.—*Life Preservers*. There are many devices for the purpose of buoying persons in water; the form most commonly in use is in the shape of a jacket, made of light canvas with cork attached. The most of those commonly furnished to sea-going vessels are untrustworthy on account of the inferiority of the cork used in their manufacture. The best cork jacket is that known as the "life belt," invented by Capt. Ward of the British navy, and adopted by the royal national life-boat institution and the United States life-saving service, also in general use by European life-boat institutions. The body of the belt is composed of light flax canvas, tarred to prevent mildewing, and the best



Fig. 12.—Life Belt.

of cork is firmly sewn on in slabs without covering. It sustains a dead weight of 28 lbs., a buoyancy of 16 lbs. only being necessary to support a living man in water. The requisite qualities of a life-boatman's life belt are: 1, sufficient extra buoyancy to support a man heavily clothed, with his head and shoulders above the water, or to enable him to support another person besides himself; 2, perfect flexibility, so as to readily conform to the shape of the wearer; 3, a division into two zones, an upper and lower, so that between the two it may be secured tightly round the waist; for in no other manner can it be confined sufficiently close and secure round the body without such pressure over the chest and ribs as to materially affect the free action of the lungs, impede the muscular movement of the chest and arms, and thereby diminish the power of endurance of fatigue, which, in rowing boats, is a matter of vital importance; 4, strength, durability, and non-

liability to injury. Life preservers have been made of various other forms and materials, the object in view being to furnish a very buoyant article that can be readily and securely attached to the upper part of the person, or seized and held by those in the water. Hollow vessels of wood or tinned iron, made air-tight, and shaped so as to serve on board the vessel as seats, have been much used. In one form the seat is made double, and opening on hinges forms a rectangular float, in the centre of which is an aperture sufficient to admit the body of a man, his arms hanging over the sides. Bags of caoutchouc, so made as to be readily filled with air by blowing into them, and shaped for fitting round the neck or body, have also been largely employed for life preservers; and they have been made into vests, shirts, and jackets, which can be distended with air, giving great buoyancy to the person wearing them. By the law of the United States, and also of some of the separate states, steamboats are required to carry a certain number of life preservers, proportionate to their passenger capacity.

**LIFE INSURANCE**, a contract whereby an insurer engages, for a consideration called a premium, to insure a person against a certain amount of pecuniary loss supposed to be consequent upon the decease of a certain life. The personal right of property is the chief spur to human industry, and thus lies at the foundation of civilized society. Yet the isolation which grows out of it results in such evils as to suggest communism as a remedy. Legitimate insurance is a borrowing of communism just enough to cure some of the worst evils of family isolation, without impairing the stimulus to personal exertion arising under it. In a general point of view the most important case of insurance is that which covers, for the benefit of a helpless family, the chief source of its sustenance, the life of its productive head. The history of life insurance shows, however, that an institution which has abundantly justified its existence is still in its infancy, struggling amid very unsettled methods. The doctrine of probabilities developed by Pascal and Huygens, in regard to games of chance, was first applied by Jan De Witt of Holland, in 1671, to life contingencies, but only to determine the value of life annuities and reversions, with a view to aid the government in raising loans. Its application to life insurance was not made till nearly 90 years later. Little more than a quarter of a century, however, passed away before the first distinct germs of modern life insurance, as a provision for widows and orphans, made their appearance in the London "Mercers' Widows' Fund" of 1698, the "Society of Assurance of Widows and Orphans" of 1700 in the same city, and the famous "Amicable Society for a Perpetual Assurance Office," also founded there in 1706, which continued in existence till 1867. The first two seem to have passed away without leaving any trace of their plan of operations;

but we know that till a very recent period the "Amicable" placed no reliance upon the science of biological contingencies. It was purely mutual; each member, without regard to age, contributed to the common fund a fixed entrance fee, and also a fixed annual payment per share on from one to three shares. At the end of each year a portion of the fund was divided among the heirs of the deceased members in proportion to the shares held by each. Thus the amount insured depended on the number who died, subject to the vote of the members who survived as to the portion of the common fund which should be divided. At first, for the sake of accumulating a fund, only a small dividend was voted; it was gradually enlarged from £30 to £90 a share. As the annual payment was £5 a share, this at best was very dear insurance, except for bad or old lives. There was no medical selection except so far as the members themselves exercised it in voting in new members. After some experience this was done with considerable caution and judgment; the age of admission was limited to 45, and there were restrictions in regard to dangerous occupations, travel, and military service. After a considerable fund had accumulated, the dividends became larger by reason of the smaller proportion of deaths and the greater liberality in voting the amount to be divided. From 1760 to 1780 it averaged about £174 a share, which would have been a fair amount supposing the members had all entered at the age of 40. It was not till this society had existed more than a century that anything like modern equitable and scientific life insurance was engrafted upon it. Prof. De Morgan described it in 1838 as "founded rather on the principle of mutual benevolence than mutual insurance." It lived to a very respectable age by the wisdom of accumulating a considerable fund, and not promising a fixed amount of dividend or insurance, but died at last for want of science to graduate the payments according to the risks, and to exclude bad ones.—In 1760 Thomas Simpson, who 20 years earlier had published a valuable work on life contingencies, in connection with Mr. Dodson, another mathematician, applied for a charter of the "Society for Equitable Assurances," on the plan of graduating the premium to insure a prescribed amount according to the probabilities of living after the age of entry. But the crown refused a charter, on the ground that it would be unjust to existing companies which had paid large sums for their charters, and because it was an untried speculation depending "on the truth of certain calculations taken upon tables of life and death, whereby the chance of mortality is attempted to be reduced to a certain standard." Mr. Simpson died the next year, but in 1762 the famous "Equitable" was founded, without a charter, by a deed of settlement. It does not seem to have achieved much success till it had called in the powerful aid of the Rev. Richard

Price, the author of "Observations on Reverſionary Payments" (1769). He gave the Equitable its Northampton table of premium rates, as well as some excellent advice about the necessity of not being led "to check or stop the increase of its stock too soon" through the encouragement arising from the possession of a large surplus, meaning by this the necessity of keeping an adequate premium reserve. By a fortunate error in the Northampton table, the premiums were so high that the "stock" or reserve increased rapidly, and so much real surplus over the necessary reserve accumulated, that the society began in 1791 to make additions to the policies, which, though small at first, were enlarged every ten years, till one who had entered in 1790, at the age of 30, for £100, in 1849, at the age of 89, was insured for £626, without any increase of the original annual premium, which was £2 13s. 4d. This large addition to the old policies is not so wonderful when we consider that Dr. Price had laid down the maxim that "the plan of a society ought always to be such as that the loss arising from discontinuance of payments should fall on the purchaser, and never on the society." Hence, as any discontinuing member forfeited his share of the society's stock or reserve, the persisting members had the more; and it must be remembered that £1 per annum at 5 per cent. will amount in 59 years to £353, so that the premium paid would amount to £940. A fair reserve on the increased policy for £626 would be about £556. The Equitable, arising amid a large number of bubbles, which were pricked by Dr. Price, and adopting his principles and precautions, proved a great success. But whoever reverts to the writings of Dr. Price in regard to the various schemes for the relief of widowhood and orphanage by insurance, and for provision for old age by annuities and endowments, will be struck with the fact that he looked almost exclusively at the security and permanence of the society, and very little at the contingencies of the individual. It does not seem to have occurred to him that provision both for his heirs and for the old age of the insured himself could be secured in the same policy, or that the cessation of the necessity for either provision could be provided for in the policy by a stipulation of terms of surrender. Dr. Price is justly regarded as the father of modern life insurance. What has since been done and what remains to be done are mere corollaries to his general propositions. By the writings of Dr. Price and the solid establishment of the Equitable a large number of ill-advised schemes, possessing the same objects and started about the same time, were swept away before they had done much mischief. But the great success of the Equitable some years later brought forth a new and numerous brood of imitators and rivals. A few of these became strong and healthy institutions, but their history for the most part is one of wreck and disaster. The "Insurance Hand-



book," published in 1867 by Mr. Cornelius Walford, a very able and painstaking writer on insurance, gives a list of the life insurance offices existing in the United Kingdom at that date, comprising 117, of which 3 were "proprietary," 26 "mutual," and 88 "mixed." It also gives a list of 240 companies which had gone out of existence, either by absorption in other companies or by dissolution in the court of chancery, during the previous 23 years. The wrecks within the present century up to this time would doubtless double that list. Of the 240 disappearances recorded by Mr. Walford, 33 companies died in the year of their birth, 102 died under 5 years of age, 105 died over 5 years of age, 35 over 13 years, 9 over 30 years, and 4 over 50. The oldest had attained the age of 77 years. While half of these defunct corporations may probably be set down as mere abortions, injurious only to subscribers to the stock, and some of the others may have coalesced, or "amalgamated," to use the English term, with other companies, without injury to their policy holders, a considerable number must have perished by grossly incompetent or dishonest management. Some of these failures doubtless arose from want of care in rejecting bad risks, but the prime cause must have been extravagant expenses of management—the failure to retain and accumulate at interest the excess of the net premiums received over the actual death claims; or, in other words, from regarding any such excess as "surplus." The mischief of these failures is beyond computation. The recent wrecks of the Albert and the European, the former comprising by amalgamation 27 and the latter 40 corporations, have inflicted a blow which no business except one of almost absolute necessity could survive.—This very great difference has existed from the first between the life insurance companies of Great Britain, that what some consider a reserve from past premiums necessary to supply the deficiency of future ones, others consider as surplus or profit, and consequently expend or divide it. Even so late as July, 1874, the officers charged with reporting to the president of the board of trade on this subject say: "It will hardly be believed that the board of trade could have had submitted to them, for acceptance under the life assurance companies' act of 1870, valuations in which the future profit, future expenses, and even future commissions, have been turned into present value, and the whole represented as profit. These accounts have been rejected as being manifestly incorrect and misleading, and amended returns requested." This distinction between past and future payments, which is one of life and death, will be plain enough when we come to consider the elementary principles of the business. The ease with which life insurance companies have converted probable future profits into assets, and the plausible excuses for doing it, have cost the British parliament very laborious discussion and inquiry, to find some method of

shielding the public from its disastrous result. But all investigation and legislation up to the act of 1870 seems to have had an effect exactly the reverse of that intended. That act has obviously checked the formation of new companies by requiring a deposit with the government of £20,000; it has put an end to fraudulent amalgamations by requiring the terms of any union to be submitted to the court of chancery for approval; and it promotes honesty of management by requiring an annual statement of all details to the officers of the board of trade. These statements are such as to expose extravagance and give fair warning of any tendency to insolvency. There are said to be 125 companies now existing in the United Kingdom, all but five of which made returns in 1873. The premium income was £10,824,093, amount of insurance outstanding £338,882,752, and the reserve fund £94,260,592, with an average interest of 4.41 per cent. The Equitable, which was once the largest in point of funds if not of insurance, having an accumulation of more than £10,000,000, and which has still the largest reserve in proportion to its amount, is now the fifteenth in amount of insurance and the fifth in the magnitude of its fund. It may expire, but it will not fail. There were 21 companies having over £5,000,000 each insured, and five having over £10,000,000. The Scottish Widows' had £14,572,154, and the Standard £16,867,577. The greater part of the companies are ably managed institutions. The strength of our own more recent but not smaller institutions is well known, and it may be interesting to compare the aggregate figures of the two. Referring to the latest official reports on both sides, probably not exhaustive on either, but more nearly so in Great Britain than here, the amounts insured, funds in reserve, and death claims paid within a year, are as follows:

COMPANIES.	Amount insured.	Funds.	Death claims.
British.....	\$1,640,192,519	\$512,660,011	\$38,586,659
American.....	2,086,027,178	860,140,684	27,232,435

Considering that the American companies average a little less than 15 years of age and the British over 32, it will be instructive to compare the ratios of funds to amount of insurance; also the ratios of death claims to insurance and to funds:

COMPANIES.	Ratio of funds to insurance.	Ratio of death claims to insurance.	Ratio of death claims to funds.
British.....	31.2 per cent.	2.35 per cent.	7.52 per cent.
American.....	17.3 " "	1.30 " "	7.56 " "

This shows how as the companies grow older the reserve fund must bear a greater ratio to the amount of insurance outstanding, because the death claims will bear a greater ratio. The American ratio of funds to insurance is considerably larger than it otherwise would be on

account of the greater prevalence here of endowment insurance, which requires a more rapid accumulation of reserve; and for the same reason the American ratio of death claims to funds is a little smaller than it would otherwise be. In a well managed company it decreases a little as the age increases. When the reverse happens, and where for successive years it exceeds 15 per cent., danger arises. The premium income of the British offices was \$52,388,610, while that of the American was \$96,000,088. This large excess of the American premium income in proportion to the insurance is perhaps slightly due to the practice of diminishing the premiums in some British offices by enlarging the reserve, as a mode of returning surplus; but it is chiefly due to the much larger proportion of endowment insurance done by American offices. The distribution of \$38,000,000 a year among families bereaved of their heads by death produces a degree of public satisfaction not to be seriously disturbed by cases of failure or traits of imperfection. The attending evils have always been keenly felt, but they have been submitted to with little complaint for the sake of such good as could be found nowhere else.—The early abuses of life insurance in England were checked by a statute (14 George III., c. 48) enacting that "no insurance shall be made by any person or persons, bodies politic or corporate, on the life or lives of any person or persons, or on any event or events whatsoever, wherein the person or persons for whose use, benefit, or on whose account such policy or policies shall be made, shall have no interest, or by way of gaming or wagering; and that every assurance made contrary to the true intent and meaning hereof shall be null and void to all intents and purposes whatsoever." This statute has been held to apply only to the inception of policies. It takes no effect when the insurable interest ceases during the term, as it usually does when a person insured for the whole life lives to a great age. To carry out the intent of the statute in regard to such policies is an unsolved problem, which will probably require for its solution a stipulation in the policy of a proper surrender value.—The creation of corporations in America with power to insure lives and grant annuities dates back beyond the revolution. Dr. Richard Price and his friend Benjamin Franklin interested themselves in prescribing rates and rules for one which was chartered in the province of Pennsylvania as early as 1769, for the benefit of the families of Episcopal clergymen. The "Massachusetts Hospital Life Insurance Company" and the "New York Life and Trust Company" may be mentioned among the pioneers of the early part of the century, none of which have ever obtained much business. Four companies started successively in 1843, 1844, 1845, and 1846, in New York, Massachusetts, New Jersey, and Connecticut, were the first to win success. They now combine almost one third

of the insurance and considerably more than one third of the accumulated funds. The existing companies are nearly as numerous as in Great Britain, and perhaps as various in quality; but the number of failures has not been as great nor attended with as much disaster. The rapidity of the growth of life insurance after 1843, and especially since 1858, is remarkable. Thirteen companies, including the four above referred to, reported to the state of Massachusetts in 1858 an aggregate of 42,450 policies, insuring \$116,348,995. The same companies in 1869 reported 298,661 policies, insuring \$907,187,407, having increased more than seven fold in 11 years. The increase during the last four years has been less rapid, the same companies reporting in New York, in 1873, 346,884 policies, insuring \$985,752,299. It will be observed here that the number of policies increased faster than the amount insured, which is accounted for by the large number of small "paid-up" policies taken as surrender value of larger annual premium policies. The most striking and significant fact in the history of American life insurance, however, is the 404 fold increase of endowment insurance in those 11 years, coupled with its non-increase, if not decrease, since. The British life insurance companies are remarkable for their great variety of policies; for though ordinary whole-life policies, payable by annual premium during life, together with "paid-up" additions, called "bonuses" or reversionary dividends, constitute the bulk of their business, most of them issue a few joint-life and survivorship policies, ordinary whole-life, payable by single or a limited number of premiums, or by ascending or descending scales of premium, short-term, pure endowment, and endowment insurance policies. The exact amount of the last class cannot be ascertained from the blue books under the recent act, because the policies are classified in the returns only in valuation years, which occur annually in only a very few companies, but usually in periods of from three to ten years. An examination of the returns for the first two years under the act shows \$14,832,698 of endowment insurance out of \$652,398,091 of all sorts, or about 2·27 per cent.; and this is probably about its ratio for the whole. These policies are issued in Great Britain for premiums substantially the same as in this country, which enhances the interest of the inquiry why they should, for ten years at least, have been so much more abundantly popular here. The following tables from the New York "Insurance Times" of 1873, drawn from the Massachusetts and New York insurance reports, furnish a foundation for the study of a most important phase of this subject. The first gives the amounts outstanding, divided into three classes, of the insurance reported by all the companies in 15 successive years, and the percentage of the endowment insurance to the whole. The second table gives the annual in-

crease or decrease of this percentage, showing the acceleration, culmination, and incipient relative decline of this branch of the life insurance business:

TABLE I.

Number and amount of three classes of Policies, and ratio of Endowment amounts to the whole.

YEARS.	WHOLE LIFE.		ENDOWMENT.		SIMPLE TERM.		Per cent. of endow'm't to the whole.
	Number.	Amount.	Number.	Amount.	Number.	Amount.	
1853.....	38,281	\$107,659,465	278	\$988,900	8,999	\$7,588,830	0.85
1859.....	44,598	123,913,596	869	1,252,256	8,645	7,574,974	0.94
1860.....	51,230	142,176,279	668	1,974,437	8,446	7,148,114	1.8
1861.....	53,848	144,258,449	846	2,417,658	2,945	6,267,475	1.58
1862.....	71,425	189,494,896	1,567	8,958,437	2,950	5,510,250	1.99
1863.....	92,083	245,525,587	3,119	8,448,450	2,741	5,751,153	3.25
1864.....	136,565	357,304,512	7,007	18,893,702	2,990	6,481,974	4.92
1865.....	190,037	507,168,417	17,705	46,445,160	2,767	7,030,700	8.23
1866.....	262,354	759,662,095	44,281	119,460,867	3,361	10,990,660	13.73
1867.....	336,257	967,113,546	91,566	284,695,681	3,182	10,598,910	19.85
1868.....	409,850	1,194,620,763	132,432	382,723,827	3,557	12,650,840	21.61
1869.....	475,728	1,379,764,566	165,727	399,855,959	4,692	16,527,490	22.26
1870.....	538,513	1,510,224,564	183,847	418,381,941	4,438	17,335,119	21.50
1871.....	543,605	1,513,433,393	169,560	380,011,733	5,552	17,952,459	19.86
1872.....	570,206	1,374,904,424	178,984	404,263,370	5,335	17,439,763	20.22

TABLE II.

Acceleration, Culmination, and Decline.

YEARS.	Gain or loss per cent.	YEARS.	Gain or loss per cent.
1859.....	0.09	1866.....	5.45
1860.....	0.39	1867.....	5.62
1861.....	0.23	1868.....	2.26
1862.....	0.41	1869.....	0.65
1863.....	1.23	1870.....	-0.76
1864.....	1.67	1871.....	-1.64
1865.....	3.36	1872.....	0.36

—*State Supervision.* The failures of life insurance companies in Great Britain, and the necessity of some governmental safeguard against the peculiar facilities for fraud furnished by this business, as demonstrated by Mr. Wilson's celebrated parliamentary committee in 1853, caused the legislature of Massachusetts in 1855 to establish an insurance commission, one of whose duties was to exact and publish annually detailed returns of the assets and liabilities of all life insurance companies doing business in the commonwealth. For some years previous it had been required by law in Massachusetts that every company transacting business there should deposit with the secretary of state an annual statement of its assets and liabilities, including the value of its policies. But these returns in some cases (see eighth life insurance report of the insurance commissioners) were very far from being satisfactory. Hence the commission established in 1855 was authorized, though not imperatively required, to test the accuracy of the returns by a valuation of the policies. The first three reports of the commission were without the application of any such test. The fact that at least two companies, one of them an English one, were operating extensively in the state with an apparently insufficient reserve fund, induced the legislature in 1858 to make a valuation of the policies of all companies obligatory upon the commissioners. Such valuations of the policy liabilities have been made annually

ever since, and are on record in the office of the commissioners. An insurance department with similar powers and duties, except that for several years it made no valuations, was established in the state of New York in 1860, by an act dated in 1859. In consequence of the law making it the duty of the commissioners in Massachusetts to value the policies, one company immediately ceased to issue new policies in the state, and another, being found to possess only a little over one third of the requisite premium reserve, showing a deficiency of over \$1,000,000, was obliged to retire. One consequence of this success in checking fraud was to inspire public confidence in the companies that stood the test. Hence many sought to do business within the narrow borders of Massachusetts, not in the hope of gaining much, but for the sake of the credit which their standing in its reports would give them in other and broader fields. In 1865 the number of companies reported had increased from 13 to 31; in 1870, to 64. Since then the number has considerably decreased. As an offset to any benefits of state supervision, it must undoubtedly be set down that it has inspired too much public confidence in the corporations that have passed its ordeal. Another misfortune is, that what any state does with any appearance of success, especially in the way of increasing offices, every other state must do. Hence state insurance departments have become so multiplied, that the charges on a company whose business extends into many states have become almost insupportable. From the inception of state supervision the danger of this has been felt; and unavailing efforts have been made to substitute national for state supervision, or to constitute a single board of impartial and scientific experts, whose valuations should be accepted by all the states instead of those of state bureaus. In England those officers of the companies who are responsible for the maintenance of the proper reserve fund are generally

members of a corporate body entitled the "British Institute of Actuaries," which has power to maintain a high standard of scientific attainment, meets stately to discuss all mathematical questions pertaining to life insurance, and publishes a journal devoted to the subject. The conservative influence of this body is very obvious, and the soundness of so large a portion of the British companies is doubtless due in some measure to it and a similar organization in Scotland. But, the members being generally connected with the companies in subordinate rather than commanding positions, it is equally obvious that the institute has no great power of progress or reform. Its labors in developing the law of mortality, as exemplified in the general population, in particular occupations, and in insured lives, have been of great value, and practically conclusive. But beyond the better adjustment of rates, it has not originated many practical improvements, nor eliminated many of the errors and imperfections which time has shown in the work of Dr. Price. There is a marked illustration of this in its relation to Dr. William Farr, a member of the institute and actuary in the registrar general's office. His masterly manipulation of the British census returns has given him the highest place in the world among statisticians. Twenty-five years ago, in his letter to the registrar general, given in the 12th annual report of that officer (1849), he demonstrated and began to advocate an improved plan of life insurance, founded on a recognition of a more distinct right of the policy holder to a certain portion of the fund arising from the premiums. The scientific and practical merit of the system seems to have been tacitly admitted by the institute; yet it has not been adopted by any of the old companies, and the several new ones that have been started to carry it out have either died of inanition or are in danger thereof. Dr. Price insisted on nothing more strenuously, as essential to safety, than that every life insurance company should be headed by some thoroughly scientific person. The success and permanence of the business depends fully as much on the rarer qualities of medical and mathematical ability as on the more common quality of commercial skill.—*Elements of Life Insurance.* The principle of equity at the foundation of a mutual life insurance company is, that payments shall be proportional to risks. Each member must pay toward the death claims which may occur in a given time a sum to be determined by the company's risk of having to pay the claim arising from his own death in that time. The first question is, how to measure this risk. As the probability of dying within a given time is greater, other things being equal, as the age is more advanced, the insurable portion of life is, for simplicity, divided into equal units of time, during each of which the risk is assumed to remain the same, while it differs

in successive units, increasing as the age advances more and more rapidly according to a definable law. The unit of time commonly assumed is one year, and there is a great convenience to the calculations in assuming that premiums and interest are payable also by coincident yearly rests. The law or table of mortality deduced by the British actuaries from observations on insured lives, first published in 1843, and amply confirmed by later observations, is given below, with the chances of death each year out of 1,000, and the consequent natural premiums payable at the beginning of each year of age to insure \$1,000 payable at the end of the year, provided death should occur within it:

ACTUARIES' TABLE.

From the combined experience of 17 English Companies.

AGE.	Living.	Dying.	Chances out of 1,000 of dying in one year.	Natural premium to insure \$1,000 for one year.
10....	100,000	676	6.76	\$6 50
11....	99,824	674	6.79	6 53
12....	98,650	672	6.81	6 55
13....	97,978	671	6.85	6 59
14....	97,307	671	6.89	6 63
15....	96,636	671	6.94	6 68
16....	95,965	672	7.00	6 73
17....	95,293	673	7.06	6 79
18....	94,620	675	7.13	6 86
19....	93,945	677	7.21	6 93
20....	93,268	680	7.29	7 01
21....	92,588	683	7.38	7 09
22....	91,905	686	7.46	7 18
23....	91,219	690	7.56	7 27
24....	90,529	694	7.67	7 37
25....	89,835	698	7.77	7 47
26....	89,137	708	7.99	7 58
27....	88,434	708	8.01	7 70
28....	87,726	714	8.14	7 83
29....	87,012	720	8.28	7 96
30....	86,292	727	8.42	8 10
31....	85,565	734	8.58	8 25
32....	84,831	742	8.75	8 41
33....	84,089	750	8.92	8 58
34....	83,339	758	9.10	8 75
35....	82,581	767	9.29	8 93
36....	81,814	776	9.48	9 12
37....	81,039	785	9.69	9 31
38....	80,258	795	9.91	9 53
39....	79,458	805	10.13	9 74
40....	78,653	815	10.36	9 96
41....	77,888	826	10.61	10 20
42....	77,012	839	10.89	10 48
43....	76,178	857	11.25	10 82
44....	75,316	881	11.70	11 25
45....	74,485	909	12.21	11 74
46....	73,526	944	12.84	12 35
47....	72,552	951	13.52	13 00
48....	71,601	1,021	14.26	13 71
49....	70,580	1,063	15.06	14 48
50....	69,517	1,108	15.94	15 33
51....	68,409	1,156	16.90	16 25
52....	67,258	1,207	17.95	17 26
53....	66,046	1,261	19.09	18 36
54....	64,755	1,316	20.31	19 58
55....	63,469	1,375	21.66	20 58
56....	62,094	1,436	23.13	22 24
57....	60,658	1,497	24.68	23 73
58....	59,161	1,561	26.39	25 37
59....	57,600	1,627	28.25	27 16
60....	55,973	1,698	30.34	29 17
61....	54,275	1,770	32.61	31 36
62....	52,505	1,844	35.12	33 77
63....	50,661	1,917	37.84	36 38
64....	48,744	1,990	40.83	39 26
65....	46,754	2,061	44.08	42 39
66....	44,098	2,138	47.61	45 78
67....	42,505	2,191	51.47	49 49
68....	40,974	2,246	55.63	53 49
69....	38,128	2,301	60.09	57 78
70....	35,887	2,327	64.98	62 44

ACTUARIES' TABLE—continued.

AGE.	Living.	Dying.	Chances out of 1,000 of dying in one year.	Natural premium to insure \$1,000 for one year.
71....	88,510	2,351	70-16	67 46
72....	81,159	2,362	75-80	72 89
73....	23,797	2,353	81-88	73 78
74....	26,439	2,339	88-47	85 07
75....	24,100	2,308	95-56	91 89
76....	21,797	2,249	108-18	99 21
77....	19,548	2,179	111-47	107 18
78....	17,369	2,092	120-44	115 81
79....	15,277	1,957	130-06	125 06
80....	13,230	1,866	140-41	135 01
81....	11,424	1,730	151-44	145 61
82....	9,694	1,582	163-19	156 92
83....	8,112	1,427	175-91	169 15
84....	6,655	1,265	189-63	182 88
85....	5,417	1,111	205-10	197 21
86....	4,306	953	222-43	213 92
87....	3,348	811	242-23	232 92
88....	2,537	673	265-27	255 07
89....	1,864	545	292-35	281 14
90....	1,319	427	323-78	311 28
91....	692	322	360-99	347 10
92....	570	231	405-26	389 68
93....	339	155	457-23	439 64
94....	184	95	516-30	496 45
95....	89	52	534-27	561 80
96....	37	24	643-65	623 70
97....	13	9	692-31	665 63
98....	4	3	750-00	721 15
99....	1	1	1000-00	961 54

It is assumed for the sake of simplicity, both in calculation and practice, that insurable lives of the same age, counting always either from the nearest birthday or the next succeeding birthday, are of the same risk. This assumption of course cannot accord with the actual facts, but it accords sufficiently well with our attainable knowledge of the facts; and to attempt a distinct classification on other grounds than age would in some measure defeat the very end of life insurance. The only exception made in practice, to any considerable extent, is, that when individuals are admitted not fairly up to the average standard of health, either an arbitrary extra premium is charged, or the premium is arbitrarily charged which belongs to a more or less advanced age. The natural premiums above given are supposed to be payable at the beginning of the year, and the death claims to be settled at the end of it. Hence the value of the risk, or chance of dying out of a thousand, is discounted a year, and, for the sake of safety, at the low interest of 4 per cent. The policies being all equal, if the deaths should occur out of the persons insured at each age precisely according to the table, and there were no working expenses, and exactly 4 per cent. should be realized on the premiums, these natural premiums would exactly settle all the death claims at the end of the year, and there would be nothing left. But supposing the policies unequal, and paid for according to amount as well as age, if the assumed interest is realized, any one of three probable events, in the absence of the other two, may make the natural premiums insufficient. The number of deaths may exceed the tabular expectation; they may not be distributed among the ages according to the tabular

expectation; or the average death claim may exceed the average policy. To guard against these adverse contingencies, as well as to provide for the working expenses, besides the precaution of assuming a rate of interest in all the calculations below that which is expected, it is deemed necessary to add to the net natural premiums, as well as to the artificial ones into which they are commuted, what is called a "loading." It is plain that, if we can rely upon the deaths in a very numerous company being distributed among the ages very nearly according to the above table, and upon bad risks being excluded by the medical officers to such an extent that the aggregate mortality shall much oftener fall below than above that expected, with a proper addition for the expenses and the contingencies above named, a mutual insurance company, including all ages and considerable difference in amount of policy, can be safely founded on these natural premiums for one year. At the end of the year, if the contracts to pay the ascending scale of premiums extended for many years or for life, there would be nothing but a stipulation without penalty to prevent sound lives from discontinuing their policies, while the impaired lives would be pretty sure to continue. Here is a moral hazard too great to be incurred in the present state of society. A company so organized would inevitably become bankrupt, unless at the start it exacted of every policy holder, as security for the continuance of the payments, a deposit, to be forfeited in case of discontinuance, sufficient to make the company whole against the loss of its best life. Other objections to an ascending scale of premiums will readily occur. The impracticability of founding a permanent company on the natural ascending scale of premiums led to commuting them at the start into single premiums, or equal annual premiums, payable for a limited number of years or during the whole term of the policy. This was very naturally done by Mr. Simpson and Dr. Price, because in the old unscientific system which they supplanted the payments were equal. The improvement was to make them different for different ages of entry, allowing them still to remain, as before, equal for the successive years of the same age of entry. Thus was at once solved the problem of securing against discontinuance, by the forfeiture of the early excess of the level premiums. The security, unfortunately, became too ample as the policy proceeded, even to the extent of keeping it in force after the cessation of the insurable interest. Time had to reveal this defect, which might have been foreseen at first, but was not; and it will probably take a good deal of time to remove it. Nothing can contribute more to this desirable end than thoroughly to popularize the method of commuting the net natural ascending into the net equal annual premium. Though algebra is very convenient in this process, it is an entire mistake that it cannot be perfectly understood without



it. Recurring to the actuaries' table, it will be noticed that the natural premium to insure \$1,000 for one year, at the age of 99, is simply the present value of \$1,000 certainly due in one year. It is assumed that the insured, at whatever age he entered, will certainly die in that year, if he should live to enter it. Hence, so far as the calculation is concerned, a whole-life policy, payable at death whenever that event may occur, is identical with an endowment policy payable at 100 or on previous death. Hence, in converting the natural premiums of a whole-life policy, under this table, into a level annual premium, we are doing the same thing as commutating the natural premiums of an endowment insurance payable at 100 or previous death. But if the table had assumed that human life terminates at 40 instead of 100, the mortality of the ages previous to 39 being just the same, then the natural premium of age 39 would be the same as 99, viz. (at 4 per cent.), \$961 54 per \$1,000; and an endowment insurance policy, at whatever age entered, payable at 40 or previous death, would be identical, under the assumption, with a whole-life policy. Hence the method of commutating must be the same, whether life is supposed to stop at 99 or at 40. The patience of the reader however will be least taxed by selecting a policy only long enough fairly to illustrate the mode of operation. Let the age of entry be 32, and life terminate at 40. Let the natural premiums from the table, with that of the new assumption of no life beyond 40, be placed against the ages in column A. In column B place the present values of \$1 payable certainly when the premiums are due, discounting at 4 per cent. compound interest. In column C place, in decimal form, the fractions expressing the chance of the insured being alive to pay each premium when due.

\$961 54 which is payable at the end of seven years would be worth only  $.7599 \times 961.54 = \$730.67$ , if it were payable certainly. But as there are only 9,367 chances out of 10,000 that it will be paid at all, it is really worth only  $.9367 \times 730.67 = \$684.41$ . The values of the anterior payments in column D are ascertained in the same way, and their sum, \$738 64, is the single premium equivalent, if paid in advance, to all the natural ones. To ascertain the equal annual premium equivalent to this single one, we must first find the value of one dollar payable annually during the term, if the person is alive to pay it. This is done simply by substituting unity for the natural premiums in column A and placing the products in E; or, to be more particular, the first dollar is payable certainly in advance, and we set that down undiminished in column E. The present value of the dollar payable in one year is given in column B as .9615, and the chance of its being paid in column C as .9913. Hence its value is  $.9615 \times .9913 = .9531$  in column E. And in the same way the factors in B and C produce all the present values in E, the sum of which, \$6,795.9, is the present value at the start of \$1 payable annually, subject to the chance of the person being alive to pay it. By rule of three, as this present value, \$6,795.9, is to the equivalent payment of \$1 a year, so is the present value of all the natural premiums, \$738 64, to the equivalent level annual premium, \$108 69. This may be tedious, but it is plain, and it is absolutely all there is in commutating the natural premiums of the scale into the level net premiums of practice. No matter what is the length of the policy's term, each possible year of it must be treated separately, as above, in commutating directly from the original scale of living and dying.—The security for the fulfilment of the contract and persistence of the payments, in other words against the deterioration of the average vitality, which arises from the commutation of the natural premiums, has already been remarked. A still more important thing is its effect on the risks assumed by the company. A contract to insure a given sum for life, on the payment yearly in advance of the natural premiums, is a contract to carry a series of risks of ever increasing magnitude. The equivalent level premium has the effect of throwing a portion of those risks from the start, and growing larger and larger to the end, on the insured party himself; and in all cases of endowment insurance, the more so the shorter the term. It in fact converts what was wholly insurance into two complementary processes of insurance and self-insurance, the former (unless the policy extends beyond the age of 75) a constantly decreasing and the latter an increasing series. The non-recognition of this important fact in the conduct of ordinary whole-life (that is, longest possible) endowment insurance has constituted that most serious defect in British life insurance which Dr. Farr has labored so

AGE.	A.	B.	C.	D.	E.
32.....	8.41 × 1	× 1	=	8.41.....	1.0000
33.....	8.53 ×	.9615 ×	.9913 =	8.18.....	.9531
34.....	8.75 ×	.9246 ×	.9824 =	7.95.....	.9083
35.....	8.93 ×	.8890 ×	.9735 =	7.73.....	.8654
36.....	9.12 ×	.8548 ×	.9644 =	7.52.....	.8244
37.....	9.31 ×	.8219 ×	.9553 =	7.31.....	.7852
38.....	9.53 ×	.7908 ×	.9460 =	7.13.....	.7477
39.....	961.54 ×	.7599 ×	.9367 =	684.41.....	.7113
				738.64	6.7959

The first premium, being paid in advance, is a certainty, which is expressed by a unit. The chance of the person being alive to pay the second premium is expressed by the ratio of those living at 33 to those living at 32 (see actuaries' table), or  $\frac{84089}{84381} = .9913$ . So the chance of the person being alive at 34 to pay the third premium is expressed by  $\frac{88389}{84381} = .9824$ ; and so on. Now the present value of any future payment can only be such part of its present value as discounted at the assumed rate of interest, as those living to that age are of those living at the start. For example, the

long to remedy. His remedy is, so to invest the self-insurance or "how much in deposit" part of the funds, that no policy holder's share of it can be used by the company to pay expenses or any death claim but his own. The same is the object of American laws prescribing a fixed standard of reserve and net valuation. But it is in its bearing on short endowment insurance, or that which never extends beyond 75, that the distinction between insurance and self-insurance becomes vitally important; and the present decay and unpopularity of that branch of the business, which flourished so marvellously from 1858 to 1869, must be attributed to its being wholly ignored up to the latter date. This great practical mistake seems to have arisen from an unfortunate, though not incorrect, definition or analysis of the endowment insurance policy, the effect of which is described as follows in the "Insurance Times" for November, 1873:

"Endowment insurance is commonly defined as the union of insurance with endowment in the same policy. If the endowment is of the same amount as the insurance, as is almost invariably the fact, and for the same term, then the whole policy may be and commonly is regarded as the union of a simple term insurance with a pure endowment for the same term. If the life contingency, or risk of death, is considered as a positive quantity in the former, it is a negative quantity in the latter. This means that if the company loses by the death during the term in the former case, it gains by it in the latter. According to this commonly accepted definition, this very useful policy, which provides for one's dependents in case of his own death, and for his own old age in case of his survival, is analyzed into two, both of which are affected by the law of mortality in contrary senses. The more you analyze in this way, the more people not well versed in algebra are mystified; for no other language than algebra has power to deal satisfactorily with positive and negative quantities in the same calculation. By a different analysis the negative quantities will all disappear. If, instead of regarding the policy as composed of the insurance of a given invariable amount for a term of years, united with an endowment of the same amount at the end of the term in case of survival, we regard it as the insurance of a decreasing series of sums, united to an increasing accumulation, the amount of which latter at any period of the term, added to the sum then insured, shall equal the face of the policy, we shall have precisely the same thing as before, with the contingency, so far as the company is concerned all on one side. The "endowment" in a technical sense is annihilated. We have in its stead a mere series of savings-bank deposits, subject to certain peculiar conditions, or, in other words, a series of self-insurances, supplementary to the series of yearly insurances done by the company. Without affecting the practical results at all, we have got a new point of view from which the whole matter is as plain as insurance for a single year."

Had the companies regarded the increase of the net premiums of the endowment insurance policies over those of the ordinary life policies, not as insurance premium at all, but mere self-insurance or savings-bank deposit, they would have abstained from doing two or three very unfortunate things. They would not have added more margin to the net endowment premiums than to the smaller net life premiums, but rather less. They would not, whatever the premium might be, have paid more to procure a given amount of short-term endowment insurance than of long, but rather less. They would not have assessed more for expenses on a given amount of short endowment insurance than of long, if as much. The consequence of paying the agent no more, if not less, for bringing in \$100 of endowment

insurance premium, than for bringing in \$25 of life premium, would doubtless have been a slower growth of this branch of the business. But, if there had been less of it, and less overloading and over-assessment, it would not now be showing signs of wasting away. The force of these remarks cannot be fully appreciated without recurring to the elementary principles, and perceiving how the commuted premium operates from the start. After once finding it, no matter whether it be single, limited annual, or annual during the term, the effect on the company's risk, and the reserve that must be on hand at the end of each succeeding year, can be very readily ascertained by means of the tables already given. Take for example the net annual premium for 32; death or 40, to insure \$1,000, which we find to be \$108 69. The claim being payable at the end of the year, if only the natural premium is paid at 32 for \$1,000, and a claim occurs on the policy the first year, the co-insurers will have to pay \$991 25; if \$108 69 is paid, they will have to pay only \$886 96. Hence, in this

latter case the company insures only  $\frac{886.96}{991.25}$  of

the face of the policy; the rest the person insures himself, and it should therefore cost him

normally, in advance, only  $\frac{886.96}{991.25} \times \$841$ , to

pay for carrying the risk, or \$7 52. (See table No. 1.) Deducting this from the net premium, we have \$101 17 for deposit, which at the end of the year will amount to \$105 21. This is the first year's self-insurance. It will go to make up the \$1,000 if the policy turns up a claim; otherwise it must be on hand, for a reason that will be plain enough at the end of eight years. All that this policy contributes the first year to death claims, if the person does not die himself, is \$7 52 (or \$7 52 $\frac{1}{2}$ , to be exact), instead of the natural premium of \$8 41. The other 88 $\frac{1}{2}$  cents is accounted for as the normal cost of the self-insurance, at the rate of \$8 41 per \$1,000. In the same way, for the next year, adding the net premium to the reserve and accumulating at 4 per cent., we find the co-insurers will pay in case of death \$777 54, instead of the \$991 08 they would have paid if the natural premium only had been paid. Hence the year's risk costs  $\frac{777.54}{991.08} \times \$858 = \$673$ ; and the deposit is \$101 96, which added to \$105 21, and increased by the interest, makes the self-insurance of the second year \$215 45. In this way columns B, E, and F, in table No. 1, are completed, columns B and E being simply the analysis of the net premium. The same is true of the same columns in No. 2, where the first eight years of a long endowment insurance, entered at the same age, are given. It is plain that if a dollar were borrowed out of the deposits, or reserve, in columns E and F (No. 1), it must be returned with interest, or the company would not be able to pay the \$1,000 to the person himself on

his reaching 40. The only insurance resources are columns A and B, and these ought to be abundantly sufficient both for the claims and expenses of that branch of the business. The extra interest over 4 per cent. of the self-insu-

rance part will suffice for its own expenses, and should generally return some surplus. But the company must be ill managed or ill constructed which draws upon it for the expenses and claims of the insurance part.

No. 1.—DEATH OR 40.

Gross Premium, \$182 60. Net Premium, \$108 69.

AGE.	INSURANCE.				SELF-INSURANCE.	
	A Margin, or "loading."	B Normal cost of insurance.	C Risk.	D Insurance value.	E Deposits.	F Reserve at end of each year.
32.....	\$23 91	\$7 52	\$394 79	\$29 80	\$101 17	.....
33.....	23 91	6 73	784 55	23 87	101 96	\$105 21
34.....	23 91	5 85	668 98	17 47	102 84	215 45
35.....	23 91	4 89	547 79	12 18	103 80	331 02
36.....	23 91	3 84	420 66	7 66	104 85	452 21
37.....	23 91	2 67	287 22	4 01	106 02	579 84
38.....	23 91	1 40	147 15	1 40	107 29	712 78
39.....	23 91	0 00	0 00	0 00	108 69	852 85
40.....	.....	.....	.....	.....	.....	1000 00

No. 2.—DEATH OR 75.

Gross Premium, \$26 67. Net Premium, \$19 05.

32.....	\$7 62	\$8 32	\$968 84	\$174 70	\$10 73	.....
33.....	7 62	8 38	977 30	174 60	10 67	\$11 16
34.....	7 62	8 44	965 34	174 40	10 61	22 70
35.....	7 62	8 52	952 99	174 15	10 53	34 66
36.....	7 62	8 58	940 21	173 88	10 47	47 01
37.....	7 62	8 64	927 01	173 59	10 41	59 79
38.....	7 62	8 70	913 32	173 20	10 35	72 99
39.....	7 62	8 76	899 16	172 79	10 29	86 68
40.....	.....	.....	.....	.....	.....	100 84

The "margins" of these two policies (column A) are those usually applied, the first being 22 per cent. of the net premium, and the second 40 per cent. Expenses are usually assessed according to these margins, with what effect will appear presently. Let it be observed that the insurance done by the company (column C) is always the face of the policy less the "self-insurance" of the year. Let us suppose that the holders of No. 1 and No. 2 have lived through eight years. The insurance which the company has done for each is the sum of the numbers in column C against the eight years. For No. 1 it is \$3,751 14; for No. 2 it is \$7,564 17, a little more than double. Supposing the death claims to have been according to the table, and that the expenses have consumed half the margins (not an unusual experience), the insurance enjoyed by No. 1 has cost him the sum of column B plus half that of A = \$128 54; and that by No. 2, \$98 82. That is, at No. 2's rate, No. 1's insurance ought to have cost him only \$49. If No. 2 paid enough, No. 1 paid at least \$79 54 too much. As the policy No. 2 that was to extend beyond the eight years had a much greater interest than the other in having the company enlarged, in proportion to the insurance it enjoyed during the eight years, it would seem it ought to have been assessed for the expenditures devoted to that object in a higher ratio.—This brings us to the question, What is the measure of a member's interest in the company, as an insurance company? Plainly it is not the face

of the policy or the premium, one or both, alone. A person who has a series of larger risks to be carried through 40 years, sick or well, if he should live so long, must have a larger interest than one who has a series of smaller risks to be carried only eight years, though the premium of the latter should be larger and the face of the policy the same. He may have a greater interest in it as a savings bank, and this is measured by the deposits. It is difficult to discover any nearer measure of the interest of a member in the insurance, than the present value of all the insurance contracted to be done under the policy, and this is found by discounting both by interest and mortality all the normal costs in column B. This process, already explained, gives column D, in which is placed against each age, under the head of "Insurance Value," the present value of all the future normal costs, including that just due. The insurance values given in No. 2 include, of course, the discounted normal costs of the 59 years of possible insurance not included in the table.—If the self-insurance fund accumulated on a policy can never be used properly by the company for any purpose but to pay the claim arising on the policy itself, it becomes an important question how far the company can justly appropriate it as a penalty for the non-fulfilment of the contract. The loss which the company will sustain by the non-performance of the contract can have no appreciable relation to the self-insurance or accumulated de-

posits, but only to the insurance that remains to be done, that is, to the present value of it. This grows less while the self-insurance grows greater. Manifestly, then, the penalty for breach of contract should not increase with the age of the policy. It cannot therefore be a fixed percentage of the self-insurance fund, but it may perhaps justly equal or exceed it at first. There is therefore nothing to which it can to any appreciable extent have any just relation but the "insurance value." This principle is just beginning to be recognized by some of the largest offices. The "insurance value" of the policy is also beginning to be recognized as the proper basis for determining the addition to be made to the net premiums for expenses and adverse contingencies. This will have the effect to reduce the premiums on the shorter endowments, if not to increase those on the longer ones. It is also beginning to be seen that the expenses, so far as they exceed those of ordinary trust institutions, should be assessed upon the members, not according to the premiums they pay, or their self-insurance, but according to the value of their interest in the company as an insurance company. Nothing can be more certain than that, as the business has hitherto been managed, it is better to put the difference between the premiums of an endowment insurance policy and a term policy for the same term into an ordinary savings bank, and take only the term policy of the life insurance company. It can only be politic to take the endowment insurance policy when the company's expenses in excess of one half of one per cent. on its investments are assessed on the policy holders according to the then present insurance values of their policies, discounted at an interest as low as 4 per cent. In that case, no one who needs insurance at all can afford to deposit in an ordinary savings bank, but will find it profitable to employ the life insurance office both for insurance and accumulation. Nor, in that case, will the redundancy of the premium be any objection, because it will be sure to return annually with interest. If three things, to wit—1, the normal or tabular cost of carrying the risk of each year; 2, the addition to the net premium made to meet the working expenses and to provide against the possible excess of death claims in any year over the amount expected by the table; and 3, the self-insurance of each year with that part of the net premium devoted to its increase—were all stated distinctly in the policy itself, and also kept distinct in the books of the company, it would probably dispel most of the mystery which has so much bewildered policy holders, and remove the necessity of any more elaborate governmental supervision than that which is exercised over other fiduciary institutions.—The following are the kinds of policies usually issued by life insurance companies. It is to be understood that a claim said to be payable "on the death of the insured" is payable according to the calculation at the end of

the policy year in which he dies; but when the claim is known to be valid, it is usually paid within from 60 to 90 days. A whole-life policy is an agreement on the part of the company to pay a certain sum to those representatives of the insured mentioned therein on his death. About three fourths of all the policies issued are of this kind. A term policy is an agreement to pay to the representatives of the insured a certain sum on his death, provided that event happens within a certain fixed term. A simple endowment policy is an agreement to pay a certain sum to the insured at the end of a fixed term if he be then alive. The insured himself takes the risk of living till the end of the term. Such policies are seldom taken out in this country. An endowment insurance policy is an agreement to pay a certain sum to the insured at the end of a fixed term, or to his representatives on his death should that happen before the end of the term. When "endowment policies" are spoken of, it is this kind which is usually meant. A joint-life policy is an agreement to pay a certain sum on the death of one of two or more persons named. In this and the following kind of policy usually only two persons are named, upon the death of either of whom the policy becomes payable; but three or more may be. A survivorship policy is an agreement to pay a certain sum to the survivor of two persons named on the death of the other. Various other kinds of policies are sometimes issued, especially by English companies; but those mentioned are the only ones issued in this country to any considerable extent. (See ANNUITIES.)—Life insurance is governed by the same legal principles, so far as they are applicable, as other kinds of insurance. (See INSURANCE.) Any fraud or deceit in obtaining a policy, or misrepresentation of essential facts, even innocently made, will render it void. Any person can insure the life of another upon whom he or she is dependent for support, or in the continuance of whose life he has an adequate pecuniary interest; and a wife is always held to have an insurable interest in the life of her husband. At present the policies of companies make specific provision in regard to most points which would be likely to give rise to disputes. As these provisions vary somewhat in different companies, they should be carefully examined and strictly complied with.—Some idea of the magnitude of the business of life insurance may be formed from the following statistics of the New York state companies for the year 1873:

Number of companies .....	27
Number of policies in force .....	885,781
Amount insured .....	\$1,051,099,864
Gross assets .....	180,895,408
Gross liabilities except capital .....	153,516,842
Surplus as regards policy holders .....	22,379,061

If to these amounts we add those of the companies of other states doing business in the state of New York, they will be almost exactly doubled.

**LIFE PRESERVER.** See LIFE BOAT.

**LIGHT**, that force in nature which, acting on the retina, produces the sensation of vision. It also has an important influence upon chemical affinity, as may be instanced in the union of hydrogen and chlorine gases, which in diffused light takes place gradually, but in the direct rays of the sun instantly. The manifestation of vitality in plants is almost entirely dependent upon it, and most animals cannot maintain their health for any considerable time without its presence. The sources of light are self-luminous bodies, such as the sun, the fixed stars, certain meteors, those planets which have not cooled below the point of redness, and terrestrial bodies in a state of incandescence and phosphorescence. The ancient Greeks were aware that rays of light proceeded from illuminated objects in straight lines, which were reflected as well as refracted by surfaces according to certain definite laws. But all the ancient philosophers had very inconsistent notions in regard to its connection with vision, believing this vital function to be performed by something which proceeded from the eye to the object; and it is remarkable that this illogical idea was entertained until the early part of the 11th century, when it was refuted by the Arabian astronomer Alhazen, who seems to have been the first to perceive that vision is produced by rays of light proceeding from the object to the eye.—Two principal theories have been advocated to account for the phenomena of light, the emission or corpuscular theory, and the undulatory theory. The emission theory, which was the first to be connected with optics on mechanical principles, originated with Descartes, who was the founder of modern mechanical philosophy. He conceived light to consist of small particles emitted by luminous bodies, capable like elastic balls of bounding from or being reflected by surfaces; and he explains the production of colors by assuming that a rotary motion is given to these particles under certain circumstances. But Newton was the founder of the emission theory, because he developed nearly all the doctrines by which it was maintained for more than a century, and also discovered many of the laws of optics by its means. The principal distinguishing hypotheses of this theory will be noticed in the course of this article. The undulatory theory assumes that the space between the celestial bodies is occupied by a kind of imponderable matter, which is infinitely elastic and of extreme tenuity, so that it not only occupies the space between bodies, but also enters into them and performs its function of undulation within them and between their particles. This subtle matter is called the luminiferous or cosmic ether (see ETHER), and the luminousness of a body is assumed to be due to a rapid vibratory motion of its molecules which is propagated in the ether in the form of waves. These waves proceed in all directions from every luminous point, resembling in that respect the waves of sound; the luminous

point, like that of the origin of sound, being the centre of a sphere. The waves, however, are propagated in different ways in the two cases. The sphere of sound is formed by alternate expansions and condensations of the air, the waves consisting of concentric shells of alternate density and rarity, and the motion of the aerial particles being to and fro in the direction of the radii of the sphere. In the case of light the propagation is also in the direction of the radii, but the motion of the particles of ether is supposed to be in a transverse direction, as represented in section in fig. 1. The transverse oscillations in a line of ether particles proceeding in a right line from the source of light, as from *c* to *a*, is called a ray, and that length of a ray which at any instant includes all the phases of an oscillation is called a wave; while the form of that part of the wave which is presented toward the direction of propagation is called a wave front. In the figure the vibrations are represented as taking place in one plane. Some regard each ray as cylindrical in form, and made up of a number of transverse vibrations which cross each other like the diameters of a cylinder; but it is only necessary to suppose that each ray vibrates in one plane, and that there are innumerable parallel rays with planes at every inclination to each other, as well as rays crossing each other in all directions. The velocity of light is known to be about a million times as great as that of sound, so that upon the undulatory theory air, or any other ponderable form of matter with which we are acquainted, would not be a sufficiently subtle medium for its propagation. For the purpose of explanation it therefore becomes necessary to assume some other medium which possesses adequate mechanical properties. Such a medium had been imagined by the ancients, and Hooke in 1664 proposed a theory that "light is propagated by a quick, short, and vibratory motion, in a homogeneous medium, in such a way that every pulse or vibration of the luminous body will generate a sphere which will continually increase and grow bigger, as the waves or rings on the surface of water do swell into bigger and bigger circles about a point in it." His theory, however, contained many erroneous hypotheses, and was unsupported by experimental or mathematical proof; but in the hands of Huygens it soon assumed a form capable of explaining most of the phenomena of light in accordance with established mathematical principles, and of standing the test of experimental demonstration to the present time. No better idea of the inception of the undulatory theory

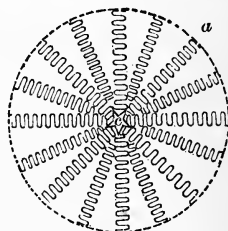


FIG. 1.



can be given than by quoting a few words from Huygens's *Traité de la lumière* (1690; *Tractatus de Lumine*, 1728). It will also thus be seen that he had formed views in regard to molecular physics which have but recently been adopted, and that he had a pretty clear idea of the doctrine of dissociation almost a century and a half before the birth of Sainte-Claire-Deville, its commonly reputed author. "No one will question," says Huygens, "but that light consists of a motion of a certain matter as regards its effects. It appears that light, when gathered into a focus by a concave mirror, has the property of burning like fire, that is to say, it dissociates the particles of bodies (*quod disjungat partes corporum*); and this most certainly indicates motion, at least according to that philosophy wherein the causes of all natural effects are conceived by means of mechanical reasons. . . . If we consider with what great velocity the rays of light are propagated on all sides, and how, setting out from various and even opposite quarters, they intersect without interfering with one another, we will easily understand that lucid bodies are not seen by means of a certain luminous matter coming from them to us, as a ball or an arrow passes through the air. . . . It therefore moves in another way, and to understand this it will be well to know how sound passes through the air." He then gives the explanation of the propagation of sound in a manner scarcely equalled by any modern writer, and proceeds: "There is no doubt but that light reaches us from luminous bodies by means of motion given to the interposed matter. . . . Light and sound, though they possess successive motion in common, yet differ very widely in other respects, as the motion which is the cause of each is differently produced, and the matter is different in which the motion takes place, and the mode different whereby the motion is communicated. For sound has for its cause a sudden concussion of the whole body, or of a large part of it, which puts the contiguous air in motion; but light must arise from the separate parts of the luminous body, so that they are all plainly seen. . . . In luminous bodies the motion is produced by a violent concussion of the particles, whereby an impulse is given to the ethereal matter. If we now inquire what is that ethereal matter wherein that motion springs, it will be seen that it is not the same as that which serves for the propagation of sound; for this is no other than the air we breathe, which being removed, the other still remains, a fact proved by placing the sonorous body in a glass vessel and removing the air by Boyle's machine." It is sometimes said that Huygens entertained the idea that light was propagated in the luminiferous ether in the same manner that sound is in the air, that is, by to and fro vibrations in the line of propagation; but according to the above quotation, and for other reasons, this conclusion is scarcely well founded. He does indeed compare the

action to that which accompanies the impact of elastic bodies, but does not suggest any definite method of production of the vibrations. He concerns himself more with the forms of the wave fronts which are produced by the vibrations, and in that way arrives at mathematical results which, by the most rigid experimental and theoretical tests, have been found true. The composition of light by the union of rays of different degrees of refrangibility was not then known, and the cause of this difference of refrangibility not till more than a century after; several other of the phenomena of light, as interference and diffraction, had not been well observed, and required some additional hypotheses for their explanation; but the fundamental principles which enter into the explanation of all the phenomena, then as well as recently observed, were laid down by him, and will never be affected by any changes of hypothesis in regard to the precise mode of motion of the individual particles of ether. The additional hypotheses by which the theory has been brought to more completeness, the most important of which is that of transverse vibrations and the deduced principle of interference, were proposed (1801-'3) by Dr. Thomas Young of England, and hence many of his countrymen regard him as really the founder of the undulatory theory. The principle of interference, however, was not perfectly established and generally applied until Fresnel brought to bear upon the subject the analytical powers of his great mathematical genius. Euler, Malus, Cauchy, Arago, Biot, Sir David Brewster, Sir William Hamilton, Sir G. B. Airy, and other investigators have also added many important contributions. The definite conception of transverse vibrations of different lengths by which the rays of different refrangibility were propagated must, however, be considered as an important part of the undulatory theory as it now stands, and the principal hypothesis upon which a great share of the physical explanations depends. It may seem remarkable that this theory, whose fundamental laws were so clearly stated nearly two centuries ago, should not have been sooner accepted, as it is thought the emission theory can be put to the test of direct experiment. Experiments made by Mr. Bennett are pointed to as being conclusive. He suspended a slender straw horizontally by means of a spider's web, and attached a piece of white paper to one end of the delicate balance. He then introduced it into the receiver of an air pump, exhausted the air, and brought the focus of a powerful lens to bear upon it, but without producing any motion in the ponderable matter of the balance. It is asserted that on the emission theory the immense velocity of the luminous particles, although they might be infinitesimally small, would possess sufficient momentum to impart a sensible degree of motion to light bodies; and the position cannot well be denied. If a single molecule of light

weighed  $\frac{1}{2400}$  of a grain, it would have a momentum equal to that of an ounce ball moving with a velocity of 1,000 ft. a second; and if it be assumed that the light molecules are many millions of times lighter than this, it may also be assumed that as many millions of molecules may be made to act together. It may be answered, on the other hand, that if the luminiferous ether is composed of particles so small as to be able to easily pass between the particles of ponderable matter, as some suppose they do, they have not the power to impart momentum. But this position fails when we consider the immensely greater velocity of light than that of any ponderable bodies that are supposed to be traversed by the ethereal particles in consequence of the motion of such ponderable bodies. It must be admitted, however, that the experiments of Mr. Bennett, although they add difficulty to the emission theory, do not amount to a demonstration; that is, after all, more nearly reached by the perfect competency of the undulatory theory to explain all the various phenomena of radiation. But the velocity and momentum of the luminous particles are held to be no greater objection to the emission theory than that offered by the fact that the velocity of light in a homogeneous medium is uniform; which, it is maintained, could not be the case if the luminous particles were emitted by the force of the self-luminous body, which must be admitted to be a variable force.—*Velocity of Light.* The velocity of light is so great that no sensible space of time is occupied in its passage between any two points on the surface of the earth. The first determinations of this velocity were made from observations on the heavenly bodies. Roemer, a Danish astronomer, in 1675 made the first estimation by means of observations on the eclipses of Jupiter's first satellite. This body passes into the planet's shadow at equal intervals of 42 h. 28 m. 36 s. Let  $m$ , fig. 2, represent the satellite,  $e$  and  $e'$  the earth, and  $S$  the sun. When the earth is travelling in that part of its orbit between  $a$  and  $b$ , the distance between it and the satellite varies but little, and therefore the intervals between successive occultations do not sensi-

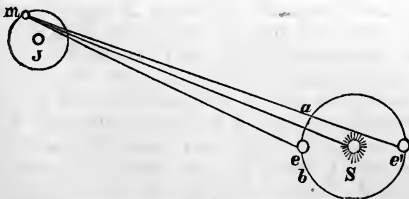


FIG. 2.—Roemer's Observations.

bly change; but when the earth has reached the opposite part of its orbit, as at  $e'$ , a retardation has taken place in all the occultations amounting to about 16 m. 40 s., the precise time varying as the points  $e$  and  $e'$  vary with respect to the elliptical orbit. Calculations from

data furnished in this way show the velocity of light to be about 190,000 m. per second. Another method which has been employed is that of aberration, or an apparent change in the position of the fixed stars, caused conjointly by the velocity of light coming from them and that of the earth in its orbit. (See *ABERRATION.*) The velocity of light has also been determined by observations upon distances between places on the surface of the earth, machinery being used to mark the otherwise insensible periods of time. In 1849 M. Fizeau measured the time it took for light to travel from Suresnes to Montmartre and back again. A toothed wheel, having the teeth and the intervals between them of equal width, is made to revolve rapidly in a plane at right angles to a beam of light, with such a velocity that the beam, having passed through an interval, and having been reflected back by a mirror placed at the other station, will be intercepted by a tooth which has in the mean time taken the place of the interval. The main apparatus was placed at Suresnes and the mirror at Montmartre, a distance of 28,516 ft. With a certain velocity of the wheel the beam of light would be intercepted and no reflection observed; with twice the velocity it would reappear; and with three times the velocity it would again be obscured. The velocity of light deduced from recent observations with this apparatus is 185,000 m. a second, which accords pretty closely with results of astronomical observations. Another method only requires a distance of less than 12 ft., and employs the principle of the revolving mirror first used by Wheatstone in his experiments on the duration of the electric spark. (See *ELECTRICITY.*) This method was proposed by Arago, and carried out independently by Foucault, Fizeau, and Bréguet. An important feature in the experiment is the passing of a beam of light through a long tube containing a liquid, in which its velocity is found to be retarded; a fact which is strongly confirmatory of the truth of the undulatory theory, one of whose consequences is that light has a greater velocity in air and gases than in liquids, while the emission theory leads to an opposite conclusion.—*Intensity.* The intensity of light may be estimated by an amount which is received on a unit of surface, and depends upon the degree of luminosity, upon the distance from the source, and upon the obliquity to the rays of the surface illuminated. The intensity of light emanating from a point is inversely proportional to the square of the distance. This agrees with a similar law in regard to heat, and is proved by considering the internal surfaces of two spheres to be illuminated from points at the centre. If the sources of light are equal to the surfaces, they will each receive the same amount of light; but if one has a radius twice as great as the other, it will have four times the area, and therefore an equal area would receive only one fourth as much

light. In regard to the effect resulting from obliquity of the receiving surface, the law is that the intensity of light received is proportional to the cosine of the angle which the incident rays make with a perpendicular to the surface. Let  $a b$ , fig. 3, be a surface receiving

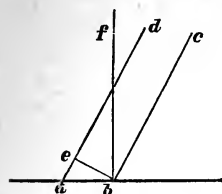


FIG. 3.

a beam of parallel rays,  $c b a d$ . The quantity of light falling on  $a b$  will be the same as that which would fall upon a surface  $e b$ , perpendicular to  $c b$  and  $d e$ ; therefore the intensity of light received by these surfaces is inversely proportional to their areas. But  $e b = a b \times \cos. a b e = a b \times \cos. c b f$ , the angle included between the incident rays and the perpendicular to the surface. The same law has been applied to heat, and is true as to the number of rays falling upon the surface, but not strictly so as to the amount of heat absorbed. (See HEAT.) The intensity of light emitted from a luminous surface obeys the same law. For the comparison of the intensity of different sources of light, see PHOTOMETRY.—*Absorption and Emission.* In regard to the properties of bodies by which they allow light to be transmitted through them, or cause its absorption, they are classified as transparent, translucent, and opaque. Transparent bodies are those which transmit light with little or no perceptible loss, and through which objects may be distinguished. Translucent bodies allow much of the light to pass through them, but prevent objects from being viewed through them, such as ground glass, oiled paper, and horn. Opaque bodies are those which absorb the rays of light, or prevent most of them from passing through them. These properties of bodies depend upon their molecular constitution. Some bodies have the power of transmitting the non-luminous but not the luminous rays of the spectrum; such are called diathermanous bodies. (See DIATHERMANOUS.) Dry air and rock salt are bodies that are almost perfectly transparent as well as diathermanous; or, as it is sometimes said, transparent to all the rays, visible and invisible. Rock salt is the only known solid having this property nearly perfect. Those bodies which permit the ether within them to transmit undulations of medium wave length from and to the ether around them are transparent to the luminous rays; those whose molecular constitution causes the ether undulations to be broken up are opaque. There are no bodies which are perfectly opaque, as is shown by cutting them in very thin slices, or hammering them into thin films, when most of them will be found slightly translucent. Foucault has coated the object glass of a telescope with so thin a film of silver that the sun can be viewed through it.—*Reflection and Refraction.* When

a beam of light meets the surface of a new medium, a portion of it is always turned back or reflected, while another portion is propagated onward in the second medium, and is also turned out of its original course, or refracted. The angles which are made by the incident and reflected rays with a perpendicular to the surface are called the angles of incidence and reflection respectively, and are always equal to each other. Light is said to be regularly and irregularly reflected. The image formed in a mirror is regularly reflected, but the rougher surfaces of ordinary objects reflect light irregularly in all directions without forming an image. The intensity of reflected light varies with the reflecting surface and with its position. The differences also in the reflecting powers of different substances are greater for small than for large angles of incidence. Thus water reflects only  $\frac{1}{10}$  part of a perpendicular beam, while mercury reflects two thirds; but when the incident angle is  $89\frac{1}{2}^\circ$ , they each reflect  $\frac{1000}{10000}$  of the incident light. The refracted rays are deflected in a direction either to or from the perpendicular, depending upon the refracting power of the second medium. When its refracting power is greater, the direction is toward the perpendicular, and when it is less, from it. Ptolemy measured the refraction of glass and water at various angles, and he observed that the angle of incidence was greater than the angle of refraction; but he erred in supposing the proportion to be invariable for different angles, it being left for Willebrord Snell, about 1621, to demonstrate that in refraction there is an exact proportion between the sines of the angles of incidence and refraction, instead of between the angles themselves. Alhazen had long before shown that the angles vary as the incident rays are more or less oblique, but failed to discover the natural law. Alhazen's discovery, however, had not prevented mathematicians from generally adhering to the old notion of Ptolemy down to the time of Kepler, who again saw the error, and published an approximate correction in 1604. The laws of single refraction may be stated as follows: 1. At any angle of incidence the ratio of the sines of the angles of incidence and refraction is constant for the same two media, but varies with different media, and this ratio is called the index of refraction. 2. The incident and the refracted rays are in the same plane, which is perpendicular to the plane separating the two media. These have been generally known as Descartes's laws, but, as stated above, their discovery is due to Willebrord Snell. The index of refraction, as will be seen further on, also varies somewhat with the nature of the light, whether red, green, or violet; and in exact experiments homogeneous light alone is used, but this does not affect the general law. The index of refraction from air to water is  $\frac{4}{3}$ , and is called the index of refraction for water. In calculating the indices of refraction for me-

dia generally, air is considered as the first medium. The indices of refraction for various substances are given in the following table, and are calculated for yellow light, except those marked \*, which are for extreme red:

TABLE OF INDICES OF REFRACTION.

SUBSTANCE.	Ind. of refr.	SUBSTANCE.	Ind. of refr.
Crown glass .....	1.534	Ruby .....	1.779
Flint glass.....	1.570	Feldspar.....	1.764
Rock crystal*..	1.547	Tourmaline .....	1.683
Rock salt.....	1.545	Diamond.....	2.500
Canada balsam..	1.582	Phosphorus.....	2.224
Sugar*.....	1.585	Sulphide of carbon	1.673
Spermaceti.....	1.503	Linseed oil*.....	1.455
Borax.....	1.475	Olive oil.....	1.470
Alum*.....	1.457	Oil of turpentine*	1.470
Fluor spar.....	1.436	Alcohol.....	1.372
Emerald.....	1.565	Ether.....	1.358

The phenomena of reflection and refraction are explained on the emission theory by supposing that the projected luminous particles and the particles of bodies exert a mutual action, either repulsive or attractive. In certain positions the particles of light are supposed to be repelled, and therefore reflected; in other positions they are attracted, and therefore pass into the medium and are refracted. In the wave theory it is supposed that when a wave of light reaches the surface of a second medium whose elasticity is different, it gives rise to two waves, one in each medium, both differing in position from the original wave. But the several portions of the incident wave will reach the surface at different moments of time, and each of these portions will be the centre of two new waves, one of which will be propagated in the first medium with the velocity of the incident ray, and the other in the second medium with a velocity depending on the density of the ethereal particles within it; so that an infinite number of partial waves will be reflected and refracted, forming by their union grand or primary wave fronts at right angles with the reflected or refracted rays. The following is a condensation of the elegant demonstration of Huygens. Let  $a e$ , fig. 4, be the front of a plane wave meeting the reflecting surface at  $a$ . As each portion of this wave reaches the surface, it becomes the centre of a spherical wave in the first medium having the same velocity. Therefore, when the portion  $e$  has reached the surface at  $c$ , the portion  $a$  will have formed a spherical wave whose radius  $a m$  is equal to  $e c$ , and the portion  $b$  will also have formed a wave whose radius  $b o$

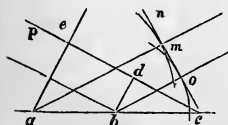


FIG. 4.

is equal to  $\bar{d} c$ . The surface  $n m c$ , which touches all these partial wave fronts, is the front of the reflected wave; but since  $a e$  and  $b o$  are proportional to  $a c$  and  $\bar{b} c$ , it follows that this surface is plane; and furthermore, since  $a m = e c$ , and the angles at  $e$  and  $m$  are right angles,

the angles  $e a c$  and  $m c a$  are equal, or the incident and reflected wave fronts (and therefore the rays) are equally inclined to the reflecting surface. The demonstration of the law of refraction is similar. If  $a e$ , fig. 5, is the front of a plane wave, when the portion  $a$  reaches the surface a partial wave is generated, which will proceed a certain distance, while the portion  $e$  passes on to  $c$ , and the portion  $g$  will arrive at  $b$ , where a partial wave is also generated, with the same velocity as that formed at  $a$ .

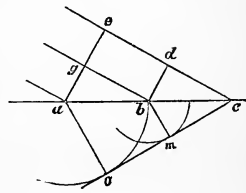


FIG. 5.

As these partial waves form a plane wave front in the refracting medium, their direction must be such that they will reach the plane  $e n$  in the same time that the portions  $g$  and  $e$  reach  $b$  and  $c$  respectively; and as  $\sin e a c : \sin a c o :: e c : a o$  (the angles at  $e$  and  $o$  being right angles), it follows that the sines of the angles are in the constant ratio of the velocities of propagation in the two media. The composition of the primary wave by the union of the several secondary waves in this demonstration has been called the "principle of Huygens," and is frequently employed in explaining many of the phenomena of light. Refraction produces some well known effects. When an object immersed in water is viewed obliquely, it appears nearer the surface than it really is, because the light in passing from the denser to the rarer medium, or to that whose refractive index is the less, takes a direction from the perpendicular, or more inclined to a horizontal direction. When a ray of light enters a less refracting medium, there is always a value of the angle  $H O B$ , fig. 6, which causes the angle of refraction  $A O C$  to be a right angle. If the angle of incidence  $H O B$  is increased, as to  $E O B$ , the ray cannot emerge from the first medium, but will be reflected from its internal surface. The angle  $H O B$  is therefore called the critical angle, and its sine is the reciprocal of the index of refraction of the medium.

From water to air this critical angle is  $48^{\circ} 35'$ , and from glass to air it ranges from  $38^{\circ}$  to  $42^{\circ}$ . From the diamond to air it is only  $24^{\circ}$ , leaving a range of  $66^{\circ}$  in which reflection takes place from the internal surfaces of the faces of the crystal; to which circumstance this gem owes its brilliancy and splendid play of colors. The phenomenon of mirage depends upon the unequal refractive powers of the different strata of the atmosphere in consequence of the different quantities of vapor which they

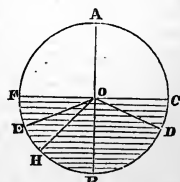


FIG. 6.

contain. (See MIRAGE.) The phenomena of reflection and refraction, such as the formation of images, the production of caustics by means of lenses, and mirrors, are treated in the article OPTICS.—*Dispersion.* Thus far light has been considered as homogeneous, that is, composed of rays having the same wave length; but most of the light with which we are acquainted is compound, consisting of innumerable rays of different degrees of refrangibility, a discovery which we owe to Newton. If a beam of solar light is received into a darkened chamber through a small circular aperture at D, fig. 7, it will produce a luminous spot upon a screen at F, and the diameter of the image will be equal to that of the aperture. If the light is passed through a prism, A B C, placed horizontally, the rays will all be bent toward the base of the prism, but not in an equal degree. Upon the screen M N there will be depicted an elongated spectrum, of a width equal to that of the diameter of the original beam, and composed of innumerable rays of different degrees of refrangibility, and of an infinity of tints, of which seven principal ones are capable of being distinguished by the human

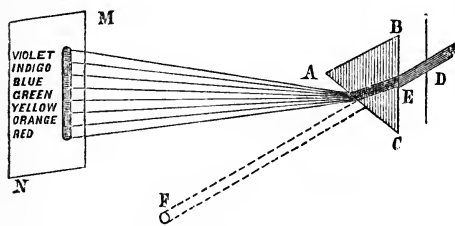


FIG. 7.—Solar Spectrum.

eye, viz., violet, indigo, blue, green, yellow, orange, and red, the violet being refracted the most and the red the least. They do not all occupy an equal space, the violet having the greatest and the orange the least extent. Newton proved that white light is composed of these various colors, not only by decomposing it, but also by recombining the colored rays and reproducing white light. He also showed that the rays in each portion of the spectrum always retain their characteristic color when isolated and passed singly through prisms, and that they will not be dispersed as in the case of white light. According to the theory of Young, which has lately been ably supported by Helmholtz, color results from the impression made by rays of different refrangibility upon three kinds of nerve elements in the retina, one of which alone is impressed by red, another by green, and another by violet light. When these nerves are simultaneously impressed by varying quantities of rays of different degrees of refrangibility, the sensation of a variety of tints is the result. According to the wave theory, the intensity of light depends upon the amplitude of the vibrations, that is to say, upon the distance the ether particles travel

and which is in a direction perpendicular to the time of propagation. The color of a ray, which varies with its refrangibility, depends upon the wave length, that is, upon the distance of the wave crests from each other, in the direction of the line of propagation. The solar beam also contains invisible rays of different wave lengths. When the rays in the beam are dispersed by a prism, these invisible rays are also dispersed, those which are the most refrangible being found beyond the violet, and those which are the least refrangible beyond the red. The most refrangible invisible rays are called actinic, and the least refrangible calorific or heat rays. That portion of the spectrum which is visible is also illuminated in different degrees in different parts, the greatest proportion of light being in that part corresponding to the yellow rays. According to Fraunhofer, the amount of light contained in each part of the spectrum is as follows: red, 94; orange, 640; yellow, 1,000; green, 480; blue, 168; indigo, 31; violet, 6. All the rays possess the property of more or less affecting the temperature of bodies on which they impinge, but those of a certain degree of refrangibility possess it in a far greater degree than the others. When a diathermanous substance, as rock salt, is used as the dispersing medium, by far the greatest amount of heat is contained in that part of the spectrum which lies beyond the red. The violet rays have the power of exciting a faint degree of heat, and the actinic rays are not totally devoid of it; and all the rays possess more or less actinic power, but the least refrangible only in an extremely small degree. The rays which produce vision, however, have a limited degree of refrangibility, and in the spectrum lie within certain bounds. They have relation to a vital function, and are therefore confined to those whose wave lengths are capable of exciting the nerves of vision. Newton supposed the spectrum to be continuous, but it has been found on careful examination to be interrupted by certain dark bands or lines representing vacant spaces, which have fixed positions. A prism of low dispersive power does not exhibit these lines, because the colors are superimposed; but when a succession of prisms is used, the spectrum is lengthened out, so that they are easily seen and their places noted. When the refracting substance is varied, the dark lines may have their positions with regard to one another changed; but with regard to the colors they are not changed, the refracting substance having the same effect upon the extent of the colors that it has upon the position of the lines. A diffraction grating, as will be seen further on, may be advantageously substituted for a prism for the purpose of showing the position and counting the number of the lines. The vacant spaces or lines are caused by the absorption of rays given out by the incandescent body in some part of their passage to the eye. It has been found that the



vapor of a substance has the power of absorbing rays which that substance in a state of incandescence emits; so that, there being in the solar atmosphere vapors of various incandescent bodies, some of the rays originating in the incandescent mass are absorbed, leaving dark lines in their places. These dark lines, having a definite position with regard to the refrangibility of rays, are employed as a means of marking the wave lengths of the different rays. The following table gives the lengths of undulations in parts of an inch, and also the number of undulations performed in a second, corresponding to the different dark lines and other places in the spectrum, as computed by Fraunhofer :

PLACE IN SPECTRUM.	Length of undulations.	No. of undulations per second.
Line B.....	•00002708	451,000,000,000,000
Line C.....	•00002553	473,000,000,000,000
Middle red.....	•00002441	500,000,000,000,000
Line D.....	•00002319	527,000,000,000,000
Middle orange.....	•00002295	552,000,000,000,000
Middle yellow.....	•00002172	562,000,000,000,000
Line E.....	•00002072	580,000,000,000,000
Middle green.....	•00002016	606,000,000,000,000
Line F.....	•00001906	641,000,000,000,000
Middle blue.....	•00001870	653,000,000,000,000
Middle indigo.....	•00001763	691,000,000,000,000
Line G.....	•00001639	723,000,000,000,000
Middle violet.....	•00001605	733,000,000,000,000
Line H.....	•00001547	759,000,000,000,000

Several of these dark lines were first observed by Wollaston in 1802; but as they have since been more completely studied by Fraunhofer, they are called Fraunhofer's lines. He counted over 600 of them, and assigned fixed positions to 354. He selected seven of these as standards of comparison, designating them by the letters B, C, D, E, F, G, H, of which some are single, some are double, and others composed of a group of fine lines, as at E. Sir David Brewster counted about 2,000, and since then Kirchhoff, Bunsen, and others have extended the number to more than 3,000. In other kinds of light, as that of the fixed stars, flames, and the electric spark, analysis discovers similar bands, but differing in position and magnitude, so that each species of light has its own system of bands, which are distinct physical characteristics. The subject will be treated in the article SPECTRUM ANALYSIS.—*Double Refraction.* In what has thus far been said about refraction it has been supposed to take place in one direction only for the same medium and the same angle of incidence; but this is not true for the majority of refracting media, but only of those having a homogeneous or a crystalline structure alike in all directions. Liquids, annealed glass, and crystals whose fundamental form is the cube, possess only the property of single refraction. All transparent substances of regular form, in which there is an unequal state of compression or cohesion of molecules, possess the property of refracting a beam of light in two directions. Such are crystals of the dimetric and hexagonal systems, and glass

which is subjected to unequal pressure in different directions. There is one direction, called the optic axis, in which a beam of light is not divided by these crystals, and this is also the crystallographic axis. They are therefore called uniaxial crystals. Some crystals have two optical axes, or axes through which there is no double refraction. Such belong to the trimetric, monoclinic, and triclinic systems of crystallization, and are called biaxial crystals. The phenomenon of double refraction was first discovered by Erasmus Bartholinus, a Danish philosopher, in Iceland spar, and his account was published in 1669. A few years afterward the subject was investigated by Huygens, who succeeded in establishing the general laws under which double refraction takes place. Iceland spar, which possesses the property of double refraction in the most remarkable degree, is a variety of carbonate of lime, which substance crystallizes in a great variety of forms, all of which may be reduced by cleavage to the rhombohedron. If a transparent crystal of the spar be laid upon a printed page, all the letters seen through it will appear double, but of less depth of color, except where the images overlap. (See fig. 8.) If a line be



FIG. 8.—Double Refraction.

drawn from one of the solid angles in which three of the obtuse plane angles meet, this line, or any line parallel to it, will be the optic axis of the crystal, which is a direction, and not a particular line. See fig. 9, where *a b*, or any line parallel to it, is the optical axis. A ray of light entering the crystal in the direction of any of these lines will not be divided by refraction, but in any other direction it will be split into two rays separated by an angle of  $6^{\circ} 12'$ , one of which was called by Huygens the ordinary, and the other the extraordinary ray; and these possess remarkable properties, as we shall see further on. If a crystal of the spar is laid upon its side over a dot, and rotated on an axis perpendicular to the surface on which it lies, one of the images of the dot (the ordinary image) will remain stationary, while the other (the extraordinary) will revolve around it. A line drawn between the two images is always in the direction of the shorter

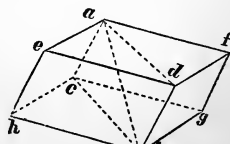


FIG. 9.

diagonal of the face of the crystal, supposing its edges to be of equal length. The ordinary ray follows the law of sines as in single refraction, but the extraordinary ray does not, except when the plane of incidence is perpendicular to the axis of the crystal; in which

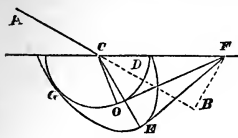


Fig. 10.

case, however, the indices of refraction differ, the ordinary index being 1.66, while the extraordinary is 1.52. Huygens's explanation of double refraction is contained in the fifth chapter of the *Tractatus de Lumine*, and one of the remarkable geometrical constructions contained in it may be briefly stated as follows: Let A C, fig. 10, be the incident ray, and CF the surface of the crystal. Produce AC to B, and draw BF perpendicular to it, meeting the surface in F. Let  $CD : CB :: \text{sine of refraction} : \text{sine of incidence of the ordinary ray}$ ; and from the centre C, with a radius CD, describe the spherical surface DOG. Describe the spheroid of revolution GE with the same centre, its axis of revolution being in the direction of the optic axis of the crystal and equal to the diameter of the sphere, the other axis being greater in the ratio of the ordinary to the extraordinary index. If from a line perpendicular to the plane of the diagram at F tangent planes FO and FE be drawn to the sphere and spheroid, the lines CO and CE drawn from the centre to the points of contact will be the directions of the ordinary and extraordinary rays. In Iceland spar and many other crystals the index of refraction of the extraordinary is less than that of the ordinary ray, but there are other crystals which refract the extraordinary ray the most. The class of crystals to which Iceland spar belongs are called negative, while those which refract the extraordinary ray the most are called positive crystals, both classes being uniaxial. The following is a list of double-refracting crystals: negative uniaxial crystals—Iceland spar, sphatose iron, tourmaline, sapphire, ruby, emerald, apatite, pyromorphite, ferrocyanide of potassium; positive uniaxial crystals—zircon, quartz, apophyllite, titanite, boracite, ice; biaxial crystals—nitrate of potash, sulphate of iron, sulphate of barium, Brazilian topaz, sugar, selenite, aragonite, strontianite, kyanite, epidote, mica.—*Interference*. The important principle now known under the name of interference of light was first proposed by Dr. Thomas Young more than half a century ago. This class of phenomena result from the mutual interference of waves of light when they proceed from two neighboring sources and meet each other under a very small angle, and may be shown by the experiment of Grimaldi, which is described further on in connection with diffraction. The experiment of

Grimaldi is not however satisfactory, as interference takes place in consequence of diffraction from the action of the edge of the aperture. Young modified the experiment so far as to afford him the means of establishing the law of interference, but it was not freed from the objections which might be urged, that the effects were also produced, as in Grimaldi's experiment, by the edge of the aperture. Fresnel afterward made the experiment in such a way that interference took place without the possibility of diffraction, and his experiment is regarded as one of the most instructive and elegant in the range of physics, and as a demonstration of the truth of the undulatory theory. He employed two mirrors placed together at a very obtuse angle (a very little less than  $180^\circ$ ), and reflected from their surfaces upon a screen light from the focus of a lens, in such a manner that on reaching the screen some of the undulations of two converging rays should correspond and intensify one another, while others should be separated by half a wave length and destroy one another.—*Diffraction*. A divergence of the rays of light in passing the edge of an opaque body in such a way as to produce interference is called diffraction. The phenomena were first observed and partially explained by Grimaldi, an Italian physicist, and published in a work entitled *Physico-mathesis de Lumine, Coloribus et Iride aliisque Annexis*, in 1665, two years after his death. He noticed that the circle of light formed upon a screen when rays were passed through a minute orifice into a dark chamber was bounded by fringes which extended into the shadow beyond the geometrical projection. Again, admitting light through two small apertures sufficiently near together to cause the pencils of light projected upon a screen to overlap each other, he further observed that although the space occupied by the overlapping was more brightly illuminated, its borders were darkened by bands or fringes to a greater degree than the other parts of the spectrum. From these discoveries was deduced the proposition that light added to light may produce darkness. To observe the phe-

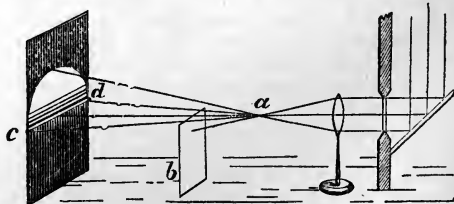


Fig. 11.—Diffraction.

nomena of diffraction with greater advantage than was possible with Grimaldi, who was not aware of the compound nature of light, monochromatic light should be employed. Let a beam of light be received into a dark room, fig. 11, and place a plate of red glass in the

aperture. Pass the homogeneous beam through a convex lens of short focal distance, converging the beam to a physical point at  $a$ , and place an opaque screen  $b$ , having a sharp edge, beyond the focus to intercept the lower portion of the luminous cone, allowing the upper portion to be projected upon a second screen, still further removed. Below the right line  $c d$  the second screen will not be entirely in shadow, but will be faintly illuminated for a short distance, the light gradually passing into obscurity. That portion of the cone which is above the edge of the first screen and which falls upon the second will not be uniformly illuminated, as might be supposed; but there will be an alternate series of light and dark bands, proceeding from the intersection of the line  $c d$ , and extending upward until they gradually disappear. The light and dark bands are not clearly separated, but their edges are more or less blended. If, instead of red, violet light is employed, both dark and light bands, as well as the whole spectrum, will be narrower. Careful observation will also discover that the fringes are not straight lines, but are sensibly curved, the concavity of the curvature being turned downward toward the shadow. By using an eyepiece with a micrometer, Fresnel accurately determined the distances of the bands from the shadows at different points, and found these curves to be hyperbolas. If in this experiment the light proceeds from a source which has any considerable cross section, instead of from a point or a very minute orifice, each line in it parallel to the first screen will tend to produce a different system of fringes, the dark band of one coinciding with the light band of the next, and thus the phenomena of diffraction will not be produced. If, instead of employing an edge, the light is allowed to pass the opposite edges of a very narrow opaque body, as a hair or a fine wire, the phenomena observed by Grimaldi will appear; but the use of monochromatic light will render them more distinct. On each side of the geometrical projection there will appear a set of parallel bands or fringes, like those produced without the geometrical projection by the single edge; but within it, instead of the gradually shaded light, there will also be a series of dark and light bands similar to those outside, only narrower and more clearly marked. These are called the interior fringes, and they also have the form of hyperbolas, but of less curvature. Newton explained the phenomena of diffraction by supposing that the rays of light in passing the edges of bodies are inflected, in consequence of the attraction or repulsion between their particles and the matter composing the edges of the bodies so passed; an explanation similar to that which he offered for reflection and refraction. He supposed that the particles of light in passing the edge of an opaque body are repelled when they arrive at a certain point; and therefore that those passing nearest the edge are inflected the most, and so made

to intersect others less inflected, thus producing a caustic (see OPTICS), within which no rays will pass, and which forms the boundary of the visible shadow. He explained the appearance of the fringes by supposing the attractive and repulsive forces between the particles of each ray and the matter of the edge of the body to alternate, and thus throw them into a serpentine course, the intersections of the rays producing a series of caustics which diminish in intensity from the edge of the shadow. To explain the appearance of the prismatic colors, it was only necessary to apply his theory of the decomposition of white light, which supposes that the various colored rays are unequally attracted by the refracting body through which they pass. That the explanations of Newton are insufficient, aside from other evidence, appears from a consideration of the fact that no difference in the degree of diffraction is produced by increasing the density and therefore the attraction of the matter composing the diffracting edge. The supposition of Mairan and Du Tour that diffraction is caused by refraction of the rays of light in passing through a prismatic film of air condensed by the inflecting body is equally open to objection, for these atmospheric prisms would necessarily vary in form with the nature and density of the body, and would consequently possess different refractive powers. To Young and Fresnel we owe the explanation of the phenomena of diffraction according to the principle of the interference of waves. The formation of the exterior fringes was ascribed by Young to the interference of two portions of light, one of which passes by the body and is slightly deflected, while the other is thrown further out of its course by being obliquely reflected by the edge. The production of the inferior fringes he ascribed to the bending of the waves inward, and the consequent interference which takes place between the rays that intersect each other from the opposite sides. That this latter explanation is correct is shown by the fact that the bands do not appear unless the obstruction is sufficiently narrow to allow rays coming from the opposite sides of the body to intersect each other; when the body is not narrow, the same effect is produced on either side as when a single edge is employed. The explanation of the formation of the exterior fringes, however, does not agree with certain observed facts. Fresnel allowed the rays of light to pass both the back and the edge of a razor, and produced fringes which were alike in breadth and intensity; which could not have been the case if the interference were caused by the reflection of a portion of light by the body, because then there would be a greater condensation by the back than by the edge. Fresnel ascribed the effects to partial or secondary waves, which are separated from the principal wave by meeting an obstacle, and are subdivided into an indefinite number of equal

portions, each portion becoming, according to the principle of Huygens, the centre of a system of partial waves; a theory whose correctness was demonstrated by the agreement which was found to exist between the calculation of the resultant of all the forces, according to the mathematical laws of interference and the intensities of light in the dark and light bands. —*Diffraction Spectrum.* If a piece of glass is ruled with very fine parallel lines, which may be done by a dividing engine and a diamond point, at the rate of from 1,000 to 5,000 or 6,000 to the inch, and it be looked through in the direction of a slit parallel with the grating, a number of spectra will be seen which will be so pure in color as to exhibit several of Fraunhofer's lines. The spectra may be viewed with advantage by employing a telescope; or an image of the slit, which must be highly illuminated, may be thrown upon a screen by a convex lens. Diffraction spectra are of great use in furnishing a uniform standard of reference in the comparison of spectra, and as affording the most accurate method of determining the wave lengths of the different elementary rays of light. Fraunhofer was the first to employ diffraction spectra. The first were made with fine wire stretched between the threads of screws about  $\frac{1}{250}$  of an inch apart. This was comparatively a coarse grating, but he soon ruled lines on glass much closer, and others have since executed them with great nicety. Mr. Rutherford of New York has ruled 12,960 lines to the inch, but finds that for practical purposes about half this number is preferable. —*Colors of Thin Plates; Newton's Rings.* The phenomena known under these names were first examined by Boyle and Hooke, but were afterward more completely investigated by Newton. They are observed in soap bubbles, plates of mica and selenite, and other crystals, in thin plates or films of glass or other transparent substances, or in the films of air held between two transparent plates. Any arrangement by means of which a ray of light may be reflected from two adjacent surfaces, or transmitted through two plates in such a manner as to produce interference of the rays, will exhibit the colors of thin plates. If the mouth of a small cylindrical vessel is dipped into water made viscid with soap, a film will remain across it after its removal, which will exhibit the phenomena of these colors. Holding the film in a vertical position, it will at first, if thick enough, appear white; but growing thinner by evaporation and descent of particles, it will soon present, commencing at the top, a brilliant play of iridescent bands, arranged horizontally. After a while the top of the film loses its color and appears black, and growing thinner bursts. If a drop of oil or of spirits of turpentine is spread over the surface of water, a film of the proper thickness soon forms, which presents the same play of iris colors as the soap bubble. A finely grooved surface, which has the power to re-

fect the rays of light in such a way as to produce interference, will also exhibit the same appearance. Newton examined the subject experimentally by placing a glass plate having a spherically convex surface of great focal length upon a plane glass, and applying a certain degree of pressure. When the system is held toward the light a series of colored rings is observed, whose dimensions change with the amount of pressure. On looking attentively it will be observed that at the centre there is a circle of uniform color. If pressure is increased, this central circle dilates and at last forms a ring, and a new circle of a different color springs from its centre. This will in turn dilate and form a new ring, while another new circle will form within it, till at last a black spot appears at the centre of the system. After this no further pressure will produce a new circle, because we have now obtained a plate of air so thin as to be incapable of reflecting light. Newton traced seven colored rings around this central spot, which are called the first, second, third, &c., order. Each order, when white light is used, contains all the primary colors; thus, the red of the third order is the red in the third ring from the central black spot. The whole system of colors is called Newton's scale, and the principal laws of the phenomena are: 1. In homogeneous light the rings are alternately bright and black; the thickness corresponding to the bright rays of succeeding orders being as the odd numbers of the natural series, and those corresponding to the black rings as the intermediate even numbers. 2. The thickness corresponding to the ring of any given order varies with the color of the light, being greatest in the red light, least in the violet, and of intermediate magnitude in light of intermediate refrangibility. 3. The thickness corresponding to any given ring varies with the obliquity of the incident light, being very nearly proportional to the secant of the angle of incidence. 4. The thickness varies with the substance of the reflecting plates, and in the inverse ratio of its refractive index. To explain the effect of interference in producing the ring, let us consider a section of fig. 12. Let A C B represent the convex plate, and D E the plane plate. There will be a film of air between them, whose thickness increases from the point of contact, C, in proportion to the

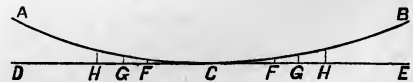


FIG. 12.—Explanation of Newton's Rings.

square of the distance. If a beam of light is received upon either surface, a portion will be reflected by the surface of the film of air, and another portion by the surface of the glass beyond it. There will thus be formed two systems of waves intersecting each other, and in-

creasing or destroying each other according to whether they conspire together or not. At a certain distance from C, as at E, the difference of the paths of the two beams is equal to a half undulation, and the waves interfere with and destroy one another, producing a dark ring. At a greater distance, as at G, the difference of the paths is equal to one whole undulation; therefore the waves conspire together and increase the amount of light, which also is decomposed, producing rainbow colors. With homogeneous light there is simply alternate increase of light and darkness. Now as the thickness of the plate of air at the distance from the centre where any ring is formed is in proportion to the square of this distance, or to the square of the diameter of the ring, it is only necessary to measure these diameters in order to determine the law of thickness. This was done by Newton with great accuracy, who found that the squares of the diameters were in an arithmetical progression; consequently the thicknesses of the plates corresponding to the successive rings form a similar progression. He moreover measured the absolute thickness of the plate of air at which each ring was formed, and found that at the dark ring of the fifth order it was  $\frac{1}{178,000}$  of an inch, this being ten times the thickness at the first bright ring. The successive orders of bright rings are therefore formed at the thicknesses  $\frac{1}{178,000}$ ,  $\frac{3}{178,000}$ ,  $\frac{5}{178,000}$ , &c., and the intermediate dark rings at the thicknesses  $\frac{2}{178,000}$ ,  $\frac{4}{178,000}$ ,  $\frac{6}{178,000}$ , &c.—POLARIZATION OF LIGHT. While making his researches on the law of double refraction, Huygens found that the rays divided by passing through a rhomb of Iceland spar possessed remarkable properties; that on passing them through a second rhomb the two portions did not remain equally intense; that their relative brightness depended on the position of the second rhomb, and that there were two positions in which one of the rays completely disappeared. Each of the rays has therefore acquired characteristic properties, or, it may be said, has lost properties. It is said to have acquired sides, but in fact it is reduced to vibrations in one plane. At Newton's suggestion it was said to be polarized. The phenomenon discovered by Huygens remained for more than a century an isolated fact in science, and other phenomena with which it is associated also remained unnoticed till the beginning of the present century. In 1808, while Malus was engaged in researches upon the subject of double refraction, he happened to turn a double-refracting prism toward the windows of the Luxembourg palace, which then reflected the rays of the setting sun. On turning round the prism the ordinary image of the window nearly disappeared in two opposite positions, while in two others at right angles to the former the extraordinary image nearly vanished. He at first ascribed this phenomenon to some influence of the atmosphere upon the ray similar to that produced by a second rhomb of Ice-

land spar, but he soon found that it was caused by reflection at a particular angle. This therefore was the second important discovery in regard to polarization: that it was not only produced by transmission, but by reflection; a discovery of great value in investigating the

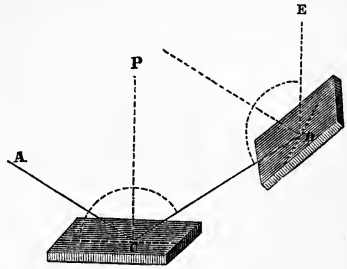


FIG. 13.

properties of light. A beam of light from a self-luminous source when passing through a homogeneous medium exhibits the same properties on all sides so long as it does not meet with an obstacle; such a beam is composed of ordinary or natural light. But after it has been reflected or refracted, it has lost some of its properties; some of its rays have been quenched. When the reflection takes place at a certain angle, nearly all the rays except those lying in a certain plane will have been obliterated. If the ray, having been thus reflected from a glass mirror, be received obliquely upon another glass mirror, and the latter turned around the ray, care being taken not to change the angle of incidence, the intensity of the twice-reflected beam will vary as the position of the mirror is changed. Let a ray of light A C, fig. 13, fall upon a plate of glass at C, making an angle of  $54^{\circ} 35'$  with the perpendicular; it will be reflected in the direction C D. Let the ray be received upon a second plate of glass, at the same angle with the perpendicular as before. If the second mirror is so placed that its plane of reflection is parallel to the plane of reflection from the first surface, it will be reflected in the direction D E without being diminished. But if the second mir-

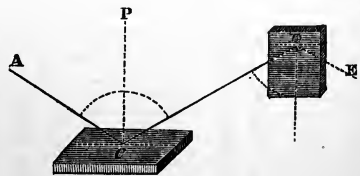


FIG. 14.

ror has its plane of reflection perpendicular to that of the first, as in fig. 14, then the ray will not be reflected, or its intensity will be greatly reduced. In intermediate positions at the same angle of incidence it will be partly reflected, the quantity of light being greater in propor-



tion as the planes of reflection become more nearly parallel. The plane in which a polarized ray is most easily reflected is called the plane of polarization, and it coincides with the plane of incidence and reflection. The angle of reflection at which polarization becomes most complete with any surface is called the polarizing angle for that surface, and varies with the substance, according to the following law discovered by Brewster: "The polarizing angle of a substance is that angle of incidence for

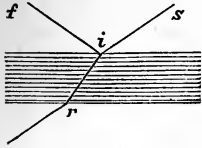


FIG. 15.

which the reflected polarized ray is at right angles to the refracted ray." Thus, in fig. 15, if  $si$  is the incident,  $ir$  the refracted, and  $if$  the reflected ray, the polarization is most complete when  $fi$  is at right angles to  $ir$ . It is still an unsettled question as to whether the vibrations of the polarized ray take place in the plane of polarization or at right angles to it. It is sometimes assumed for convenience

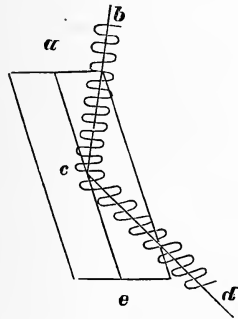


FIG. 16.

of explanation that they take place within it, but it is the opinion of Fresnel and Cauchy that they are perpendicular. MacCullagh and Neumann regard them as taking place within the plane. Fig. 16 will serve to represent the manner in which the vibrations take place according to Fresnel and Cauchy, where  $acbd$ ,  $bced$  is the plane of polarization. The majority of physicists are inclined to regard this as the more probable mode of motion. The following table shows the polarizing angles of a few transparent substances, chiefly according to the observations of Biot and Arago:

TABLE OF POLARIZING ANGLES OF MEDIA.

SUBSTANCE.	Polarizing angle.	SUBSTANCE.	Polarizing angle.
Fluor spar.....	54° 40'	Topaz .....	58° 40'
Water.....	52 45	Iceland spar....	58 23
Glass.....	54 35	Ruby.....	60 16
Obsidian.....	56 08	Zircon.....	63 08
Selenite.....	56 28	Sulphur.....	64 10
Amber.....	56 35	Ant. glass.....	64 45
Quartz.....	57 22	Chr. lead.....	67 42
Heavy spar....	58 0	Diamond.....	63 02

When a ray of light from a luminous source falls upon a glass plate at the polarizing angle, that portion of it which is refracted is also partially polarized. If that which has passed through one plate is afterward transmitted

through several in succession having their surfaces parallel, the polarization may be made tolerably complete. The planes of polarization of the reflected and the refracted rays are at right angles to each other, as are the planes of polarization of the ordinary and extraordinary rays in Iceland spar. If two plates of tour-

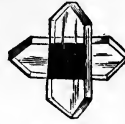


FIG. 17.



FIG. 18.



FIG. 19.

maline, a negative uniaxial crystal, which has been cut in sections parallel to its axis, are laid at right angles upon each other, as in fig. 17, the combination will be opaque; if placed diagonally, as in fig. 18, the opacity will be partial; and if they are placed parallel to each other, as in fig. 19, the light will pass through both as if they formed one piece. The light in passing through the first plate of tourmaline has been polarized, its vibrations having been reduced to one plane; or, as it is sometimes explained, all the rays except those which vibrate in one plane have been sifted out by the crystalline structure of the tourmaline, which has the property when not too thin of destroying the vibrations in the ordinary ray, and allowing only the extraordinary ray to pass through. Therefore, in order that all the rays which have passed through the first plate may pass through the second, the axes of the two must be parallel.—*Polarizing Apparatus.* There are various pieces of apparatus used in investigating the properties of polarized light, and they always consist of two parts, a polarizer and an analyzer. In the experiment with the reflecting glass plates, fig. 14, the first plate is the polarizer and the second the analyzer. In the case of the tourmaline plates, figs. 17, 18, and 19, that through which the light first passes is the polarizer, and the other the analyzer; and in the original experiment with Iceland spar, the first rhomb was the polarizer and the second the analyzer. Iceland spar, as has been said, is one of the most perfect of polarizing substances, but it does not in its natural form separate the two rays far enough for convenience. The desired separation has been accomplished by a very ingenious device of Nicol, a London optician, in the construction of a prism which bears his name. A rhombohe-

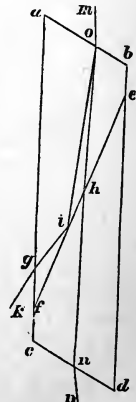


FIG. 20. Nicol's Prism.

When a ray of light from a luminous source falls upon a glass plate at the polarizing angle, that portion of it which is refracted is also partially polarized. If that which has passed through one plate is afterward transmitted

dron of Iceland spar has its natural faces, which make an angle with the obtuse edges  $a$  and  $b$ , fig. 20, of  $71^\circ$ , cut to an angle of  $68^\circ$ . It is then cut in a section  $ef$ , at right angles to the new faces  $ab$  and  $c d$ . The two parts are again joined together in their original position with Canada balsam, and mounted in a manner convenient for use. The index of refraction in Iceland spar for the ordinary ray is  $1.654$ , and for the extraordinary  $1.483$ . The refractive index of Canada balsam is  $1.549$ , so that when a ray of light  $mo$  enters the crystal at  $o$  and is divided into two rays,  $oi$  and  $oh$ , the ordinary ray  $oi$  is totally reflected by the surface of the Canada balsam in the direction  $ig$ , and refracted out of the crystal in  $gk$ ; while the extraordinary ray  $oh$  passes through the balsam in the direction  $hn$ , and is refracted in the direction  $np$ , parallel to  $mo$ . A beam of light therefore, passed through a Nicol's prism in this direction, will cast but one image upon a screen. This combination has been improved by Foucault by dispensing with the Canada balsam,

angles of incidence and refraction of the two mirrors are in the same plane, as shown in fig. 22, but will not be reflected when they are at right angles to each other, as in fig. 21. It is not necessary that both mirrors should have the same inclination to the vertical, the position given in the cut; that will depend on the direction of the incident ray. — *Elliptic and Circular Polarization; Interference of Polarized Light.* So far we have been considering cases in which the particles of ether in the polarized ray move in parallel straight lines at right angles to the direction of the ray, so that this lies in one plane; such is called plane polarized light. But when the ethereal particles are acted on by forces tending to alter their planes of vibration, they are supposed to describe curves which may be either ellipses or circles, depending on the components forming the resultant. An elliptic vibration may result from the action of two rectilinear vibrations at right angles to each other which differ in phase, as in the ordinary and the extraordinary ray; therefore, when a plane polarized ray is reflected from a surface, or passed through a double-refracting plate cut parallel to its axis and placed in certain positions, it is either elliptically or circularly polarized. In the case of polarization by reflection, when the azimuth of the plane of polarization of the incident ray is  $45^\circ$ , we may conceive this resolved into two rays, one in the plane of incidence and the other in the perpendicular plane, which are equal to each other; and if they differ in phase by one quarter of an undulation, the light will be circularly polarized. According to the theory of Fresnel, the change of phase is produced at the moment of reflection, and the amount of change has been deduced by him through the most ingenious mathematical reasoning. In reflection from St. Gobain glass Fresnel found the difference of phase in the two rays was one eighth of an undulation when the angle of incidence was  $54^\circ 37'$ . Therefore, if a rhomb of this glass is formed with its faces of incidence and emergence inclined to the other faces at this angle, and a ray is sent into it perpendicular to one of the faces, it will take the direction  $abcd$ , fig. 23, being reflected at  $b$  and  $c$ , and emerge perpendicularly at the opposite face, with a difference in phase of a quarter of an undulation. If therefore the incident ray is polarized in a plane inclined at an angle of  $45^\circ$  to the plane of reflection, the emergent light will be circularly polarized. This theory, the result of pure mathematical reasoning, was verified by experiment. If this circularly polarized ray is transmitted through a second rhomb parallel to the first, it will become plane-polarized.

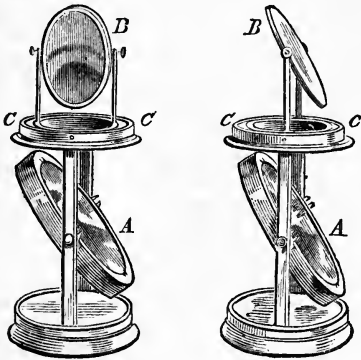


Fig. 21. Malus's Polariscopes. Fig. 22.

thus having nothing between the divided surfaces except a film of air. If the length of the prism is such that the two rays may fall upon the divided surface at angles intermediate to those corresponding to the indices of refraction, the ordinary ray will be wholly reflected, while the extraordinary ray will be refracted, and therefore transmitted. Malus's polariscopes, figs. 21 and 22, consists of two reflectors,  $A$ , the analyzer, and  $B$ , the polarizer. They are each composed of a pile of glass plates which may be turned about a horizontal axis, the analyzer also turning about a vertical axis, the angle of rotation being measured on the horizontal circle  $CC$ , which also holds the substance to be experimented upon. The polarizer is set so that a beam of light reflected at the polarizing angle shall be thrown vertically upward. If the analyzer is set at an angle of about  $35^\circ 25'$  from the perpendicular (the precise angle depending on the refractive index of the glass), the polarized ray will be reflected when the

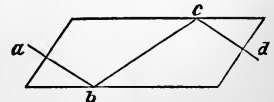


Fig. 23.—Fresnel's Rhomb.

the emergent light will be circularly polarized. This theory, the result of pure mathematical reasoning, was verified by experiment. If this circularly polarized ray is transmitted through a second rhomb parallel to the first, it will become plane-polarized.

If a plate of a double-refracting crystal, cut parallel to its axis, is interposed between the polarizer and analyzer of any polarizing apparatus, certain effects are produced when a strong beam of light is sent through it, which depend upon the position of the interposed plate as well as upon the relative positions of the polarizer and analyzer. When the interposed plate has its axis parallel or perpendicular to the plane of the polarizer or analyzer, and these have their planes crossed at right angles, no change will take place in the phenomena, although in fact, when the axis of the interposed plate is perpendicular to the polarizer, it becomes itself an analyzer, and intercepts the polarized ray. When turned through an angle of  $90^\circ$ , it allows it to pass and be intercepted by the analyzer proper; but if it is turned around gradually, a portion of light will pass through the analyzer, which increases in quantity till it has been turned through an angle of  $45^\circ$ , when on further turning the light will gradually diminish till the plate has been turned through an additional angle of  $45^\circ$ , when it will vanish. This phenomenon has been called depolarization, though improperly, and has been made use of by Malus to detect double-refracting substances in which no bifurcation of the rays could in any other way be detected. When the interposed plate is moderately thick, the transmitted light is white; but when reduced to a very thin plate or film, the most gorgeous colors appear, which vary with every change of inclination of the interposed plate. Thin plates of mica or selenite, from  $\frac{1}{30}$  to  $\frac{1}{60}$  of an inch thick, are the most convenient for exhibiting these effects. If the thickness of the plate is uniform, the transmitted light will be of a uniform color, differing however with plates of different thickness, the intensity being greatest when the axis of the plate is inclined at an angle of  $45^\circ$  with the plane of primitive polarization, and the color vanishing altogether when the axis of the plate coincides with the plane of primitive polarization or is perpendicular to it. But if the interposed plate be fixed and the analyzer turned, the color will change through every grade of tint into the complementary color. Suppose the position of the plate to be that in which the color is the brightest, viz., at an angle of  $45^\circ$ , and suppose the color to be red; now on turning the analyzer the color will grow fainter till it has moved through an angle of  $45^\circ$ , when it disappears, and no light is transmitted; on continuing to turn the analyzer, the complementary color green makes its appearance, increasing in intensity till a further angle of  $45^\circ$  is reached, when it will also begin to diminish, and finally vanish at a further angle of  $45^\circ$ , or  $135^\circ$  from the first position, when the red will again appear and attain its greatest brightness at  $180^\circ$  from the first position. Whatever may be the color at one position of the analyzer, the complementary color will appear on turning it

through an angle of  $90^\circ$ . To prove that the colors are complementary, a double-refracting prism may be used as the analyzer, in which two rays will be transmitted, each of which will exhibit alternately the same changes of color; and if they are near enough together to overlap, the overlapping space will exhibit white light. When a plate is used which varies in thickness, the tints follow the laws of the colors of Newton's rings. The thickness producing corresponding tints, however, is much greater in crystalline plates exposed to polarized light than in thin plates of air or any other uniform medium. The black of the first order appears in a plate of sulphate of lime when its thickness is  $\frac{1}{24000}$  of an inch, and between that and  $\frac{1}{2000}$  of an inch is contained the whole succession of colors of Newton's scale. The color produced by a plate of mica in polarized light is the same as that reflected from a plate of air only  $\frac{1}{400}$  as thick. With Iceland spar the same color is produced when the thickness is about 13 times that of the plate of air. The physical explanation of these phenomena may be briefly stated as follows: A ray of light striking a double-refracting crystal is divided into two of unequal velocities, thus seemingly affording the conditions of interference if the plate is sufficiently thin; but if these conditions were sufficient, the phenomena of interference ought to be produced without the polarizing apparatus. But in polarized light the case of interference is different from that in ordinary light. In the latter the rays lie in planes of all azimuths, while in polarized light they lie only in two planes at right angles, and therefore they cannot interfere with each other. The subject was examined with reference to this point by Fresnel and Arago, who found that two rays polarized in the same plane interfere like two rays of ordinary light, and produce fringes, and that when the planes of polarization are inclined to each other the interference will be diminished until the angle between them is  $90^\circ$ . It was further found that two oppositely polarized rays will not interfere when their planes are made to coincide, unless they are derived from a pencil originally polarized in one plane, and which has lost or gained half an undulation in passing from one plane to the other. If now the planes of polarization of two rays which have been made to differ in length by half an undulation, or any odd number of half undulations, can be brought to coincide, interference will follow; and this is accomplished by interposing the thin plate of double-refracting crystal which causes the light that has been reduced to one plane by the polarizer to be divided into two rays, one ordinary and the other extraordinary, and differing in phase by half a wave length.—*Colored Rings*. If a thin plate of a double-refracting crystal, as Iceland spar, cut perpendicular to its axis, be substituted for the thin plate cut parallel with its axis used in the experiment

last described, and a cone of converging or diverging rays is passed through it, or if the analyzer is brought so near to the eye that the visual rays converge toward its optic centre, brilliant colored rings are produced, differing in form according as the plate is uniaxial or



FIG. 24.—Tourmaline Pincetto.

biaxial. A simple mode of viewing the phenomena is by employing the tourmaline pincetto, fig. 24, a small instrument made by placing two tourmalines cut parallel to their axes in two metallic disks, *a*, *b*, so that they may be turned in parallel planes and their axes given any angle to each other. A spring presses them together, by which means the substance to be examined may be held in position. When the plate of Iceland spar or other uniaxial crystal cut perpendicular to its optic axis is placed between the crossed tourmalines, and held near to the eye and toward the light, the rings above mentioned, intersected by a black cross, fig. 25, will be observed. If the tourmalines are placed with their axes parallel, the



FIG. 25.



FIG. 26.

cross will be white, as shown in fig. 26, while the order of colors will be complementary. If homogeneous light is used, as for instance red, the rings will be simply red and black. If the light is violet, the rings will be violet and black, and they will be smaller, their size varying with the increase of refrangibility from red to violet. To understand the formation of these rings, it must be remembered that rays of light which travel through the axis of a uniaxial crystal are alike in velocity, and therefore no chromatic effects will be produced in the centre; but the converging polarized rays, being inclined to the axis, will be divided into ordinary and extraordinary rays, with sufficient difference in phase to produce fringes by interference when reduced again to the same plane by the polarizer. The thickness of plate which the rays traverse increases with the divergence, so that at equal distances from the centre they will alternately conspire together or destroy each other, producing bright and dark rings. The explanation of the cause of the appearance of the crosses requires abstruse mathematical reasoning. The conclusions arrived at, however, are that in the two planes passing through the axis of the interposed

plate, which are parallel and perpendicular to the axis of the polarizing tourmaline, the polarized ray is not resolved into two components, and consequently there are in those directions no conditions for interference. Therefore, when the tourmalines have their axes at right angles the cross will be black, and when they are parallel it will be white. In biaxial crystals colored rings are produced having more complicated forms, the colored bands having the form of curves with two centres corresponding to the two optic axes of the crystal. If a plate of a biaxial crystal which has its optic axes inclined at a small angle, not exceeding  $5^\circ$  or  $6^\circ$ , is cut at right angles to the

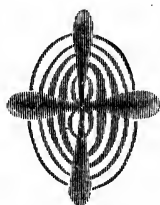


FIG. 27.



FIG. 28.

medial line and held between the tourmalines in such a manner that the plane of the optic axes is parallel to the axis of one of the tourmalines, an appearance represented in fig. 27 will be presented when the tourmalines are crossed. When the double-refracting plate is turned around in its plane, the rings turn in the same direction, while the cross separates into two branches, as seen in fig. 28; and when the plane of the axes makes an angle of  $45^\circ$  with the axes of the tourmalines, the appearance seen in fig. 29 results, the branches of the cross having the form of hyperbolas. When the axes of the tourmalines are parallel, the colors are complementary and the cross is white. When a biaxial crystal is cut perpendicularly to one of its optic axes, it will present the appearance shown in fig. 30.—



FIG. 29.

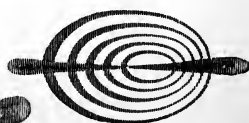


FIG. 30.

*Rotation of Plane of Polarization.* In the cases which have been considered the changes of plane which take place when a polarized ray is reflected or refracted are definite and independent of the distances through which it passes in either medium; but there are substances which change the plane of polariza-

tion in proportion to their thickness. If a ray of polarized light is sent through a plate of Iceland spar or other uniaxial crystal in the direction of its axis, its plane is not changed; but when a plate of rock crystal is cut in the same direction and a polarized ray of homogeneous light is passed through its axis, its plane will be found changed on emergence. It will have rotated on its axis, and this rotation may be either to the right or to the left, and the amount of rotation will depend upon the thickness of the plate. The direction of the rotation serves to classify such crystals into right- and left-handed. If the prisms of the polarizing apparatus are crossed so as to produce extinction of light, and the substance to be examined then introduced, there will be, if it possesses the properties above mentioned, a partial restoration of light. If now the analyzer is turned through a certain number of degrees, the light will again disappear, and the angle through which the analyzer has been turned will be the measure of the rotating power of the substance. The principal laws of rotatory polarization, the discovery of which is due to Biot, embrace the following facts: 1. With the same substance the rotation of the plane of polarization is in proportion to the thickness of the substance traversed. 2. When two plates are placed together, the effect is nearly the same as that of a single plate whose thickness is equal to the sum or difference of the two plates, according as they rotate the ray in the same or opposite directions. 3. The degrees of rotation of the plane of polarization vary with the different rays of the spectrum, and increase with their refrangibility. For a given plate the angle of rotation is inversely as the square of the length of the wave. Therefore, as the rays of different colors emerge polarized in different planes, if a beam of white light is sent through a rotating crystal or substance and then received by the analyzing prism or plate, as this is turned the different colored rays of polarized light will make their appearance in succession. Sir David Brewster discovered that amethyst or violet quartz is made up of alternate layers of right- and left-handed quartz; and the structure may be distinguished in the fracture of the crystal, which presents a peculiar undulating appearance. Biot and Seebeck discovered that many liquids and vapors have, like quartz, the power of rotating the plane of polarization. Oil of lemon, solution of sugar in water, and solution of camphor in alcohol rotate the polarized ray to the left; oil of turpentine rotates it to the right. The power of these liquids is, however, much feebler than that of quartz, and therefore greater thicknesses are required to be employed. When liquids having this property are mixed, the rotation produced by the mixture is equal to the sum or difference of that of the ingredients, and Biot made an application of this principle to the analysis of compounds containing a substance having rotatory power, combined with

others which are neutral. Polarized light, therefore, has a practical application as a test for a variety of substances; many cases of doubtful identity in chemical analysis being alone decided by its use. The saccharometer of M. Soleil is constructed in accordance with these properties of light. It is used in the arts for ascertaining the percentage of sugar in solutions, and in medicine for testing its presence, as well as determining its quantity in the fluids of the body. It may also be applied in detecting albumen and other organic bodies. Arago employed polarization by double refraction in the construction of a photometer; and he has also shown how rocks beneath the surface of water may be discovered by using a Nicol's prism to extinguish the reflected rays by which the submerged rocks are prevented from being seen. Chromatic polarization may be employed with advantage in crystallography, to indicate whether a crystal has one or two axes of symmetry, and also the positions of these axes. By the use of the polariscope we may ascertain whether the light which comes to us from the heavenly bodies is reflected from their surfaces, as from the moon and planets, or whether the bodies are self-luminous.—Faraday made the discovery that the plane of polarization can be rotated by the action of magnetism. If a cylindrical or rectangular bar of "heavy" or "Faraday's glass" (silico-borate of lead) is placed longitudinally between the poles of a powerful electro-magnet which is hollow in its axis (to admit of observation), and a Nicol's prism is placed in one end of the magnet as polarizer, and another in the other end as analyzer, and they be so turned that no light passes through both, then, as long as no current passes around the temporary magnet, the interposition of the glass bar will have no effect; but when a current is passed around the magnet, rotation of the plane of polarization takes place, and in the direction of the current. The degree of rotation is in proportion to the length of the bar and the strength of the current. Flint glass is acted on with about half as great effect as heavy glass, and all transparent solids and liquids are more or less affected in the same manner. Faraday thought that the magnetism had a direct action on the light, but others have since believed that the rotation is produced by a molecular change induced in the glass by the magnet. It has been stated that when glass is subjected to strain or unequal pressure its homogeneous texture is altered, and the particles are so disposed that it acquires the property of double refraction. It consequently has the power of producing polarization of light transmitted through it, analogous to that possessed by natural double-refracting crystals. The compression or strain may be produced by rapid cooling of fused glass, or the glass may be compressed in a vice.—From the fact that polarization always takes place when rays of light are reflected from surfaces



at particular angles, it follows that much of the light that is transmitted through the air is more or less polarized in consequence of being reflected from the surfaces of the numerous contained particles of atmospheric dust and vapor. If the sky is examined through a Nicol's prism, it will be found that the greatest amount of polarization is in rays that come from directions at right angles to the sun; that is to say, when the sun is in the horizon, from an arc passing through the zenith, each end meeting the horizon  $90^\circ$  from the position of the sun. If the sun were in the zenith, the greatest amount of polarization would be in the circular horizon. It is evident, therefore, that if a polarizing apparatus is held with its axis perpendicular to the path of the sun, an interposed selenite plate or other double-refracting crystal, by causing interference of polarized light, will afford an indication of the time of day. An instrument based upon this principle invented by Sir Charles Wheatstone, called a polar clock, is another of the practical applications of the more refined discoveries in molecular physics. (See POLAR CLOCK.) Prof. Tyndall, in making experiments upon minute quantities of gaseous vapors, found that when condensation commenced, if a powerful ray of light was sent through the experimental tube, an "incipient cloud" was illuminated, which upon examination was found to reflect polarized light. This at first would be a very pure blue, and nearly perfectly polarized in a direction perpendicular to the beam of light; but as the vapory particles became larger the cloud became whiter, and the amount of polarization diminished till at last it was not perceptible. The vapor which gave the greatest effect was that of nitrite of butyle. He concludes that at the first formation of the cloud the vapory particles are less in diameter than the length of a wave of light, so that the most refrangible rays are the first to be scattered, the addition of the others producing white light. It is therefore concluded that the blue color of the heavens is owing to the scattering of the more refrangible rays of light by the minute particles of aqueous vapor held in the atmosphere before any visible condensation has taken place, and that the white color of clouds is owing to the scattering of all the rays. It appears that the polarizing angle for matter in a state of vapor does not follow the ordinary law and change with the substance, but that it is always  $45^\circ$ , so that the polarized is always at right angles to the reflected beam. Several facts in regard to atmospheric polarization were observed many years ago by Sir David Brewster, Sir John Herschel, and others.—The verification of Fresnel's prediction in regard to circular polarization was one of the great tests of the undulatory theory of light, as well as an example of the transcendent power of genius. An equally remarkable example was the deduction from Fresnel's theory of double refraction

of a result which that mathematician had not himself foreseen. This deduction was made by Sir William Hamilton, and experimentally verified by Dr. Lloyd of Dublin. According to Fresnel's theory of double refraction in biaxial crystals, the wave surface intersects the plane of the crystal in a circle and an ellipse whose magnitude is such that they intersect at four points, as represented in fig. 31. Dr. Lloyd's explanation is as follows: "When two rays pass within the crystal in any common direction, as  $O A B$ , their velocities are represented by the radii vectores of the two parts of the wave  $O A$  and  $O B$ , and their directions at emergence are determined by the positions of the tangent planes at the points  $A$  and  $B$ . But in the case of the ray  $O P$ , whose direction is that of the line joining the centre with one of the four cusps which are formed by the intersections of the circle and ellipse, the two radii vectores unite, and the two rays have the same velocity. There are still, however, two tangents to the plane section at the point  $P$ ; so that it might be supposed that the rays proceeding with this common velocity within the crystal would still be divided at emergence into two, and two only, whose directions are determined by the tangent planes; and this seems to have been Fresnel's view. But Sir William Hamilton has shown that there is a cusp at each of the four points just mentioned, not only in this particular section, but in every section of the wave surface passing through the line  $O P$ , or that there is a conoidal cusp on that surface at the four points of the intersection of the circle and ellipse, and consequently an infinite number of tangent planes which form a tangent cone of the second degree. Hence a single ray, such as  $O P$ , proceeding within the crystal in one of these directions, should be divided into an infinite number of rays at emergence, whose directions and planes of polarization are determined by the tangent planes. Again, it is evident that the circle and ellipse have four common tangents, such as  $M N$ ; and the planes passing through these tangents, and perpendicular to the plane of the section, are perpendicular to the optic axis of the crystal. Fresnel seems to have thought that these planes touched the wave surface in the two points just mentioned, and in these only; and consequently that a single ray (incident upon a biaxial crystal in such a manner that one of the refracted rays should coincide with an optic axis  $O M$  and  $O N$ , determined by the points of contact. But Sir William Hamilton has shown that the four planes touch the wave surface, not in two points only, but in an infinite number of points, constituting each a small circle of con-

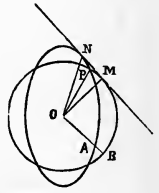


FIG. 31.

tact; and consequently that a single ray of common light, incident externally in the above mentioned direction, should be divided into an infinite number of refracted rays within the crystal. Here are two singular and unexpected consequences of Fresnel's theory, not only unsupported by any facts hitherto observed, but even opposed to all the analogies derived from experience; here are two remote conclusions of that theory deduced by the aid of a refined analysis, and in themselves so strange that we are inclined at first to reject the principles of which they are the necessary consequences. They accordingly furnish a test of the truth of that theory of the most trying nature that

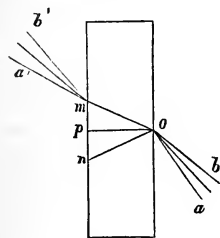


FIG. 32.

can be imagined." Dr. Lloyd, at Sir William Hamilton's request, made the following experiments: There were two cases in which it was expected cones of light would be produced. The first was that of external conical refraction. A plate of aragonite, a biaxial crystal, was prepared with its faces perpendicular to the line  $o p$ , fig. 32, bisecting the optic axis, which in aragonite contains an angle of about  $20^\circ$ . "A thin metallic plate perforated with a very minute aperture was placed on each face of the crystal, with one aperture at  $o$  and the other at  $m$ . The flame of a lamp was then brought near one of the apertures, and in such a position that the central ray of the converging beam should have an incidence of  $15^\circ$  or  $16^\circ$ . When the adjustment was completed a brilliant annulus of light (fig. 33) appeared on looking through the aperture in the second surface. When the aperture in the second plate was very slightly changed so that the line connecting the two apertures no longer coincided with the line  $m o$ , the phenomena rapidly changed and the annulus resolved itself into two separate pencils." It was



FIG. 33.

found that the rays composing the emergent cone were all polarized in different planes, which are connected by the following law: "The angle between the planes of polarization of any two rays of the cone is half the angle between the planes containing the rays themselves and the axis." The law was discovered by observation, but may be deduced from Fresnel's theory. "The other case, that of internal conical refraction, was expected to take place when a single ray has been incident externally upon a biaxial crystal in such a manner that one of the refracted rays may coincide with an optic axis. The incident ray in this case should be divided into a cone of rays within

the crystal, the angle of which, in the case of aragonite, is  $1^\circ 55'$ . The rays comprising this cone will be refracted at the second surface in directions parallel to the incident ray so as to form a small cylinder of rays in air whose base is the section of the cone made by the surface of emergence. This is represented in fig. 34, in which  $n o$  is the incident ray,  $a o b$  the cone of refracted rays within the crystal, and  $a' b b'$  the emergent cylinder." This experiment was more difficult than the other. Suffice it to say that when the required position was attained the two rays into which the incident ray was divided "suddenly spread out into a continuous circle." The experiment was repeated with the sun's light, and the cylinder received on a screen at various distances, but with no change in the size of the section. The observed angle of the cone was  $5'$  less than the theoretical,  $1^\circ 55'$ . The rays of the internal cone are all polarized in different planes, and governed by the same laws as in the other case.—*Polarization of Heat.* The rays of heat being identical in nature with those of light, it might be supposed that they would be governed by similar laws of double refraction and polarization, and this has been found to be the case. The first experiments were made by Malus and Bérard in 1810. By using a piece of rock salt formed in the shape of a rhombohedron similar to Fresnel's rhomb, of St. Gobain glass, Forbes found that heat, like light, is circularly polarized. It has also been shown by Knoblauch and others that the rays of heat suffer diffraction and interference like those of light.—*CHEMICAL ACTION OF LIGHT.* A great many substances undergo chemical change when exposed to the light of the sun, or to that of certain artificial sources. This is explained upon the undulatory theory by supposing that the kinetic energy of the molecules of ether is transferred to the molecules of the substance in such a degree as to cause them to be shaken asunder. The measurement of the chemical action of light and the investigation of its laws were successfully commenced by Dr. John W. Draper of New York about the year 1840. He employed for the purpose of measurement a reaction originally observed by Gay-Lussac and Thénard, which takes place in a mixture of chlorine and hydrogen—gradually in diffuse, explosively in direct sunlight. His apparatus enabled him to determine the amount of hydrochloric acid which would be produced in a given time with given volumes of the gases; and although these were pioneer experiments, they led him to the first great law of photo-chemical action, viz.: "that the chemical action of light varies in direct proportion to its intensity, and to the time of the exposure." The subject has been

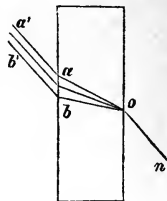


FIG. 34.

since examined by others, particularly by Bunsen and Roscoe, whose experiments, together with other matter pertaining to the subject, will be found in the articles PHOTOMETRY and PHOTOGRAPHY.—For a more extended consideration of the subject of light, see the treatise on the undulatory theory of light by President F. A. P. Barnard, published in the Smithsonian report for 1862; an "Essay on the Velocity of Light," by M. Delaunay, translated by Alfred M. Mayer, in the Smithsonian report for 1864; *Œuvres complètes d'Augustin Fresnel* (3 vols., Paris, 1867-'70); Wüllner's *Lehrbuch der Experimental Physik* (vol. ii., Leipzig, 1871); and "The Wave Theory of Light," by Humphrey Lloyd, D. D., D. C. L. (London, 1873).

**LIGHT, Aberration of.** See ABERRATION.

**LIGHT, Zodiacal.** See ZODIACAL LIGHT.

**LIGHTFOOT, John**, an English clergyman, born in Stoke-upon-Trent, March 29, 1602, died in Ely, Dec. 6, 1675. He was educated at Christ's college, Cambridge, and became chaplain to Sir Rowland Cotton, a celebrated Hebrew scholar, who inspired him with a desire to become one also. Anxious to prosecute his studies, he removed to Hornsey, near London, where he could have access to libraries. In 1629 he published "Erubhim, or Miscellanies, Christian and Judaical," and dedicated it to Sir Rowland, who presented him to the rectory of Ashley in Staffordshire. In 1642 he was appointed minister of St. Bartholomew's in London, and a member of the assembly of divines sitting at Westminster. Shortly after he was made master of Catharine hall, Cambridge, and presented to the rectory of Great Munden in Hertfordshire. In 1655 he was chosen vice chancellor of the university, and after the restoration a prebendary of Ely. Lightfoot was a very learned Hebraist for his time, and was remarkable for his intimate acquaintance with rabbinical literature. One of his most important works, *Horæ Hebraicæ et Talmudicæ* (Cambridge, 1648), has been reëdited by R. Gandell (4 vols., Oxford, 1859). At the time of his death he was engaged on the "Harmony of the New Testament." The first collected edition of his works appeared in 1684; the best edition of them is that of the Rev. J. R. Pitman (13 vols. 8vo, London, 1822-'5).

**LIGHTFOOT, Joseph Barber**, an English clergyman, born in Liverpool in 1828. He was educated at Trinity college, Cambridge, where he graduated in 1851, was elected fellow in 1852, took orders in 1854, and became tutor of Trinity college in 1857. He was also appointed honorary chaplain to the queen and Hulsean professor of divinity in the university in 1861. A few years later he became examining chaplain of the archbishop of Canterbury, and in 1871 was made canon residentiary of St. Paul's cathedral, London. He has published "St. Paul's Epistle to the Galatians" (1869), "The Two Epistles to the Corinthians of St. Clement of Rome" (1869), "St. Paul's Epistle to the

Philippians" (1870), each with revised text, notes, &c.; also an essay "On a Fresh Revision of the English New Testament" (1871).

**LIGHTHOUSE**, a structure from the top of which a light is shown at night as a direction or warning to mariners. Lighthouses are necessarily situated on headlands, isolated rocks or sands, and pierheads; and from the benevolence of their design, and in many instances from the boldness of their construction, they have always been objects of interest independently of their use to mariners. We propose to treat the subject under the following divisions: 1, materials and mode of construction; 2, method of illumination; 3, auxiliary safeguards to navigation; 4, history and statistics. 1. **MATERIALS AND MODE OF CONSTRUCTION.** The materials used in the construction of lighthouses are wood, stone, brick, cast iron, and wrought iron. Stone, brick, and iron are the most important, and are used exclusively in all large lighthouses. The most noted lighthouses in the world are built of stone; and in northern climates, where the first cost is not the great consideration, stone should be exclusively used. The form of all stone lighthouses approaches more or less the frustum of a cone or pyramid. They are sometimes built to include the keepers' apartments, but more usually they merely contain the staircase and cleaning and watch rooms, with a receptacle for the oil butts. In all cases where large lighthouses are built of this material, the masonry should be of the best cut stone with hydraulic cement mortar. The first cost should never be so limited that this principle cannot be fully carried out. The same principle applies to brick lighthouses, which should be built of the best and hardest bricks, laid in hydraulic cement mortar. The interior walls of all lighthouses should be as separate as possible from the outer walls, in order that there may be a free circulation of air between the walls. The dryness of the inner wall is insured by this arrangement, without which all large masses of masonry like large lighthouses must be constantly damp. The inner wall must of course be firmly tied to the outer shell by masonry or iron ties. Cast-iron lighthouses were first erected by Mr. Alexander Gordon, an English civil engineer. Two were constructed in England, and were erected on the islands of Bermuda and Jamaica. From the fact that every part of the structure can be completed at the workshop, cast-iron lighthouses answer admirably for positions at points remote from large centres of manufacture, and are gradually coming into use. Several lighthouses of this kind have been erected at various places on the coasts of the United States. They require a lining of brick, the weight of which prevents oscillation or swaying, while its low conducting power of heat hinders the deposition of moisture on the well room of the stairs, which would otherwise be occasioned by the difference of temperature between the inside and outside of the tower. To further

this latter object space is also left for a current of air to flow between the iron and brick. Another kind of iron lighthouse is the wrought-iron pile lighthouse. The lower ends of the iron piles are fitted with large cast-iron screws where the foundation is soft, and the piles are screwed to a firm bearing, or where the foundation is rock these ends are sharpened, and the piles are driven into the rock or hard ground by an ordinary pile driver, until they come to a firm bearing upon cast-iron disks which bear upon shoulders forged on the piles. The number of piles depends upon the plan of the structure, which may be square, hexagonal, or octagonal. The foundation having been placed, the structure, which is of wood or boiler iron, firmly braced to the piles, and connected with them by iron castings, is easily built upon it. This kind of lighthouse was first built in England; the screw pile was patented about 1836 by Mitchell, and is called Mitchell's screw pile. It was introduced into the United States about 1845, and has since been used in the construction of many important lighthouses on the coast. Experience has shown that iron-pile lighthouses are not suitable for foundations in water in climates where much ice is formed. The ice, moving in large fields, bends and sometimes breaks the piles, and, by forming upon the piles themselves, makes the bulk of the structure so large that the effect of the waves upon it is very much increased. On this account it is not likely that iron-pile structures will be much used north of Chesapeake bay; but on the southern coasts they have been found particularly adapted to the necessities of the service, and about 70 of this class of structures, resting upon screw piles and iron disks, now exist in the United States. Their annual cost for repairs is very small, a yearly coat of paint being all that is needed to keep the exterior in good order. They are particularly suited for bays and sounds in the southern waters, where light vessels have been in use until the present time. As these vessels become in need of repairs, they are withdrawn, and a screw-pile lighthouse is built upon the site, at a cost not much exceeding that of the repair of the vessel, and with an annual expense of maintenance less than one half of that of the vessel.—Lighthouse towers are generally surmounted by parapet walls, which vary in height from 3 to 7 ft. according to the order of the light. Upon the parapet wall is placed the lantern in which the illuminating apparatus is contained. The lantern is a glazed framework made of brass or iron, and varies in dimensions from 6 ft. in diameter and 4 ft. in height to 12 ft. in diameter and 9 ft. in height. It is a regular polygon, and can be made of any number of sides, depending upon the various circumstances to be considered. It is surmounted by a dome constructed of copper or iron, which is generally lined with some other metal, leaving an air space between the two metals, to prevent condensation of moisture. A ventila-

tor is placed upon the top, from which the heated air escapes, and registers are inserted near the bottom of the lantern to enable the keeper to regulate the supply of fresh air at will. Upon the convenience and proper construction of the lantern the efficiency of the lighthouse in a great measure depends. II. METHOD OF ILLUMINATION. The materials which have been used for the illumination of lighthouses are: 1, wood and coal; 2, candles; 3, oil; 4, gas; and 5, the electric current acting upon carbon points. Wood and coal were the first fuels used for lights. They were first burned as beacon fires on headlands, and afterward, as the necessity of increased elevation was felt, the fire was placed at the top of a tower. It is not known that any other method of illumination for lighthouses was used until about 1760, when Smeaton commenced the use of wax candles in the Eddystone lighthouse. Another lighthouse built by him on Spurn point about 1774 was arranged for illumination by coal, which fact shows that the use of wax candles had not become general at that date. Tallow candles were afterward used at the Eddystone. Some of the English and Scotch lights consumed coal as late as 1816, and several on the coasts of Sweden and Norway were illuminated with this material as late as 1846. The vast improvement made in lamps by the use of the Argand burner and glass chimney made a complete revolution in the lighthouse systems of the world. The parabolic reflector with this burner was introduced into lighthouses gradually from 1785, when the first apparatus of this kind was erected in the Cordouan lighthouse. In the United States the first lighthouses were lighted with tallow candles and solid-wicked lamps, suspended from the domes of the lanterns by iron chains. The lamps were in shape and in principle like the old-fashioned links. The Argand burners and reflectors were adopted in 1812, and were used till 1852, when the general introduction of the lens system commenced. Since the adoption of Argand lamps in lighthouses, oil has been used as the combustible. In Europe the vegetable oils (olive and rape-seed or colza) have been generally used. Great Britain however uses sperm oil as well as colza, though the latter bids fair to supersede it. Various other oils, animal and vegetable, have been tried with more or less success, but hitherto none but the sperm and lard among the animal oils, and the colza among the vegetable, have come up to the requirements of lighthouse illumination. In the United States lard oil is the fluid now generally used. Its cost is about one third that of sperm oil, and although its freezing point is some degrees higher, this objection is not material in climates the winter temperature of which is lower than the freezing points of both oils. Its capillarity is greater than that of sperm oil, so that a higher wick can be used with it, without danger of smoke.—Attempts have been made to use gas in lighthouses. Difficulties have been found in

getting the proper shape of flame for deviation by the illuminating apparatus; and the uncertainty of the supply where the gas is made at the lighthouse is another objection, and one so serious that a full supply of oil has had to be kept at the station for fear of accidents to the gas apparatus. In a few cases gas has been introduced into lighthouses near towns supplied with it. These, however, have been small lighthouses, and the examples are from the nature of the case rare, and cannot be extended beyond harbor lights. In one case in the United States a lighthouse is lighted with natural gas. In the present state of the gas manufacture it seems impossible to make a burner that will give the proper size and shape of flame for the large orders of lights. No metal but a very refractory one can bear the intense heat developed by four cylindrical concentric flames, the largest of which is  $3\frac{1}{2}$  in. in diameter; and the expense of making burners of such a metal would be very great. As an economical question it is doubtful whether gas should be substituted for oil. The first cost of the gas apparatus for a large lighthouse is heavy, and the annual expense of repairs is also large. It is probable that the efficiency or brilliancy of the light would not be materially increased by the change from oil to gas, as the lights fitted with Fresnel apparatus now show as far as the curvature of the earth will permit.—Experiments have been made in the United States on the electric light by Prof. Henry, chairman of the lighthouse board. He came to the conclusion that the slight gain in its power of penetrating fogs does not compensate for the increased cost of apparatus, difficulty of attendance, and liability to derangement. In a lecture delivered March 9, 1860, before the royal institution, Prof. Faraday spoke of the light produced by electricity as being especially adapted for lighthouses on account of its intensity, while it occupied at its source no more space than a common candle. The voltaic battery, however, presented difficulties which rendered its use for this purpose impracticable, but from which the magneto-electric apparatus was found to be free. A large apparatus of this character, worked by a two-horse steam engine, had been employed for six months at the South Foreland lighthouse, which produced such an intensity of light that it was often seen from the opposite coast of France. Prof. Faraday anticipated that, if the expense of this mode of illumination did not prove too serious, it would be adopted in many situations where intense light is required.—Experiments have been made upon kerosene with reference to its use in lighthouses, but it is not feasible to make the flame of this oil of the proper size and shape for deviation by the large lenses, in the present state of knowledge on the subject. The difficulty appears to be that the immense heat of so large a flame sets free a great amount of carbon, which passes off unconsumed as smoke, and covers the apparatus and glass

of the lantern with a thick coating of black. Until means can be devised for the consumption of this excess of carbon, kerosene cannot be used. Experiments lately made in the United States have convinced the lighthouse board that petroleum is too dangerous a fluid to be used for lighthouse purposes. The danger consists not merely in burning it in a proper lamp, but in its transportation in large quantities, in drawing it from the butts, and in filling the lamp reservoirs. In Europe, however, petroleum is coming into general use, and France has ordered a change to mineral oil in all of its lighthouses.—The illuminating apparatus is either catoptric by reflectors, or catadioptric by lenses. The latter method of illumination has been fully described in the article FRESNEL. In the catoptric method, which was mostly used until within the last 30 years, the light from each lamp is so deviated by a reflector that it emerges from the lantern, a beam, or nearly a beam, parallel to the horizon. The earliest known instance of a reflector being used for this purpose was in the Cordouan lighthouse, in the bay of Biscay. With the introduction of the Argand burner its use became more common. The reflectors at first were plaster moulds made of the proper form, upon the interior surface of which were fastened facets of plane silvered glass. They came into general use in Europe in the early part of the present century. The best form of reflector is the paraboloid of revolution with its axis horizontal. The reflector is made of copper, and its inner surface is covered with silver and is highly polished. The flame of the lamp has its centre in the focus of the reflector, and the rays emerge from the surface of the reflector nearly parallel. They are not entirely parallel, because the surface is necessarily imperfect, and the source of light cannot be a mathematical point. The small divergence, instead of being a defect, is in reality a benefit, for without it the beam would always have a diameter equal to that of the edge of the reflector, and would be of little practical value. In fixed lights, the reflectors are fastened to circular iron frames, and are placed in horizontal tiers in the lantern. There is a lamp for each reflector, and it follows that the greater the number of lamps, the more uniformly the light is distributed around the horizon. The reflectors vary in their sizes. The double ordinate at the lips is about 11 in. in the smallest and 21 in. in the largest size. Some have been made larger, but they have never been in general use. In a revolving reflector light, the reflectors are generally arranged so that the axes of all of them on one face are parallel, and there are two, three, or four faces, the number depending on the desired interval between the flashes. The frame upon which they are placed is made to revolve by a clockwork arrangement moved by a weight. It is evident that the flash produced by one of the faces will be brighter than the light of a fixed reflector light, because the



eye will receive at once rays from several reflectors, while in the case of a fixed light it only receives them from one. This is the reason why revolving lights are always brighter than fixed lights. The lamps used with reflectors are

1, 2, and 3 represent a vertical central section, a side elevation, and a rear elevation of a lamp and reflector: *a a a a* is the reflector; *b*, the burner; *b'*, the glass chimney; *c*, the fountain, holding about two thirds of a quart; *d d d d*,

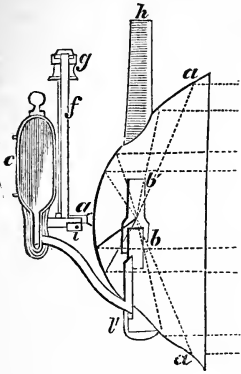


FIG. 1.

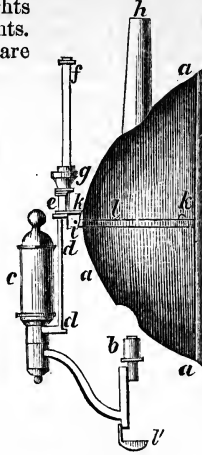


FIG. 2.

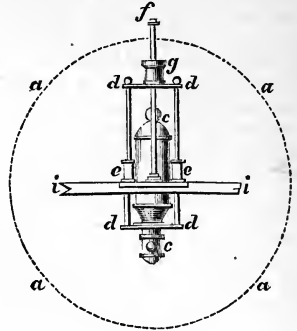


FIG. 3.

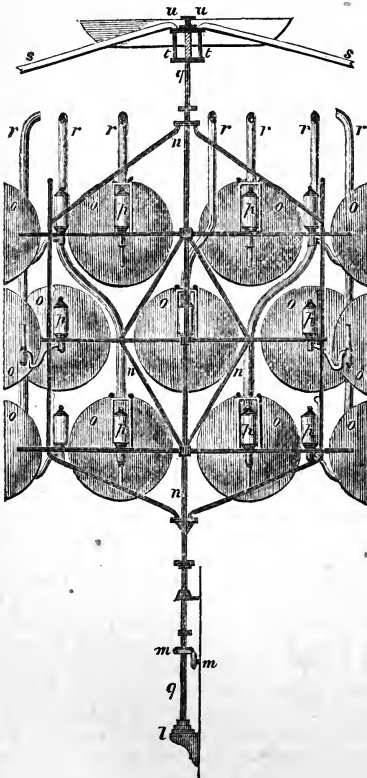


FIG. 4.

what are commonly called fountain lamps. They are fitted with Argand burners, about three fourths of an inch in diameter. Figs.

a frame to which the lamp is fastened; *e* and *f*, guide rods upon which the frame is movable vertically for raising and lowering the lamp; *g*, a handle, by turning which the lamp is fastened in position; *h*, a copper tube for ventilation, which is inserted in an elliptical aperture in the upper part of the reflector, corresponding to one in the lower part through which the burner can be moved out and in; *i*, a portion of the frame to which the lamps and reflectors are attached; *k k*, brass knobs

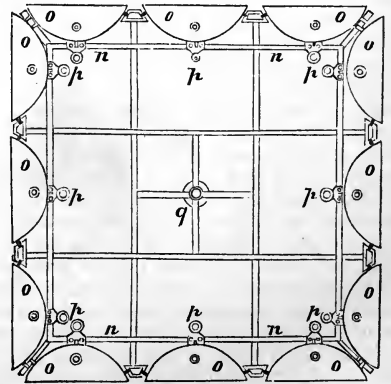


FIG. 5.

soldered to the outside of the reflector; *l*, an iron band upon which the knobs rest, thus holding the reflector in place. Fig. 3 shows the frame *d d* on which the lamp is mounted, the guides *e e* through which the rods slide, the guide rod *f*, and handle *g*; *l'* is the dripping cup. The communication between fountain and burner is opened by giving the fountain one quarter turn, which opens a slide

valve, covering the flow-hole. This flow-hole is about three eighths of an inch below the top of the burner, measured vertically. Figs. 4, 5, and 6 give an elevation of the lamps and reflectors in a revolving apparatus, a plan of the same apparatus, and a plan of the lamps

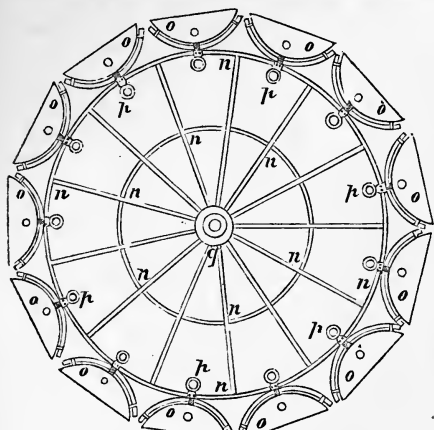


FIG. 6.

and reflectors in a fixed light: *n n n* is the frame; *o o o*, the reflectors; *p p p*, the lamp fountains; *q*, the central shaft; *r r r*, the tubes which lead off the smoke; *s s s*, the braces supporting the shaft; *t t*, supports of the shaft; *u u*, a pan for catching drops from the roof; *l*, a bracket supporting the foot of the shaft; *m m*, bevelled wheels conducting the motion from the apparatus which

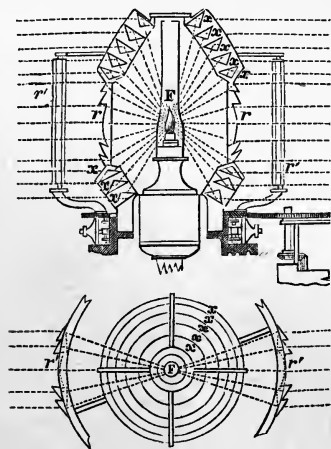


FIG. 7.

moves the system. The introduction of the Fresnel or dioptric method of illumination of lighthouses has superseded the reflector system, so that reflectors are now only used as range lights, or on light vessels, or in lighthouses built with too little money to permit

the purchase of a lens. Fig. 7 shows a plan and elevation of a Fresnel lens of a small order. It consists of thirteen rings of glass of various diameters arranged vertically one above the other. The five middle rings are  $11\frac{1}{8}$  in. in internal diameter, and by two refractions throw the rays which they receive from the flame *F* to the horizon. The five upper and three lower rings throw their rays to the horizon by two refractions and one total reflection. The dotted lines show the courses of the rays after they leave the lamp. *F* is the flame; *r r*, cylindrical refractors; *x x*, catadioptric rings acting by refraction and reflection. The external lines *r' r'* represent a system of vertical prisms which revolve around the apparatus described above, and by deviating the rays as represented in the plan, so that they leave the prisms parallel to each other, cause the variation in the light described in the lists as a "fixed light varied by flashes." The first cost of a lens of the first order is four times as great as that of 20 reflectors, which is the greatest number placed in a lighthouse.

III. AUXILIARY SAFEGUARDS TO NAVIGATION. These consist of light vessels, beacons, fog signals, and buoys. Light vessels are vessels moored to point out dangers or show the entrances of channels, turning points, &c., by exhibiting a light at night. They are strong, and built for riding easily at anchor, and are well manned, to provide against accidents to which their exposed positions render them peculiarly liable. The lighting apparatus is contained in a lantern which at night is hoisted to the masthead. It consists of lamps and reflectors like those described above for lighthouses, except that they are smaller. The lamps are hung on gimbals, so that their positions may be affected as little as possible by the motion of the vessel. During the past ten years Fresnel lenses have been successfully applied to light vessels. Some of the light vessels of the United States are in positions exposed to the full force of the Atlantic, and one moored off the Nantucket New South shoal is 22 m. from the nearest land. On account of the great expense of maintaining light vessels, and the little dependence that can be placed on them as signals when they are the most needed, they are only placed near dangers which it is impossible to point out by lighthouses.—A beacon is a structure of stone, iron, or wood, placed upon the shore or upon a rock or shoal in the water to designate a danger. Beacons are built at points where lighthouses cannot be built, or which are not of sufficient importance to justify the constant expense of keeping up lighthouses or light vessels, but which nevertheless require to be pointed out.—A fog signal is an aid to navigation placed on board a light vessel or near a lighthouse to give warning to vessels in time of foggy or thick weather. They are of the greatest importance, hardly if at all inferior to lighthouses. In fogs no light can be seen far enough to be of

use, and a signal by sound is the only one that can give warning of the presence of danger. Bells are the most common signals, and when placed on light vessels they are very efficient. When, however, they are placed near lighthouses, as the shore is generally between the bell and the vessel to be warned, the roar of the surf is likely to drown the noise of the bell; so that in such cases they are inefficient, and can only be heard when the vessel is close to the lighthouse, often too close to avoid the danger. Whistles, horns, and sirens are also used as fog signals, and are more efficient than bells, because their sounds are heard further. They are sounded by steam or air engines, and their positions are indicated by the lengths of and intervals between the blasts. The siren is actuated by steam or compressed air, and is constructed as follows: There is a hollow flat right cylinder with circular base made of strong metal. In the centre of one of the bases is a hole to which is attached a metal tube connecting the cylinder with the boiler, or reservoir of compressed air. The other base contains eight holes symmetrically arranged about its centre. A plate of metal concentric with this base, and close to it, having in it corresponding holes, is made to revolve with any required velocity. In front of this plate is a large horn, which is in accord with the tone or note made by the siren. Then, when steam or compressed air is admitted into the flat cylinder, the revolution of the metal plate opens and closes the eight holes in the base with great rapidity, producing an intense sound of great volume, which is transmitted in the required direction by the horn. Sounds from the siren have been heard at a distance of 25 m. This instrument has been experimented upon with great success by Prof. J. Henry and Gen. J. C. Duane of the lighthouse board, and forms the best fog signal in the world. The intervals between the sounds can be so arranged as to make each instrument indicative of the station where it is placed. The objection to it is its great expense, as it involves a steam engine and the persons necessary to attend it, with fuel, fresh water, &c. This expense, however, is common to the siren and the ordinary horn with the reed attachment. Constant efforts are made in all civilized countries to increase the efficiency of these signals.—Buoys are anchored in the water to mark rocks, shoals, and other dangers. They are of various kinds, such as nun, can, and spar buoys, &c. A nun buoy is in shape like two equal cones brought together at their bases; it is made like a barrel with staves and iron hoops, or, as is often the case in the United States, it is made of boiler iron. A can buoy is nearly conical in shape, and is moored at its vertex. A spar buoy is a spar anchored at one end. Buoys are painted of different colors to indicate upon which side they must be passed. The colors are fixed by law of congress in the

United States. Thus a red buoy must be left on the starboard hand by a vessel entering a harbor from sea, and a black buoy must be left on the port hand. A buoy with red and black horizontal stripes may be left on either hand. The side of a channel upon which a buoy is placed is sometimes indicated by the kind of buoy. Thus nun buoys may be placed on the starboard side of a channel, and can buoys on the port side. IV. HISTORY AND STATISTICS. Little is known of the early history of lighthouses, but sea lights are mentioned by Homer in the *Odyssey*, and they are also referred to in the Greek poem of Hero and Leander. These must have been merely fires kindled upon headlands. The most noted lighthouse in the world for size and antiquity was the Pharos of Alexandria. This building was the frustum of a square pyramid surrounded by a large base, the precise dimensions of which are not known. It was commenced by the first Ptolemy, and was finished about 280 B. C. The style and workmanship are represented to have been superb, and the material was a white stone. The height was about 400 ft.; and it is stated by Josephus that the light, which was always kept burning on its top at night, was visible about 41 m. It was probably destroyed by an earthquake, but the date of its destruction is not known. Enough is known, however, to make it certain that this tower existed for 1,600 years. The island upon which it is situated was named Pharos, and the structure took its name from its site. To this day the French word for lighthouse is *phare*, and the Italian and Spanish *farro*.—One of the most remarkable modern lighthouses is the tower of Cordouan, which was commenced in 1584 and finished in 1610 by Louis de Foix, the construction having occupied 26 years. It is situated on a ledge of rocks in the mouth of the Garonne or Gironde, in the bay of Biscay. The ledge is about 3,000 ft. long and 1,500 ft. broad, and is bare at low water. It is surrounded by detached rocks, upon which the sea breaks with terrific violence. There is but one place of access, which is a passage 300 ft. wide where there are no rocks, and which leads to within 600 ft. of the tower. The foundation is the frustum of a circular cone whose lower base is 135 ft. in diameter, and is built solid of cut stone to a height of 16 ft., a space for a cellar and water cistern 20 ft. square and 8 ft. deep having been left in the centre. The upper base of the frustum is 125 ft. in diameter. On the E. side is a stone staircase by which access to this upper base is gained. The tower springs from this level. A parapet wall about 11 ft. thick at the top is built entirely around the upper base of the foundation to a height of 12 ft. Between this wall and the tower are the apartments of the keepers. The tower rises from the base to a height of 115 ft., and is 50 ft. in diameter at the base; it diminishes in diameter as it ascends. The apartments of the tower are highly ornamented, and

were not intended for occupation by the keepers. There are four stories, all of different orders of architecture, and adorned with busts and statues of kings of France and heathen gods. The material is stone. The basement or lower story appears to have been intended as a store room; the second story is called the king's apartments; the third is a chapel, and the fourth consists of a dome supported by columns, a kind of lower lantern; above this was originally a lantern formed of a stone dome and eight columns. The total height of the tower from its base to the upper point of the lantern dome was 146 ft., and from the rock 162 ft. In the upper lantern a fire of oak wood was kept burning at night for about 100 years, when, in 1717, the fire having weakened the stone supports by calcining them, the upper lantern was taken down and the light was kept up in the lower lantern. As it did not show well there, an iron lantern was erected in 1727 above this, in the place of the old stone lantern, and coal was used for fuel instead of wood. It is worthy of remark that the upper part of this lantern contained an inverted cone, the base of which was the base of the lantern dome. The surface of the cone was covered with tin plates, thus forming a rude reflector that utilized a part of the light, which without it would have been lost. This was probably the first attempt made in a lighthouse to deviate the rays of light so as to throw to the horizon those which would have been lost in the upper parts of the atmosphere. The Cordouan lighthouse is also notable from the fact that the first Fresnel lens manufactured was placed in it in 1823.—The Eddystone lighthouse (see EDDYSTONE ROCKS) is celebrated on account of the difficulties attending its construction, and the fact that it is the type of all structures of the kind which have since been erected. The Eddystone rocks in the English channel, near the port of Plymouth, are in the fairway of all vessels coasting along the S. shore of England, and the attention of the government was directed to them at an early day. They are a cluster of gneiss rocks 600 or 700 ft. long from N. to S., with detached rocks covering about the same distance from E. to W. The highest part of the rock upon which the lighthouse is placed is about 16 ft. out of water at low water of spring tides. The first lighthouse erected upon them was commenced in 1696 and finished in 1699 by Henry Winstanley. The accounts of its construction are vague, but it is supposed to have had a solid circular and polygonal stone base 12 ft. high and 24 ft. in diameter, upon which was built a structure of wood resembling a pagoda. The height from the rock to the base of the lantern was about 75 ft. The lantern was glazed. This building stood until November, 1703, when Mr. Winstanley went to the lighthouse with a party of workmen to make some repairs. On the 26th of the month a terrible storm arose, and not a remnant of the lighthouse nor a trace of its

inmates was ever seen afterward. The fact that a lighthouse could be made to stand on the Eddystone having been demonstrated, soon after the destruction of Winstanley's building another was built by Rudyerd. It was commenced in 1706 and finished in 1709. It was an ingenious combination of wood and iron, and showed great advances in the art of engineering. The form was the frustum of a circular cone. It was built up nearly solid for a height of 27 ft. above the rock, the filling consisting of courses of cut stone alternating with courses of squared timber. The outside casing was composed of 72 oak posts or uprights, the lower ends of which were fastened to the rock by heavy irons which were let into lewis holes. This is the first recorded application of the lewis for this use. The lantern was glazed. This building stood well with some repairs of the woodwork until December, 1755, when it was destroyed by fire. The fire commenced in the lantern in the early part of the night, and the keepers retreated from room to room until they reached the rock. Early in the morning they were brought to the shore, as the weather happened to be good enough to permit a boat to land on the rock. In 1756 Smeaton was selected to rebuild the Eddystone. He determined to use stone for the material, and the shape of the trunk of a large tree as his model. The stones of a course were joined by dovetailing, and the different courses were connected by stone dowels. The upper surface of the rock was cut in horizontal steps, so that every course of masonry rests upon a horizontal bed. The general form of Smeaton's structure is the frustum of a cone, or more strictly that of a solid of revolution formed by revolving a vertical plane bounded on one side by a concave curve around a vertical axis. The elevation, or a vertical section of the tower, indicates great strength. The diameter of the lowest partial course is 32 ft., and that of the first or lowest entire course is 26 ft. The diameter of the course under the coping is 15 ft., and the whole height of the masonry is 77 ft. The tower is surmounted by a parapet wall 6½ ft. high and 8½ ft. in internal diameter. The combinations devised for obtaining the greatest strength in this tower by dovetail-

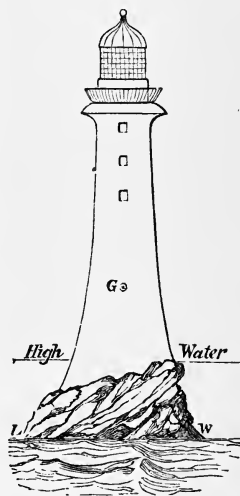


FIG. 8.  
Eddystone Lighthouse.

ing, cramping, dowelling, and by the use of hydraulic mortar, have never been surpassed. The experiments made by Smeaton on hydraulic cements in connection with the construction of this work were particularly valuable, and are still quoted. The erection of the lighthouse was, on account of its position, the difficulty of access to its site, and the fact that Smeaton had determined to build it of stone, attended with the greatest difficulties. The genius and energy of the engineer triumphed over all obstacles, and the work was finished in 1759. It has stood for more than 100 years, a monument of the skill of its designer and builder, and an example to all engineers.—Another noted lighthouse structure is the Bell Rock lighthouse off the E. coast of Scotland.

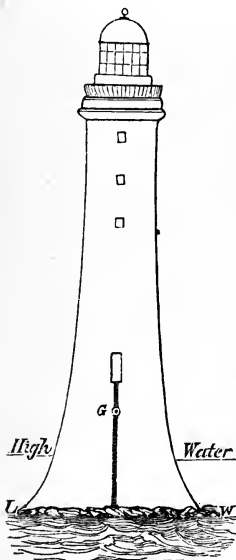


FIG. 9.  
Bell Rock Lighthouse.

This rock is situated in the German ocean, 11 m. from the Scottish coast, on the N. side of the frith of Forth, and nearly opposite that of Tay. It is about 427 ft. long and 230 ft. broad, but the vicinity is dangerous over an area of about 1,400 by 300 ft. The rock is a reddish sandstone, and the part upon which the lighthouse is built is 12 ft. below high water of spring tides, the rise of these tides being 16 ft. The lighthouse is built principally of sandstone found on the mainland in the vicinity, the outer casing of the lowest 30 ft. being of granite. It was commenced in 1807, and was finished late in 1810. The designers were Messrs. Rennie and Robert Stevenson, and it was constructed by the latter. The difficulties of the erection of this lighthouse were nearly as great as those encountered by Smeaton in his work, but the large size of the rock gave it an advantage, and Smeaton's experience was made useful by Stevenson in its construction. The form is similar to that of the Eddystone. The diameter of the bottom course is 42 ft., and that of the course just below the cornice 15 ft. The stone work is 102½ ft. high, in which height is included that of a parapet wall, octagonal in plan, which surmounts the tower. This wall is 6 ft. high, and its sides are 5½ ft. long; upon it the lantern is placed. The account of the erection of this lighthouse, written by Mr. Stevenson and published in 1824, contains an accurate history of the Scottish lighthouses.—The Skerryvore lighthouse,

off the W. coast of Scotland, is also notable on account of the difficulties of its construction. The Skerryvore rocks are situated about 11 m. S. W. of the island of Tyree, and 50 m. from the mainland. They are in the track of large vessels bound from the Clyde and Mersey (Glasgow and Liverpool) around the north of Ireland, and many wrecks have taken place upon them. The erection of a lighthouse was authorized in 1814, but it was not till 1834 that a survey was made, the result of which was the discovery of a solid gneiss rock 160

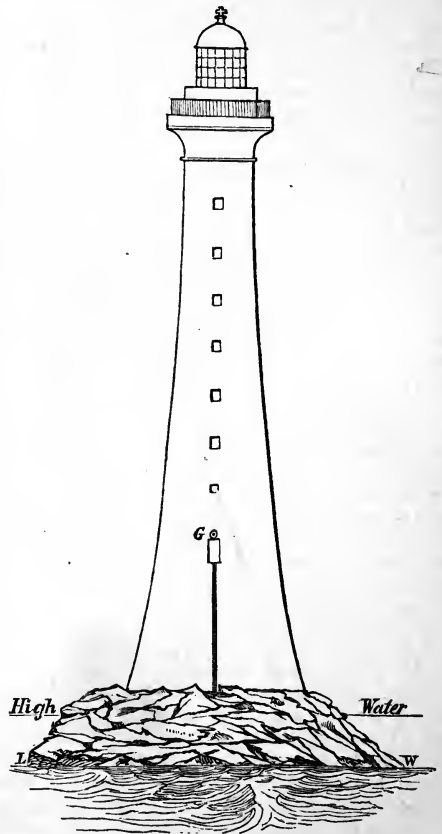


FIG. 10.—Skerryvore Lighthouse.

ft. long and 70 ft. wide, upon which it was determined to erect the lighthouse. Alan Stevenson, a son of the constructor of the Bell Rock lighthouse, succeeded his father as engineer of the commissioners of northern lights, and to him was committed the difficult task of the erection of the Skerryvore lighthouse. The form chosen for the tower is a shaft surmounted by a belt and capital, upon which is the parapet wall. The shaft is a solid of revolution formed by revolving a rectangular hyperbola about its asymptote. The diameter of the lowest course is 42 ft., that



of the top course 16 ft., and the whole height is 138 ft. The tower for a height of 26 ft. is solid. Immediately above the solid part the walls are  $9\frac{1}{2}$  ft. thick, and they gradually diminish from this thickness to 2 ft. The material is granite, and the tower is surmounted by a bronze lantern in which is placed a Fresnel lens of the first order, showing a revolving light. The work was commenced in 1839, and the light was first shown in February, 1844. An account of the construction of the work has been published by Mr. Stevenson, which is valuable not only for the description of this particular work, but because it contains a dissertation on the Fresnel system of lighthouse illumination, and a succinct history of lighthouses. Figs. 8, 9, and 10 show the comparative sizes and shapes of the Eddystone, Bell Rock, and Skerryvore lighthouses. The high and low waters of ordinary tides are indicated on the figures, and the letter G gives the position of the centre of gravity of each tower.—A cast-iron lighthouse for the Great Isaac's rocks, near Bermuda, was completed in 1856, by order of the English admiralty. The tower is 120 ft. high from the base to the plane on which the lantern rests, and 150 ft. to the top of the lantern. At the base the tower is 25 ft. in diameter, and at the top 14 ft. One of the great peculiarities of the construction is that the 155 large cast-iron plates of which it is composed are not placed horizontally round the tower, as heretofore in erections of a similar kind, but in what is technically called "break-joints;" *i. e.*, the plates, so to speak, are dovetailed and wedged the one into the other, in such a manner as to form a perfect column, and equal in strength in all its parts.—Other noted lighthouses have been erected upon the coasts of Europe, but those described are all whose constructions have been given in detail and published to the world, and are types of all others. Some on the coasts of France are as bold in their execution and as difficult in their construction as any noticed above.—Many of the lighthouses in the United States are unsurpassed by any in the world, and are of exceedingly difficult construction. The most noted is that of Minot's Ledge off the coast of Massachusetts. This rock is the outer one of a ledge lying off the town of Cohasset. It is situated about 8 m. E. S. E. of Boston light, and is a projecting point very dangerous to vessels coming into Boston from seaward. Should these vessels have a N. E. wind, and by any chance miss the entrance to the harbor, they would be almost certainly cast away on these rocks were there no signal placed there to warn them off. It is about  $1\frac{1}{2}$  m. from the nearest land, and at low water the highest part of the rock (a circle about 25 ft. in diameter) is bare. The rise of spring tides is not far from 12 ft., so that no part of the rock is ever uncovered more than a few minutes. The difficulties of erecting a lighthouse on this rock were very great. Attention was drawn to the

dangers of this point many years ago, and in 1847 an appropriation was made by congress for the construction of a lighthouse on the rock. It was determined to erect an iron-pile structure, at the top of which was to be the keepers' dwelling, and this was to be surmounted by the lantern enclosing the illuminating apparatus. The plan of the work was a regular octagon, each side of which at the base was  $9\frac{1}{2}$  ft., the diameter of the circumscribing circle being 25 ft. Iron piles 10 in. in diameter where they leave the rock were inserted 5 ft. into it, at each angle of the octagon and at its centre. These were firmly braced and tied together by wrought-iron braces. At a height of 55 ft. above the highest point of the rock the heads of the piles were firmly secured to a heavy casting. Above this casting the floor of the dwelling was placed. The structure was finished in the autumn of 1849, and stood until April, 1851, when it was carried away by one of the most terrific storms that have ever occurred on the Atlantic coast. All of the iron piles were twisted off at short distances above their feet. One cause of the destruction of this lighthouse is supposed to have been a hawser which was fastened to the top of the structure at one end, the other being anchored in the sea. The waves after leaving the lighthouse would strike the hawser, and the effect of the blow was transmitted to the pyramid with very great leverage, causing a tendency to oscillate. Another cause was the ice which froze to the piles, and thus increased the extent of surface exposed to the action of the sea. In 1852 congress appropriated money for rebuilding the lighthouse, and a design was originated by the lighthouse board and approved by the secretary of the treasury early in 1855. It is a granite tower in the shape of the frustum of a cone. The base is 30 ft. in diameter, and the whole height of the stonework is 88 ft. The lower 40 ft. are solid. The remainder of the tower is made up of keepers' apartments, store rooms, and the parapet, which encloses the pedestal of the lens apparatus. The stones of the courses are dovetailed in the securest manner, and the courses are fastened to each other by galvanized wrought-iron dowels, 3 in. in diameter. The work was commenced early in the season of 1855, and an idea of the difficulties to be overcome may be formed from the fact that although advantage was taken of every moment in which it was possible to work upon the rock, it was not until the last part of the season of 1857 that any stones were laid, the whole of the intervening time having been taken up in levelling the foundation bed. In the season of 1857 four stones were laid, in 1858 six entire courses were laid, and in 1859 the whole of the solid portion of the structure and half of the remainder, making a total height of 60 ft., were placed. The lighthouse was finished and lighted at the end of 1860.—The early history of lighthouses in the United

States is involved in obscurity. All built prior to 1789 were ceded to the federal government by the respective states near the time of the adoption of the federal constitution, and the records of the erection and maintenance of the lighthouses before that date are buried among the archives of the several states. It is known, however, that the ports of Portland, Portsmouth, and Newburyport, Cape Ann, Boston, Plymouth, Nantucket, Newport, New London, New York, the capes of the Delaware, the capes of the Chesapeake, the port of Charleston, and the mouth of the Savannah river were all lighted before 1789. The buildings were generally rough stone or wood towers surmounted by large iron lanterns. With few exceptions they have all been rebuilt. They were generally of small height, and the illuminating apparatus was of the rudest description. A new impulse was given to lighthouses in the United States about the year 1845, when a commission consisting of two officers of the navy was sent abroad to examine the lighthouse establishments of European governments. About the same time Mitchell's screw pile was introduced, and the style of reflectors and lamps was much improved. The buildings too were more substantially erected, and more attention was paid to the principle that the light should be brought to the horizon, which when reflectors were first introduced was lost sight of almost entirely. About the year 1852 the general introduction of the lens or Fresnel system of lighthouse illumination was commenced, and all the lighthouses of the United States are now furnished with this apparatus. Under the lighthouse board the principle has been adopted of building all first class lighthouses of fire-proof materials. Although under this system the first cost of the structure is large, an insignificant outlay only is necessary for repairs. The same system obtains in the smaller lighthouses when the amount available for their erection will permit it, but in harbor and pierhead lights light wood or iron structures are erected, which can be rebuilt at a small cost in case of serious damage. On June 30, 1873, there were 641 light stations on the coasts of the United States, including the Atlantic, Pacific, gulf, and lake coasts, and the shores of the various bays, sounds, and rivers. Of these, 620 are lighthouses and 21 light vessels. The expenditures on account of the maintenance of the lighthouse establishment for the fiscal year ending June 30, 1875, are estimated as follows:

Lighthouses.....	\$1,244,980 00
Fog signals.....	60,000 00
Light vessels.....	284,087 50
Buoys and beacons.....	350,000 00
Total.....	\$1,889,017 50

The number of buoys and beacons in the waters of the United States is about 3,000. The buoys must be shifted, cleaned, and painted every season, and those which are in exposed

positions are frequently carried away by heavy seas or ice. The cost of keeping these aids to navigation in an efficient state is no small item in the annual expense of the establishment.— In all governments except that of the United States, commerce is directly or indirectly made to pay for the expense of the lighthouse establishments. In Great Britain a tax is laid upon every vessel, domestic or foreign, that uses the particular light which is to be supported. In some countries a light due is levied, which is constant whether one or more lights have been used by the vessel. In others, as France for instance, a harbor due or tax is levied, with the proceeds of which the lights are kept up, but the necessary amount is appropriated from the public treasury. The tax is always a severe exaction and restriction upon commerce, and it is to be regretted that foreign governments do not in this instance follow the example of the United States, which supports its lighthouse establishment without any tax upon vessels, domestic or foreign. The foreign vessels reap the benefit of our policy, but the favor is not returned to United States vessels. In Great Britain the lights are in charge of three corporations. Those of England are under the Trinity board; those of Scotland and the adjacent islands are under the commissioners of northern lights; and those of Ireland are under the Dublin ballast board. These corporations determine as to the erection or discontinuance of lights in their respective jurisdictions, have entire control of the *personnel*, fixtures, and expenditures of the establishment, and determine the tax to be laid upon vessels which pass or use the lights. The funds raised by this tax are devoted to the annual maintenance and improvement of the lights, though in the case of the Trinity board a part of them may be used for the maintenance of pensioners belonging to the board. In its original construction it is believed this board had nothing to do with the general lighthouse system of England. In France the lighthouse establishment is governed by a mixed board of officers of the *corps des ponts et chaussées*, naval officers, and scientific civilians, and is presided over by the minister of public works. The expense of the maintenance of the establishment is paid by the government, but, as before stated, a tonnage tax is laid upon all vessels, the proceeds of which are expended in the construction and repair of piers, breakwaters, lighthouses, &c. In the other countries of Europe the lighthouse establishments are all connected with the governments, and are managed in various ways. In Russia, Sweden, Denmark, Belgium, and the states bordering upon the Mediterranean, they are generally under the charge of the navy departments. In the United States the establishment is under the control of a board, consisting of two officers of the navy, two officers of army engineers, two civilians of high scientific attainments, and an officer of the navy as secretary. The secretary of the treasury is ex

*officio* president of this board, and its decisions are in all cases subject to his control. The lighthouse establishment is therefore a branch of the treasury department, and its annual expenses are estimated for by that department. For the proper administration of the affairs of the establishment, the coasts of the United States are divided into 13 lighthouse districts. To each of these districts is assigned an inspector, who is detailed from the officers of army engineers and the navy. These inspectors have the control of the operations of the establishment in their respective districts (with the exception of the appointment of light keepers), and correspond directly with the lighthouse board. They are furnished with steamers in which they make quarterly inspections of the light stations in their districts, and which are also used for taking care of buoys. They are required to make annual reports of the condition of their districts, in which are embodied their recommendations of new lights, &c., for the action of the lighthouse board. The construction of new lighthouses and important repairs of old ones are carried on under the direction of officers of the corps of army engineers, who are detailed for this service. The routine duties of the board are discharged by two secretaries, one of whom is an officer of the navy, and the other an officer of the corps of army engineers. Meetings of the board are held weekly for the transaction of the routine or any other business that may be brought before it by the action of the treasury department. The meetings are held at Washington, where the office of the board is situated.

**LIGHTNING**, the illuminating flash produced by the discharge of atmospheric electricity, either between two clouds, or between a cloud and the earth, usually accompanied by a noise called thunder. It manifests itself in various forms, which have been called forked, zigzag, ball, sheet, and heat lightning. Zigzag lightning is produced by the discharge of a large quantity of electricity from a cloud through a resisting medium, which becomes compressed at various points and thus turns the current aside. As shown in the article **ELECTRICITY**, experiments demonstrate that the more air is rarefied, other things being equal, the more readily will it permit the passage of the electric current, and the more it is compressed the more resistance it offers. Ball lightning has the appearance of a ball of fire, accompanied by a terrible explosion, and results from an unusually intense charge of electricity which forces a direct path. It has been supposed by some that the ball is an agglomeration of particles of ponderable matter which have been carried along with the current. Sheet lightning has the appearance of a diffuse glare of light, sometimes illuminating the edges and sometimes the whole surfaces of clouds. It may be caused by a stroke of zigzag lightning at a great distance, sending its light through great thicknesses of clouds, so as to give it the

appearance of diffuseness; or it may result from the passage of electricity of no great tension from particle to particle, like that produced in discharging an electrical machine over the surface of a bedewed pane of glass. Heat lightning differs but little from sheet lightning, being produced in the same two ways. When produced by the reflection or transmission of zigzag lightning, thunder is not heard on account of the distance. The color of lightning varies like that of the spark of the electrical machine when passed through the receiver of an air pump in various states of exhaustion, or when it contains different gases and vapors.—Of the nature of lightning the ancients knew nothing. Its disastrous effects were associated rather with the terrific sound of the thunder than with the flash, and the Greeks and Romans attributed them to the thunderbolt hurled by Jupiter to the earth. The Hebrews often represented them as direct exhibitions of divine power, and frequently in the Old Testament, as in Job xxxvii., the thunder is spoken of as the voice of the Lord. Even the earlier electricians did not suspect the identity of lightning and electricity. The abbé Nollet in 1746 first drew attention to the similarity of effects exhibited by thunder clouds and the prime conductor of an electrical machine. Winckler next argued that the principle of the powers of each was identical. Franklin established the fact first by enumerating in a clear and methodical manner the various points of resemblance, and the similar effects produced by each, and finally by actually conducting the lightning to the earth in his well known experiment with the kite in Philadelphia. The following quotations from letters of Franklin written in 1749-'50, and contained in the "Observations on Electricity" published in London in 1869, are full of interest: "Where there is a great heat on the land in a particular region (the sun having shone on it perhaps for several days while the surrounding countries have been screened by clouds), the lower air is rarefied and rises; the cooler, denser air above it descends; the clouds in the air meet from all sides and join over the heated place, and if some are electrified, others not, lightning and thunder succeed and showers fall. Hence thunder gusts after heats, and cool air after gusts. . . . As electrical clouds pass over a country, high hills and high trees, lofty towers, spires, and masts of ships, chimneys, &c., as so many prominent points draw the electrical fire, and the whole cloud discharges there. Dangerous is it, therefore, to take shelter under a tree during a thunder gust. It is safer to be in the open fields for another reason. When the clothes are wet, if a flash in its way to the ground should strike your head, it may run in the water over the surface of your body, whereas if your clothes were dry it would go through the body. . . . Sulphurous and inflammable vapors arising from the earth are easily kindled by lightning. Besides what arise from

the earth, such vapors are sent out by stacks of hay, corn, or other vegetables which heat and reek. . . . Now if the fire of electricity and that of lightning be the same, as I have endeavored to show in a former paper, and a tube of only 10 ft. long will discharge its fire at two or three inches distance, an electrified cloud of perhaps 10,000 acres may strike and discharge on the earth at a proportionally greater distance. . . . I say if these things are so [speaking of the discharging power of points], need not the knowledge of this power of points be of use to mankind in preserving houses, churches, ships, &c., from the stroke of lightning, by directing us to fix on the highest parts of those edifices upright rods of iron made sharp as a needle, and gilt to prevent rusting, and from the foot of the rods a wire down the outside of the building into the ground, or down round one of the shrouds of a ship, and down her side till it reaches the water? Would not the pointed rods probably draw the electric fire silently out of the cloud before it came near enough to strike, and thereby secure us from the most sudden and terrible mischief?" It was not till three years afterward that Franklin actually made the experiment of drawing electricity from the clouds, and demonstrating the identity of atmospheric lightning and frictional electricity. He had proposed various experiments, such as the erection of tall rods on the tops of spires. Dalibard in France, acting according to the instructions of Franklin, on May 10, 1752, obtained electrical sparks from an iron rod 40 ft. high in the garden at Marly, and charged Leyden jars from the same source. Franklin did not make his experiment with the kite till the 15th of June of the same year. These experiments were regarded with the highest interest by scientific men, and were repeated with various modifications in different parts of Europe. Prof. Richman of St. Petersburg, July 26 (Aug. 6), 1753, while explaining to a companion the construction of an electrometer attached to his conductor, was struck and instantly killed by what appeared to be a ball of blue fire as large as a man's fist, that was seen to leap from the insulated conductor to his head, a space of about a foot. A red mark was left on his forehead, his shoe was burst open, and his clothing slightly singed. His companion was benumbed and rendered senseless, and the door case and door were torn apart by the shock. M. Romas, to whom the French academy of sciences awarded the merit of inventing the electrical kite more than a year before it was employed by Franklin, constructed a kite 7 ft. 5 in. high, and 3 ft. in its greatest width, with a surface of 18 sq. ft. A copper wire was wrapped around the string to increase its conducting power, and this was made to terminate in an insulating silk cord, near which an iron tube was placed to receive the electricity. The kite being raised to a height of 550 ft. on the approach of a storm, the iron

conductor became so highly charged that electrical sparks were obtained, and shocks of great violence. As the storm increased, flashes of fire darted to the earth accompanied with explosions, and straws that happened to be on the ground were attracted alternately by the string and the ground, their movements being accompanied by electrical flashes and constant explosions. Such were the experiments by which the electrical nature of lightning was established, and the thunder proved to be the noise which accompanies the electrical discharge. This sound may be prolonged as it is reflected in echoes by the clouds; or, as suggested by Sir John Herschel, it may come in successive impulses to the ear, as brought from an instantaneous discharge that extends for miles along a line directed away from the observer. So the terrific sudden crash may be the result of a flash occurring all round the observer with no great difference of distance from him in the points of the discharge. Not only was the electrical condition of the atmosphere during thunder storms thus established, but in 1753 the abbé Mazeas, by means of a wire 370 ft. long attached to a steeple at Maintenon, proved that electrical action is excited in clear, dry, and especially hot weather, at all hours between sunrise and sunset.—From a multitude of observations made by Cavallo, Read, De Saussure, and others, it appears that the atmosphere is almost always positively electrified in relation to the surface of the earth, and the higher the stratum of air the more decidedly positive is its electrical condition. The source of atmospheric electricity is traced by Lavoisier, Laplace, Volta, and De Saussure to evaporation from the surface of the earth, the effect of which is to convey one kind of electricity upward with the vapor, leaving the other with the fluid. But, as shown by Pouillet in 1823, this effect does not take place unless the evaporation is accompanied with chemical decomposition, as when it occurs from saline mixtures, from the surface of heated iron, which becomes oxidized, and more especially when the vapor proceeds from the leaves of growing plants. Combustion also is a source of atmospheric electricity, as is seen upon a large scale in the constant flashes of lightning that sometimes play around the summits of volcanoes during their eruptions. The rushing of currents of wind past each other, or against opposing objects, also generates electricity by the friction it occasions. The descent of the rain drops develops negative electricity in the air, and the same effect is observed in the vicinity of waterfalls, the air for several hundred feet distant being filled with negative electricity. To this cause is probably to be attributed the highly excited condition of the atmosphere during thunder storms, and the frequent alternations then observed of positive and negative indications. However the electrical condition of the clouds is produced, the surface beneath assumes the opposite electrical

state, the stratum of air between acting like the insulating glass plate between the two metallic surfaces; and when at last the attraction between the two opposite electricities becomes too strong for the interposed medium to resist, they rush together, producing the disruptive discharge accompanied with the flash and report. With a good conductor passing from the cloud to the earth, the electrical equilibrium would be silently restored, as a Leyden jar is quietly discharged by connecting its inner and outer surfaces with a wire pointed at each end. But if an imperfect conductor is interposed, the electricity, seeking to follow this, may produce the most violent effects, and these are exhibited at the points where the continuity of the conductor is imperfect or interrupted. This is well illustrated in the common experiment with the model of a house loosely put together and furnished with an interrupted rod, through which an electrical shock is conveyed. The effect is to throw the model into pieces; but when the same experiment is tried upon a complete rod, the discharge takes place without violent action. Sir W. Snow Harris also illustrates the effect of an interrupted conductor by scattering bits of gold leaf upon paper, and passing along them an electrical discharge, sufficient to burn the gold and blacken the paper. But it is observed in this experiment that only those bits are burned, and the portions of them only, which lie along the line of most perfect conduction or of least resistance; the paper too will be nowhere blackened except on this line. Similar phenomena are observed upon a large scale in almost every instance of a house being struck by lightning. The path of the electrical current is traced along the best conductors, and as the lightning passes from one to another the most destructive effects are observed in these breaks. Imperfect conductors lying near are shattered to pieces or scattered about, and the effects of intense heat are developed where the current is most obstructed. The animal system offering a good conductor, the lightning leaves more imperfect ones to pass by this on its course, and thus men and beasts are frequently struck when standing near projecting objects, as trees, that present themselves as convenient mediums for the reestablishment of the electrical equilibrium.—Franklin, having satisfied himself of the identity of lightning and electricity, was not long in drawing from his discovery practical results of immense importance in protecting buildings from the stroke of lightning; and he thus announced in his "Poor Richard's Almanac" for 1753 his invention of the lightning rod, the description being nearly as complete and exact in all its essential particulars as could now be given after the experience and trials of more than a century: "*How to Secure Houses, &c., from Lightning.* It has pleased God, in his goodness to mankind, at length to discover to them the means of securing their habitations and other buildings from mischief

by thunder and lightning. The method is this: Provide a small iron rod (it may be made of the rod iron used by the nailers), but of such a length that one end being 3 or 4 ft. in the moist ground, the other may be 6 or 8 ft. above the highest part of the building. To the upper end of the rod fasten about a foot of brass wire, the size of a common knitting needle, sharpened to a fine point; the rod may be secured to the house by a few small staples. If the house or barn be long, there may be a rod and point at each end and a middling wire along the ridge from one to the other. A house thus furnished will not be damaged by the lightning, it being attracted by the points, and passing through the metal into the ground without hurting anything. Vessels also having a sharp-pointed rod fixed on the top of their masts, with a wire from the foot of the rod reaching down round one of the shrouds to the water, will not be hurt by lightning." Thus Franklin merited the words of the French medal subsequently struck in his honor, *Eripuit celo fulmen*, though from a passage found among the fragments of Ctesias (*Photii Bibliotheca*), it would seem that some knowledge was possessed by the ancients, 400 years before the Christian era, of the effect of iron rods in averting the lightning. The writer in this passage makes mention of a fountain in India, from the bottom of which was obtained a kind of iron, which being set in the ground averted clouds, hail, and lightning. Various modifications in the construction of the rod have since been proposed, and copper has been advantageously substituted for iron, as in those planned by Sir W. Snow Harris for the use of the ships of the royal navy. These protectors are in bands of copper, overlapping each other so as to break joints, and are let in to the after side of each mast. They pass down to the keel, and are continued through this by copper bolts into the water; they also connect with copper bands laid under the deck beams and continued through the side of the ship. Harris also made conductors for buildings of copper pipes firmly screwed together, and furnished at top with a pointed extremity  $1\frac{1}{2}$  ft. long and  $\frac{1}{4}$  in. in diameter. The tubes for a given amount of metal expose the greatest surface, and thus furnish the maximum capacity of conduction of the electrical current. Copper moreover conveys the current more freely than iron in the proportion of 12 to 2 $\frac{1}{2}$ . This is an important feature, inasmuch as, having no measure of the power of the current that may strike the rod, we should provide one of sufficient size for any stroke. An iron wire may be entirely inefficient, and melt beneath the electrical current, or this may be divided and bound off to other more or less perfect conductors near the rod. It is this inefficiency or imperfect construction of rods in use that has led many to question the value of any metallic conductors, and even to imagine that they all serve to attract lightning, and thus increase the dan-



ger. Their office is that of conductors of the electrical current, as the bed of a river presents itself for the flow of the aqueous current. Each may act as a safety valve to its respective current when this is impelled with unusual violence; and in case of obstruction to either disastrous consequences may ensue. Iron rods loosely jointed together, and perhaps rusty in the joints, furnish a bad conveyance for the electrical current; and if not continued down into moist ground, and there branching out, the passage of the electricity into the earth may not be so free as by other conductors in the building itself. Wrought-iron rods are commonly used in the United States on account of their greater cheapness. They should be at least three fourths of an inch in diameter, and in as long pieces as is practicable. The joints that cannot be avoided should be very securely fitted, so that the two ends are brought into close contact, and touch each other for several inches in length. The branching terminations in the ground may very well be filled around with charcoal, which is a good conductor, and also protects the rod to some extent from rusting. The points at the top may be protected from rust by gold leaf, and the whole rod may be painted with black paint having lampblack for its chief ingredient. A good rod may be secured without danger to the building by wooden clamps with iron fastenings, or even with iron staples. Glass insulators are useless, for when wet they become conductors. It is recommended by some persons, that as the greatest number of thunder storms in this country come from the northwest, the conductors should be placed on the side of the building exposed to their first approach. But it is particularly important that every prominent elevated point of a large building should be protected by its own rod, and it is well to connect all the rods together, and to have two or more stems running into the ground. It is very uncertain how large an area a rod of given height can protect. Different French electricians have variously rated it as a circular space of radius from one to three times the height of the rod above the highest point to which it is attached; but little confidence can be placed in these conclusions. The opposite electricities, the concurrence of which produces the discharge, are far from being uniformly distributed through the atmosphere, and their point of rushing together may not be in any way under the influence of a rod directed into the air in its vicinity. The position of the excited masses may be favorable for a lateral discharge, and such have been known to pass horizontally through the atmosphere long distances, and to strike with destructive violence objects lying in their path. And as evidence of the protecting influence of a single point not reaching to any considerable distance, a case is cited of the foremast of a ship being struck, causing serious damage to the vessel, when the mainmast was provided with a conductor. Hence the importance of points upon

the rods along the salient parts of buildings they are designed to protect. By the great multiplication of conductors the accumulation of opposite electricities in quantities sufficient to produce destructive discharges is prevented; and thus it is that houses in cities are rarely struck, or vessels where many are lying together in the docks. Isolated houses are more commonly the objects of the lightning stroke; and it is observed that particular localities are subject to be repeatedly struck at different periods; other spots are singularly free from such visitations. Chimneys from which hot and rarefied air is ascending into the atmosphere, and barns stored with new hay, the vapors from which also produce warm ascending currents, are especially liable to be struck. It is prudent for persons in a building to avoid being near a chimney or the walls, or in close proximity to metallic bodies, along which the lightning may find the readiest path. The greatest safety would be found, as stated by Franklin, in lying in a hammock suspended by silken cords in the middle of a large apartment. Insulation by placing one's self upon a feather bed, or any poor conductor, is also a protection, not however complete unless the head is covered by some non-conducting substance. The efficacy of lightning rods is sometimes doubted, and an idea entertained that the rod often proves dangerous by attracting the stroke. It is difficult to say how many buildings have been saved by rods, as it is impossible to say what might or might not have taken place in their absence. It appears however that in Germany statistics have lately been furnished by insurance companies which support the opinion that rods offer a great degree of protection. It has been found that the first point struck by lightning is that at which the greatest heating effect is produced, and that if no inflammable materials are present there, the danger of fire following the stroke is greatly diminished. Inflammable vapors form better conductors than the air, and if no rods are furnished to buildings when such vapors are issuing they are liable to be struck, and when struck more liable to take fire than if supplied with rods. The English association of telegraph engineers have furnished still more valuable information. The poles of their lines were frequently struck until they mounted them with wire running from the top to the ground. They have found that it is well to have a large mass of metal in the ground connected with the wire, and that the latter should be as straight as possible. The rod should be continuous, and present no points except at the top; insulation under such circumstances is not necessary.—One of the most useful works for reference in regard to lightning and lightning rods is the treatise of Sir W. Snow Harris "On the Nature of Thunder Storms, and on the Means of Protecting Buildings and Shipping against the Destructive Effects of Lightning" (London, 1843).

**LIGIER, Pierre**, a French actor, born in Bordeaux in 1797, died there, Sept. 28, 1872. A glazier by trade, he first performed in Paris at the Théâtre Français in 1819, under the auspices of Talma, being his last pupil. Subsequently he succeeded so well in the personation of Marino Falieri and other kindred parts, that in 1831 he was admitted to the association of the Théâtre Français. His most admirable representation was that of Richard III. He was the last exemplar of the method of Talma, and despite his physical disadvantages he produced great tragical effects, especially in the delineation of fierce passions.

**LIGNE**. I. **Charles Joseph**, prince de, an Austrian general, son of Claude Lamoral II., viceroy of Sicily, and descended on his mother's side from Mary, queen of Scots, born in Brussels in May, 1735, died in Vienna, Dec. 13, 1814. His father and grandfather, members of a princely house which was settled in Hainaut as early as the 11th century, had both been field marshals of Austria, and he entered his father's regiment as ensign in 1752. In 1756 he became a captain, and distinguished himself during the seven years' war. His bravery at the battle of Hochkirch in 1758 gained him the rank of colonel. He was made major general in 1765, and lieutenant general in 1771. In 1782 he was sent on diplomatic business to Russia, where Catharine II. loaded him with favors and gave him a large estate in the Crimea. In 1788 he was appointed general of artillery by Joseph II., and in the following year he had an important share in the taking of Belgrade by Laudon. He lost favor at court in consequence of his son's participation in the rebellion of the Low Countries against Austria in 1790; and although he obtained the rank of field marshal by regular promotion in 1808, he was never restored to active service. The last years of his life were passed chiefly in literary pursuits. His works are nearly all included in his *Mélanges militaires, littéraires et sentimentaires* (34 vols. 12mo, Vienna and Dresden, 1795-1811), and in his *Œuvres posthumes* (6 vols. 8vo, 1817). The former series Mme. de Staël abridged in two interesting volumes entitled *Lettres et pensées* (Paris, 1809). II. **Engène Lamoral**, prince of Amblise and of Épinoy, a Belgian statesman, grandson of the preceding, born in Brussels, Jan. 28, 1804. After the revolution of 1830 his name was mentioned in connection with the throne of Belgium. In 1838 he represented his country at the coronation of Queen Victoria. He was ambassador to France from 1842 to 1848, and to Italy in 1848 and 1849. He became a member of the senate in 1851, subsequently its president, and in 1863 a minister of state, positions which he still held in 1874.

**LIGNITE**. See BROWN COAL.

**LIGNUM VITÆ**. See GUAIACUM.

**LIGNY**, a village of Belgium, in the province and 13 m. W. N. W. of the city of Namur. It has given its name to the battle fought

there between Napoleon's army and the Prussians under Blücher, on June 16, 1815, two days before the battle of Waterloo, and almost simultaneously with the engagement on the neighboring spot of Quatre-Bras, in which the duke of Brunswick fell. A short time before the commencement of the action at Ligny, the duke of Wellington met Blücher there, and foretold his defeat. After a desperate resistance, the Prussians were driven with a heavy loss from their position; but Blücher maintained his communications with the English and made good his retreat, and no beaten army ever rallied quicker.

**LIGUORI, Alfonso Maria da**, a saint of the Roman Catholic church, born at Marianella, near Naples, Sept. 26, 1696, died in Nocera, Aug. 1, 1787. He belonged to a noble family, and was bred to the profession of the law; but in 1722 he became a priest, and henceforth devoted himself to the instruction and reform of the more ignorant and vicious classes of the population, particularly in country places. To this end he founded at the hermitage of Santa Maria de la Scala in 1732 a congregation to which he gave the name of the Most Holy Redeemer. In 1762 Pope Clement XIII. raised Liguori to the see of Sant' Agata dei Goti, which he governed for 13 years, when at the age of 79, being deaf, almost blind, and afflicted with a painful malady, he resigned and retired to one of the houses of his congregation, where he ended his days. In theology he was a warm opponent of Jansenism and rigorism. He was remarkable for his profound contempt for all exterior show, for the extreme austerity of his life, his apostolic zeal, and activity in reforming abuses. He was highly esteemed by the kings of Naples, the bishops and cardinals of his time, and the popes. The veneration of the people for him, especially in his old age, was unbounded. He was canonized by Gregory XVI., May 26, 1839. His statue has been placed in St. Peter's, and he is one of the patron saints of Naples. He was raised to the rank of "doctor of the church" by Pius IX. in 1871. He left a number of theological and devotional works, including *Theologia Moralís* (Naples, 1755); *Directorium Ordinandorum* (Venice, 1758); *Opera Dogmatica* (1770); *Is-toria di tutte l'eresie con loro confutazione* (3 vols. 8vo, 1773); *Istruzione pratica per i confessori* (3 vols. 12mo, Bassano, 1780); *Homo Apostolicus Instructus in sua Vocazione* (3 vols. 4to, Venice, 1782); and *Le glorie di Maria* (2 vols. 8vo, 1784). His complete works, translated into French, were published in Paris in 30 vols. 8vo (1834 et seq.). Many of his devotional works have been translated into English, and frequently republished.

**LIGURIA**, in ancient geography, a district of northern Italy, which according to the divisions of Augustus was bounded N. by the Padus (Po), E. by the Macra (Magra), separating it from Etruria, S. by the Ligurian sea (gulf of Genoa), and W. by the Varus (Var) and the

Maritime Alps, separating it from Transalpine Gaul. It thus embraced the whole modern province of Genoa, the territory of Nice, and some adjoining parts, a mountainous country traversed by the Alps and Apennines, whose most important products were cattle and timber. The inhabitants, called Ligyes by the Greeks and Ligures by the Romans, were a strong, active, and warlike people of uncertain origin, some identifying them with the Celts, others with the Iberians, and still others with the Siculi. In early times they were widespread, occupying among others the southern coasts of Gaul, and are even mentioned by Hesiod as one of three principal nations of the earth. Eratosthenes and Strabo call the whole west of the European continent Ligystice (Liguria). The Romans divided them into Transalpine and Cisalpine Ligurians, calling the inhabitants of the maritime range *Alpini* and those of the Apennines *Montani*. Their tribes on both sides of the Alps were numerous. Their country was first invaded by the Romans during the period which elapsed between the first and second Punic wars, but it was not till some years after the termination of the latter that the final and fierce struggle was commenced which terminated with their subjugation and the transplantation of some of their tribes to Samnium. Among the principal towns of Liguria under the Romans were Genua (Genoa), Nicæa (Nice), Polentia (Polenza), Asta (Asti), and Dertona (Tortona). (For the Ligurian Republic, see GENOA.)

**LILAC**, an ornamental flowering shrub, the name of which is said to have been introduced with the plant. It belongs to the genus *syringa*, of the olive family; the generic name is from the Greek for pipe or tube (*σῦριξ*), on account of the tubular form of the flowers, or according to some because the wood is used for pipe stems; this latter seems the more probable, as a century ago the lilac and the shrub now cultivated as the mock orange (*Philadelphus coronarius*) were both known in English gardens as pipe tree; it is singular that the botanical name for the lilac is retained as one of the popular names for *Philadelphus*, which is frequently called syringa. The lilac has opposite leaves with scaly buds in the axils, but a terminal bud is rarely formed, so that each branch has a pair of buds at its tip. The flowers, which appear in early spring, are in large pyramidal panicles, and are delightfully fragrant; the corolla has a long tube, with a salver-formed, four-lobed limb; stamens two, attached to the tube of the corolla; fruit a two-celled capsule, with one or two slightly winged seeds in each cell. The best known species is the common lilac (*S. vulgaris*), which was formerly supposed to be exclusively a native of Persia, but it is also found wild in eastern Europe; it was introduced into European gardens in 1597 by way of Constantinople. As commonly seen in old gardens, the lilac forms a dense thicket on account of the numerous suckers it produces, but if these

are kept subdued it may be made to form a tree 20 ft. or more high, with a clear trunk; it is not regarded as a long-lived tree; it has been used to form hedges, but is objectionable from its tendency to spread. The suckers afford a means for readily propagating the plant, but new varieties are obtained by seed. The normal color of the flowers is a pale dull blue, with a slight admixture of red, known in the nomenclature of tints as lilac color; the varieties are white, red, violet, &c., and there are those with double flowers; among the finest varieties is that known as Charles X., with enormous panicles of the finest color. The Persian lilac (*S. Persica*) is a small slender shrub, from 3 to 6 ft. high, with lance-ovate



Charles the Tenth Lilac.

leaves and looser clusters of flowers, of a paler color than the common; there is a white variety of this, and varieties in which the leaves are much cut and divided. Jósika's lilac (*S. Josikæa*) has wrinkled and darker foliage than the common, and bluish-purple flowers without odor, and blooms much later than any of the forms of *S. vulgaris*, to which species some are disposed to refer it. A Himalayan species, *S. Emodi*, is in cultivation, but not superior as an ornamental plant to the best forms of the common lilac. Another doubtful species, *S. dubia*, which has also received the name of *S. Rothogamensis*, is by some considered a hybrid between the common and the Persian. As ornamental garden shrubs all the lilacs are popular, and are hardy and easily managed. In France

the lilac is largely used for forcing, the clusters of white lilacs being very popular as winter flowers and for holiday presents. The forcing is done in board structures with a strong artificial heat; the flowers develop in the dark, and the varieties are used indiscriminately, as when produced under these conditions the flowers of all are white.

**LILBURNE, John**, an English agitator, born at Thickney Puncharden, Durham, in 1618, died in 1657. He was apprenticed at 12 years of age to a clothier in London, from whom as well as from his father he imbibed opinions in opposition to the existing hierarchy. In 1636 he went to Holland for the purpose of getting Dr. Bastwick's pamphlet against the bishops printed; and he subsequently privately circulated this publication, with others of a similar character, in England. Having been betrayed by an associate, he was arraigned before the court of the star chamber, and was condemned, in February, 1637, to receive 500 lashes, to be pilloried and confined in the Fleet prison, and to pay a fine of £500 and give security for his good behavior. His fearless bravery on this occasion when confronted with his judges gained him the name of "Free-born John." Four years later the house of commons declared the punishment illegal, barbarous, and tyrannical; and as a reparation he subsequently received from parliament £3,000 out of certain sequestered estates. Upon the establishment of a parliamentary army he enrolled himself as a volunteer, and fought at Edgehill and Brentford. At the latter place he was taken prisoner, and would have been executed as a rebel had not Essex, the parliamentary general, threatened retaliation on royalist prisoners. Disliking the Presbyterian tendencies of Essex, he obtained a commission as major of foot under the earl of Manchester, and subsequently, as lieutenant colonel of dragoons in Manchester's own regiment, fought at Marston Moor. For his intemperate language and publications against Prynne, Lenthal, and other Presbyterian leaders, he was committed to Newgate on a charge of seditious practices. On this occasion Marten interfered in his behalf. He took an active part in organizing the "Levellers," and his pamphlets appealing to the fanaticism of the soldiery were a leading cause of the disaffection which prevailed in the army in 1648-'9. He accused Cromwell and Ireton of a design to usurp the sovereignty; and for reading to a numerous assemblage at Winchester house a pamphlet entitled "England's New Chains," he was in March, 1649, committed by order of parliament to close custody in the tower, whence his political pamphlets issued without cessation. Various unsuccessful attempts were made to conciliate him. He was tried in October by a common jury, a special commission of members of parliament being appointed to determine his sentence, and was acquitted, the populace celebrating the event by bonfires all over London. A medal com-

memorating the trial was subsequently struck, having the following inscription: "John Lilburne saved by the power of the Lord, and the integrity of the jury, who are judges of law as well as of fact." He soon after retired to Holland, but returned to England in 1653, and was again arrested, tried, and acquitted. Finally he settled in Eltham, Kent, and joining the Quakers preached the doctrines of that faith until his death. An account of his trial, entitled "Truth's Victory over Tyrants," was published in 1649.

**LILLE**, or *Lisle* (originally *L'Isle*, the island; Flem. *Ryssel*), a fortified city of France, capital of the department of Le Nord, formerly of French Flanders, 7 m. from the Belgian frontier, 58 m. S. E. of Calais, and 127 m. N. N. E. of Paris; pop. in 1872, 158,117. The annexation of several adjacent communes in 1858 more than doubled its population. It is traversed by the river Deule and connected with the sea by a canal, and has ample railway communication. The fortifications of Lille are considered to be Vauban's masterwork, and the city is one of the most important of France, both in a military and industrial point of view. It has seven gates, one of which has a triumphal arch in honor of Louis XIV., and contains more than 30 public squares and as many bridges. The hôtel de ville was mostly rebuilt in 1849, but a brick Gothic gate house with towers is part of a palace built by John the Fearless, and inhabited by the emperor Charles V. Part of the building is devoted to a school of art, containing in its collection of drawings by old masters 86 by Raphael and nearly 200 by Michel Angelo. Lille is the seat of the prefect and other departmental authorities, a military division, a court of primary jurisdiction, a commercial court, a chamber of commerce, a lyceum, an academy, a medical and pharmaceutical school, schools of design, sculpture, and architecture, a botanical garden, and several literary societies. Lille rivals English manufacturing towns in the spinning of cotton; there are more than 30 establishments for the purpose in active operation. Flax is largely grown in the vicinity, and the manufacture of linens is the most important branch of industry; ribbons and woollens are also produced; but the manufacture of tulles and cotton lace has greatly declined. The tobacco manufactory of the government produces about 11,000,000 lbs. annually. The trade in domestic products, and in wine, oil, madder, and brandies, is very brisk. Fairs are held annually in February and December. —Part of the site on which the city now stands is said to have been anciently occupied by a castle built by Julius Caesar. The city was founded in the 9th century, and it was enlarged and fortified in the course of the 11th. Henry III. of Germany seized it in the middle of the 11th century, and Philip Augustus of France in 1213. Destroyed by the latter on account of the revolt of the citizens, Lille was rebuilt by the countess Jeanne. In 1297 it was conquered by

King Philip the Fair. Afterward it alternately gave its allegiance to France and the counts of Flanders until the end of the 14th century, when it passed into the possession of the house of Burgundy. In the latter part of the 15th century it passed into that of Austria, and in the next century to Spain; but Louis XIV. reconquered it in 1667, and made it the capital of French Flanders. In 1708 Lille was taken by Prince Eugene and the duke of Marlborough, notwithstanding the heroic defence of Marshal Boufflers. It was restored to France by the peace of Utrecht in 1713. It was besieged in 1792 by the Austrians, who after a heavy bombardment, which destroyed many houses, were repulsed with great loss by the citizens.

**LILLEBONNE** (Lat. *Juliobona*), a city of France, in the department of Seine-Inférieure, on the river Bolbec near its confluence with the Becquet, 19 m. E. of Havre; pop. in 1866, 5,049. It occupies a fine site in a beautiful valley, but has a dull sombre appearance, the most of its buildings being clumsy structures of wood, with long monotonous fronts. Almost all its inhabitants belong to the working class, and are employed in its numerous cotton and linen factories and tanneries. The parish church has a fine tower and spire, built in the 15th century. On a commanding site, overlooking the valley, are the ruins of a strong castle, built by William the Conqueror, who called here the great council of his barons to decide upon the conquest of England. The massive outer walls are still standing, but the hall has been demolished by its present owner. Near by is a tall round tower, with walls 13 ft. thick, isolated by a deep fosse, which is crossed by a drawbridge. It was built probably by the Harcourts, who owned the castle until the revolution. But Lillebonne is chiefly noted for its Roman remains. Beneath the castle and partly cut out of the hill is the theatre, the best preserved example of its class in northern Europe. It measures 300 ft. across the chord of the arc, and around the whole runs a vaulted passage 625 ft. long. The walls are faced with ashlar masonry of calcareous tufa, and banded together at irregular intervals with courses of red tiles. Among other remains are a Roman bath, a Gallo-Roman house, and many sepulchral monuments; and statues in marble and bronze, sculptures, mosaics, and numerous utensils of gold, bronze, iron, ivory, and glass, have been found here.—According to Ptolemy, Juliobona was the chief town of the Caleti or Caletes, an Armoric tribe occupying what is now the Pays de Caux, Caux being a corruption of Caleti. In the decline of the Roman empire it was ravaged by the barbarians, and it did not again acquire any prominence until the time of William the Conqueror.

**LILLERS**, a town of France, in the department of Pas-de-Calais, on the Nave, 24 m. N. N. W. of Arras; pop. in 1866, 5,414. It is situated in a verdant plain, watered by beautiful streams, and all its houses of any impor-

tance are ornamented with fountains. It has manufactories of linen, shoes, and earthenware, distilleries, tanneries, dye works, and oil mills. In the gardens of a former Dominican convent is the first artesian well, sunk in the 12th century; it is now nearly dry. In the church, which was founded in the 12th century, is a curious wooden sculpture, called the *Christ du Saint-Sang de Miracle*, of the same period.

**LILLO**, George, an English dramatist, born in London in 1693, died there in 1739. He had been brought up a jeweller, and even after attaining literary celebrity still pursued his business. His first play, "Silvia," appeared in 1731, and met with little success; but his tragedy of "George Barnwell," produced in the same year, was acted at Drury Lane for 20 consecutive nights, and so fascinated Queen Caroline that she requested to be permitted to peruse the manuscript of it. In 1737 "Fatal Curiosity," generally considered his best tragedy, was introduced at the Haymarket theatre, and was at first coldly received; but owing to the exertions of Henry Fielding it subsequently became more popular. The dramatic works of Lillo, with a memoir of his life, were published in London in 1755, in 2 vols. 8vo.

**LILLY**, or **Lyly**, John, an English author, born in Kent about 1553, died about 1600. He became a student in Magdalen college, Oxford, about 1570, received the degree of master in 1575, and was at that time a noted university wit. He soon after went to London, was reputed a rare wit and poet at the court of Elizabeth, and published his "Euphues, the Anatomy of Wit (1580), followed by "Euphues and his England" (1581), the elaborate, fanciful, and dainty style of which became the model of court conversation. (See **EUPHUISM**.) He enjoyed success also as a dramatic poet, producing eight plays, which, however, being designed for representation by children at court entertainments or private theatres, scarcely came into competition with the public drama. He was engaged in the Mar-Prelate controversy, and wrote "Pap with the Hatchet" (1589), a once famous pamphlet against the Martinists. A few modern critics, as Malone, Hazlitt, and Charles Lamb, have been enthusiastic admirers of his best pieces, as "Endymion" and the song on Cupid and Campaspe. His dramatic works, with a life and notes by F. W. Fairholt, were published in 1858 (2 vols., London).

**LILLY**, William, an English astrologer, born at Diseworth, Leicestershire, May 1, 1602, died at Walton-upon-Thames, June 9, 1681. In 1620 he went to London and secured a position as footboy to a merchant, who afterward employed him as an accountant. His master dying in 1627, Lilly married the widow, with whom he received £1,000. He began the study of astrology in 1632, and soon practised with eminent success, and instructed many persons in the art. In 1644 he produced the first number of his almanac, *Merlinus Anglicus Junior*, which contained remarkable prognostications,



was purchased with avidity, and was continued for many years. He was consulted both by the royalists and parliamentarians in the civil war. In 1651 he published "Monarchy or no Monarchy," containing several hieroglyphical figures, two of which were subsequently declared to have had reference to the plague and the great fire in London, and he was consequently summoned in 1666 before a committee of the house of commons. He afterward practised medicine in connection with his astrological science, till he was enfeebled by age. He published an autobiography (London, 1715), an "Introduction to Astrology" (new edition, with emendations and additions by Zadkiel, London, 1852), and other works.

**LILY**, a word of ancient and uncertain origin, and one which has, according to Prior, been long used in some oriental languages for a flower in general. In common use it is often applied in combination to plants which are not botanically lilies, either to those of the same family, as the day lily (*hemerocallis*), or to plants widely separated in their botanical relationships, as water lily (*nymphaea*). The lily proper (*lilium*) is the type of a large family of monocotyledonous plants, the *liliaceae*, as to the limits of which botanists are not agreed; some include the *melanthaceae*, *asparageae*, &c., while others keep these as distinct orders. The genus *lilium* includes plants with scaly bulbs, from which arise simple leafy stems, bearing at the top one to many large showy flowers; the stem leaves are alternate or whorled, short and sessile; some species bear small bulblets in the axils of the leaves, which when mature fall to the ground and take root. The flower consists of six petal-like divisions or sepals, which are distinct or partly united below, and spreading or recurved above, forming a funnel-shaped or bell-shaped perianth, each of the divisions having a honey-bearing furrow at the base; stamens six, the lower end of the long filaments slightly adhering to the base of the corolla; anthers linear, erect, at length versatile; pistil one, with a three-celled ovary, a long style, and a three-lobed stigma; fruit a three-celled dehiscent capsule, with two rows of flattened seeds, closely packed in each cell. Five native species of lily are found east of the Mississippi, and several are peculiar to the Pacific coast. The commonest of these is the wild yellow lily, *L. Canadense*, which is found in moist meadows from Canada to Georgia; the sepals are sessile, recurved above the middle, orange-colored, and spotted inside with dark brown. The orange-red lily, *L. Philadelphicum*, has darker-colored spotted flowers, grows in drier situations, and is readily distinguished from the preceding by having the sepals contracted below into a claw, and the flowers are more erect. The southern red lily, *L. Catesbaei*, has its sepals similarly narrowed below, and bears a solitary scarlet flower which is spotted within; this is found in pine barrens from Florida to Kentucky. The

most showy eastern species is the Turk's-cap lily, *L. superbum*, which is not rare in rich moist ground as far south as Georgia; the stem is from 3 to 8 ft. high, sometimes producing only 3 or 4 flowers, but often as many as 30 or 40, in a large pyramidal raceme; the sepals are strongly revolute on the margin, of a fine orange or orange-red color, with abundant purple spots; this magnificent plant is well worthy of cultivation, and though it is seldom seen in our gardens, large quantities of bulbs are sent abroad to supply those of Europe. In the southernmost states *L. superbum* is replaced by *L. Carolinianum*, which differs from it in its broader leaves, and fewer flowers more variegated with yellow; some botanists regard it as only a variety of *L. superbum*. The most noticeable lily of the far west is *L. Washingtonianum* of the sierras, which bears numerous pendulous flowers, at first pure white, but afterward tinged with lilac, and of the most exquisite odor; this species has been brought into cultivation, as have *L. Humboldtii*, with yellow, dark-spotted flowers, and *L. Bloomerianum*, a recently discovered species, with stems 10 ft. high, and orange purple-spotted flowers.—Among the many exotic species cultivated in gardens, the oldest and best known is the white lily, *L. candidum*, which was brought from the Levant some three centuries ago, as Gerarde in 1596 speaks of it as an old garden plant; this is the lily of poets and painters, and has long been regarded as the emblem of purity; in beauty, grace, and fragrance it is not excelled by more recent introductions. A variety has flowers marked with purplish red, and another has its leaves striped with yellow;



The Long-flowered Lily (*Lilium longiflorum*).

what is called the double white is a curious but inelegant monstrosity. The other white lilies of the garden are of more recent introduction. *L. longiflorum*, from Japan, is from 15 to 20 in. high, with one to three funnel-shaped flowers, 5 to 6 in. long and of exquisite

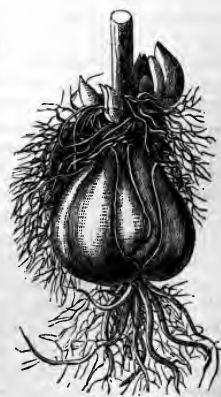
fragrance; this is barely hardy near New York, but is admirable for pot culture. *L. Japonicum* is similar in habit, but larger in all respects. *L. Brownii* is also similar to these, but grows 3 or 4 ft. high, and has the pure white of its large flowers streaked on the outside with purple. The rare giant lily, *L. giganteum*, from Nepal, has a stem nearly 10 ft. high, with 8 to 20 pendulous, fragrant flowers, which are white outside and tinged with violet within; the root leaves are broad and heart-shaped, and look unlike those of a lily. The Turk's-cap or Martagon lily, *L. Martagon*, a native of Europe, has long been in cultivation; the stem is 3 to 5 ft. high, with numerous small violet-purple flowers; this has produced several varieties, some nearly white; what is called the scarlet Martagon is *L. Chalcedonicum*, from Palestine, the vermilion-colored, unspotted flowers of which are exceedingly brilliant. The well known tiger lily, *L. tigrinum*, is from China; it has a cottony stem 4 to 5 ft. high, and numerous orange-red, black-spotted flowers; it produces bulblets in the axils of the leaves, by means of which the plant may be readily propagated; there is a double variety of this, more showy than elegant. Another garden species also bears bulbs, *L. bulbiferum*, from southern Europe; this is different from the other in having erect, orange, scarcely spotted flowers. The introduction of what are now called the Japan lilies about 30 years ago caused great excitement among florists; when they were first brought out they were cultivated as greenhouse plants, but they are perfectly hardy, and being now grown in this country by the acre, the price has been reduced from \$30 to \$40 a single bulb to half that price by the hundred; the species is now regarded as *L. speciosum*, but it appears in most catalogues as *L. lancifolium*; little is known about it in the wild state, but it was found cultivated in several varieties by the Japanese. The stem is from 1 to 3 ft. high, with lance-ovate leaves, and a few very large flowers, with reflexed wavy divisions, which are white, pale rose, or purplish; they have upon the inner surface numerous prominent warty projections, which are usually of a much darker color, and give the flower an elegantly fringed appearance. Numerous seedling varieties have been produced, differing in color and markings; the variety *monstrosum* produces what are apparently several stems blended into one flattened mass, the surfaces of which are closely studded with flowers. The golden-banded lily, *L. auratum*, is also from Japan, and of comparatively recent introduction; as usually seen, the stem is only about 2 ft. high with two or three flowers, but when well cultivated the plant has reached the height of 6 or 7 ft. with nearly 100 blooms; the flowers are 6 to 10 or 12 in. across, white, with a clear yellow stripe running the whole length of the sepals, which are spotted with purple, and have bristly projections at the base; the odor is peculiar, and so

powerful as to be oppressive to some persons. There is a variety with a crimson band instead of a yellow one, and another without any colored band. The first bulb of *L. auratum* sold



Golden-banded Lily (*Lilium auratum*).

in this country brought \$90; much finer bulbs can now be had for 50 cents or less. Considerable numbers of these bulbs are produced by our florists, but the principal supply comes from Japan, where the plant grows wild in abundance. Many other lilies besides those named are given in works on floriculture and in the catalogues.—Lilies are generally grown in our gardens without any special care. To have them in perfection, the soil should be prepared by working and manuring to the depth of 18 in.; the bulbs are usually set too shallow; the larger ones should not be less than 6 or 8 in. below the surface, and after the bulbs are once well planted they should rarely be disturbed; while tulips, hyacinths, and many other bulbs have their flowering qualities improved by an annual lifting and drying, this is not the case with the lily; for this reason imported bulbs, which have been out of the ground for some months, often require several years to become well established. Lilies are propagated in several ways.



Bulb of Lily.

Raising them from seed is slow, and is not often resorted to, save to obtain new varieties. A few species are increased by planting the bulbets borne upon the stem; in some



Lily Scale

the bulbs increase in number either by producing small ones at the base of the old bulb, or some inches distant, at the end of a rhizome. Layering the stem is sometimes practised, small bulbs being produced at the point of attachment of the leaf; this kind of layering takes place naturally when the bulb is planted sufficiently deep. (See LAYERING.) Still another method of propagation is by means of the bulb

scales, which are broken off from their attachment to the base of the bulb and placed in a pot or box of soil; this is done in autumn, and the earth containing the scales is kept all winter at a temperature of 50° or 60°; by spring each scale will have formed one or more minute bulbs at its base, when the boxes containing them are set out in the open ground; in two or three years the bulbs will be sufficiently large to flower.—The African lily, *agapanthus umbellatus*, from the Cape of Good Hope, is an old-fashioned house plant of the same family. It has long flat leaves and a stem 1 to 2 ft. high, bearing an umbel of large blue flowers; there is a form with handsomely striped leaves. It is not hardy, but is frequently turned out to bloom in the borders. Day lily is a name applied to plants of two genera of the lily family. One of the oldest inhabitants of the gardens is the tawny day lily, *hemerocallis fulva*; it has a tuberous root stock, and forms large clumps of long, linear, keeled leaves; the flower stems arise above the leaves and bear a few lily-shaped, yellowish copper-colored flowers, which remain open but for a day; in many places it has escaped from gardens and is naturalized along roadsides. *H. flava* is a more slender plant, with light yellow flowers, and there are several others cultivated. *Funkia*, a genus separated from *hemerocallis*, comprises plants with broad leaves with white or blue flowers, which are also called day lilies; *F. subcordata*, white, and *F. ovata*, blue, are the most common species. Lily of the Nile is one of the names for *Richardia Africana*, also called *calla Ethiopica*. (See CALLA.) Pond lily and water lily are common names for *nuphar* and *nymphaea*. (See WATER LILY.)

**LILY, William**, an English grammarian, born at Odiham, Hampshire, about 1466, died in London in February, 1523. He was educated at Oxford, spent five years at Rhodes studying Greek, and in 1509 established a classical school in London, and is said to have been the first Englishman that ever taught Greek in that country. When Dr. Colet founded St. Paul's school in 1510, he appointed Lily

its first master, and he held this office for 12 years. He died of the plague. The most important of his works is *Brevissima Institutio, seu Ratio Grammatices Cognoscenda* (4to, London, 1513), a book which, under the title of "Lily's Grammar," has probably passed through more editions than any other similar work. Dean Colet was the author of the English rudiments, Erasmus of the greater part of the Latin syntax, and Lily of the rest; and Cardinal Wolsey wrote the preface to the second edition.

**LILYBÆUM.** See MARSALA.

**LILY OF THE VALLEY** (*convallaria majalis*), one of the most popular of the many plants which have the name lily attached to them, but which do not belong to the genus *lilium*. The generic name is the Latin *lilium convallium* slightly altered, and of which our common name is a translation. Though introduced into our gardens from Europe, the plant is found perfectly wild upon the higher Alleghanies, from Virginia southward. It belongs to the asparagus suborder of the lily family, which includes the lily-like plants having no bulb, and producing a berry-like fruit. The lily of the valley is a perennial with slender running root stocks, which produce large scaly buds; each bud sends up in May two oblong, parallel-veined leaves, the petioles of which are so rolled together as to appear like a stalk, and a single slender stem which bears small bell-shaped, nodding, fragrant, white flowers in a one-sided raceme; the perianth, or what passes for corolla, has six recurved lobes, and at its base are six stamens; the berry is few-seeded, and red when ripe. There is a variety with yellow-striped leaves, one with pinkish and another with double flowers, neither of

Lily of the Valley (*Convallaria majalis*).

which is equal to the original in beauty. The plant can hardly be said to need cultivation; if planted in rich soil it takes possession, and the only care required is to prevent it from

encroaching upon other plants. The lily of the valley is a useful plant for forcing for winter flowers, and for a few years has been the most fashionable of all floral ornaments. Many thousands of crowns or "pips," as florists call them, are imported annually, consisting of two or three inches of root stock terminated by a bud; these are planted in boxes of rich earth, and kept cool for a few weeks until roots have formed; they are then brought into heat; light is not essential until the flowers are about to open. These flowers, consisting of a single raceme and leaf, bring a higher price in proportion to size than any other winter flower; but a large proportion of the imported crowns fail to bloom.

**LIMA**, the capital of Peru and of the department and province of its own name, on the

Rimac river, 7 m. from Callao, its port on the Pacific; lat. 12° 2' S., lon. 77° 7' W.; pop. in 1868, 121,362, of whom 38,761 were foreigners. The city, which is triangular, stands on a plain in a valley sloping gradually to the sea; it is 500 ft. above Callao, but so gentle is the slope that the road appears absolutely level. To the west and south no eminence intercepts the view or breaks the winds; but 60 m. to the east rises the Cordillera in regular stages, while spurs trending shoreward from the Andes sweep close by the town N. and E., and afford it a complete shelter. The city is 2 m. long and 1½ m. wide, and is divided by the Rio Rimac. The lower or southern and by far larger portion is surrounded by strong walls built in 1683. The streets average 34 ft. in width, cross at right angles, are for the most



Calles de la Coca and de Bodegones, Lima.

part paved with cobblestone, and nearly all have sidewalks 5 ft. wide of flags imported from Europe. Open gutters run down many of the streets parallel to the river. The city is well lighted with gas. The walled portion has 12 gates, the most beautiful of which are those of Callao and Maravillas; the other portion, encircled by mountains, has two entrances, La Guia and La Piedra Liza. The river is crossed by a stone bridge of six arches, built in 1610, 500 ft. long and 190 ft. high. The houses, owing to the infrequency of rain, are flat-roofed, and often unsubstantially covered; most of them have only two stories, as earthquakes are common. The entrance is usually through a large gateway leading to a courtyard, which is generally embellished with fountains, statues, flowers, shrubs, and rare trees. The wooden lattices on the balconies have of late years given place to glazed windows; and the

exterior of the houses is now painted in colors at once more gay and less fantastic than formerly, while stone has superseded adobe in their construction. The Plaza Mayor, the most spacious of the 33 public squares of Lima, embraces an area of nine acres in the centre of the city. Marble seats and vases are placed here and there; there is a fountain in each of the four corners, and one in the centre surrounded by a gorgeous garden. This fountain is of bronze, 40 ft. high, with a stone base ornamented with eight lions and as many griffins, and surmounted by a statue of Fame. The N. W. and S. W. sides are lined with stone columns and arcades dating from 1693, under the latter of which are brilliant shops, the chief dry-goods and fashion marts of the place, the upper part of the structures being occupied as dwellings. There are numerous beautiful public edifices, the most remarkable of which are

the cathedral, the archbishop's and the government palaces, and the town hall, all constructed by Francisco Pizarro, whose ashes repose beneath the grand altar of the first. The cathedral is of stone, 330 ft. long, and surmounted by two towers 133 ft. high. The interior is sumptuously ornamented, the decorations including a magnificent portrait of St. Veronica by Murillo. The edifice, which cost in the first place \$594,000, was greatly damaged by the earthquake of 1746, and was rebuilt by the viceroy Count Superunda. There are 56 other ecclesiastical edifices, of which 15 are public chapels, five are parish churches, and the remainder are attached to convents and monasteries. San Pedro, one of the most splendid churches, founded in 1598, is of immense size, has 17 altars, and is decorated in good taste; while some others have services and ornaments in gold, silver, and diamonds and other gems of incalculable value. The total number of persons engaged in religious services in Lima is 1,800. Many monasteries and convents have recently been suppressed. The government palace, once the property and residence of Pizarro, is large but unsightly; it contains the president's dwelling, with the several government offices, and the national printing office. The mint, which dates from 1565, is provided with modern machinery. The Lima university, founded in 1551, is the oldest in America; the present building was erected in 1576, but for some years past no lectures have been given in its halls, and the university no longer holds the exclusive privilege of conferring degrees. The eight national colleges are: the colleges of law, theology, medicine, and obstetrics, the school of arts and trades, the naval and military, intermediate, and normal schools. There are also about 70 public and private schools, and an orphan school. The first establishment founded by the independent government, in 1822, was the public library, now containing about 40,000 volumes. There are numerous charitable institutions, many being sustained by foreigners. The two military establishments are St. Catharine's barracks and the powder manufactory, the latter with machinery brought from Europe. The general cemetery, outside the gate of Maravillas, is one of the finest on the continent. Chief among the public promenades is the Paseo de los Descalzos, laid out in delightful avenues and alleys, with a road for carriages and equestrians. The centre is occupied by an enclosed garden with gorgeous flowers, and set off with 100 iron urns on pedestals 6 ft. high, and 12 colossal marble statues, symbolizing the signs of the zodiac, resting on plinths of beautiful stone. The Alameda Nueva or del Acho, with three parallel alleys, one of which is for equestrians, has a fine marble statue of Columbus unveiling an Indian woman. Few American cities have a larger number of handsome statues than Lima. That of Bolivar in the Plaza de la Constitucion is a magnificent bronze equestrian

statue, weighing 11 tons, mounted on a marble pedestal, with bassi-rilievi of the battles of Ayacucho and Junin. The principal places of amusement are the theatre, built in 1614; the circus of the Plaza de Acho, the largest arena for bull fights in the world, having accommodations for 9,000 spectators; and the Coliseo or cockpit. Bull fights are still in high favor in Lima, and the weekly performances are attended by vast crowds comprising all classes. Cock fights, despite frequent prohibitions, are still passionately persisted in; and, although those interested in the game are mostly of the lower orders, many amateurs from the better classes attend the fights each afternoon. The abattoir, outside the gate of Monserrate, a place for slaughtering sheep and cattle, was purchased by the government for \$320,000 in 1855, and the proceeds are paid into the national treasury. The only public market of importance occupies a portion of the Concepcion convent.—The manufactures are very limited. In the environs are several potteries in which common ware is made. About 1860 a factory was established for the manufacture of paper by machinery from the pulp of the yuca plant, which abounds in Peru. There are also manufactories of aerated waters and of tallow and sperm candles; and an indifferent kind of glue is made in small quantity. The high price of all kinds of labor renders the competition of native with foreign manufactures impossible; hence, although the various trades are represented by some skilful artisans, these find little encouragement save from the poorer classes. Photography has attained rare perfection here as elsewhere in the tropics, the chief elements of success being the pure sky and bright sun. Printing has also made considerable progress within a few years; there are now (1874) in Lima, besides the national printing office, several other establishments where work is executed in the best modern style, in three of which, with steam presses, are printed daily papers having a comparatively large circulation. Four lines of railway lead from Lima to Callao, to Chancay, to Chorrillos, and to Oroya, the distances being 7, 60, 8, and 130 m. respectively; three others, to Huacho, Piura, and Pisco, are to be completed in 1876; and each has telegraph wires open to public service. Lima is the chief centre of the Peruvian commerce, which is carried on through the port of Callao.—The original elements of the population were Indians, whites, and Africans, the intermixture of which has produced a great variety of hybrids. Since the importation of Africans ceased (1793), the number of negroes has greatly decreased, and the race is now represented by a few aged individuals of unmixed blood. Since the abolition of slavery in 1855 large numbers of Chinese have been imported, most of whom, after recovering their liberty, either keep gaming houses or eating houses, or become money lenders. The Indians are for the most part



muleteers and domestics; the mestizos and other half-breeds are public vendors and mechanics. The Spanish natives are courteous, affable, and generous, though for the most part improvident. The men are often well educated, but intellectual culture is little attended to among the women, whose chief acquirements beyond reading and writing are needlework, music, dancing, and painting. The *sayo* and *manto*, formerly so common, are now things of the past; the dress is mostly of black silk, and the only head cover is a long veil; but French fashions are now common, and among men universal.—Lima was founded on Jan. 6, 1535, by Francisco Pizarro, who, from the date (the festival of Epiphany, when the worship of Christ by the wise men or kings of the East is celebrated), named it Ciudad de los Reyes (City of Kings); but that name soon gave place to Lima, probably a Spanish corruption of Rimac. Pizarro was assassinated here on June 26, 1541. The city was elevated to a bishopric in the course of the same century, and five provincial councils were held there, the first of which was that of 1583. It has frequently been visited by earthquakes, the most disastrous being those of 1582, 1586, 1630, 1678, 1697, 1746, 1828, and 1868; that of 1746 proved fatal to the port. (See CAL-LAO.) On July 12, 1821, it was entered by the Chilian army under San Martin, who on the 28th was proclaimed protector of independent Peru; and on July 29, 1838, the inhabitants revolted against Gen. Santa Cruz. The yellow fever committed frightful ravages in Lima in 1854, the only disastrous epidemic recorded in its annals.

**LIMBO** (Lat. *limbus*, border or edge), according to some of the scholastic theologians, one of the places into which departed spirits are received. St. Thomas Aquinas places hell in the centre of the earth; it is encircled first by purgatory, above which extend successively the *limbus infantum* and the *limbus patrum*. The former includes children dying before baptism, who according to different dogmatists pass thence to heaven or remain for damnation. The latter, which is also called the bosom of Abraham (*sinus Abrahæ*), includes the holy men of the old covenant, the patriarchs, and other pious ancients who died before the birth of Christ. According to the usual account, Christ opened this limbo when he went down into hell, liberated the souls detained there, and admitted them to the privileges of the blessed; and it has remained from that time closed and unoccupied. Dante describes the limbo in which he met with the distinguished spirits of pagan antiquity as the outermost circle of hell.

**LIMBORCH**, **Philippus van**, a Dutch theologian, nephew of Episcopius, born in Amsterdam, June 19, 1633, died there, April 30, 1712. In 1657 he became pastor of the congregation of Remonstrants at Gouda, and from 1668 till his death was professor of theology in the Remonstrant college at Amsterdam. As an Armini-

an theologian he ranks next to Arminius and Episcopius, and was distinguished equally for learning and for liberality. Locke, who was his correspondent, dedicated to him his *Epistola de Tolerantia*. Limborch's principal work is his *Theologia Christiana* (4to, Amsterdam, 1686; English translation with additions, by William Jones, 2 vols. 8vo, London, 1702), which was the first and most complete exposition of Arminian doctrine, and was undertaken at the request of the Remonstrants. He also wrote, besides many minor works, *De Veritate Religionis Christianæ* (4to, Gouda, 1687); *Historia Inquisitionis* (fol., Amsterdam, 1692; English translation by Samuel Chandler, 2 vols. 4to, London, 1731); and a commentary on the Acts and the Epistles to the Romans and Hebrews (fol., Rotterdam, 1711).

**LIMBURG. I.** A territory of Europe, formerly constituting a province of the Netherlands. Before its division in 1830 it extended between lat. 50° 42' and 51° 45' N., and lon. 4° 57' and 6° 15' E., and was bounded by the provinces of North Brabant, Gelderland, Rhenish Prussia, Liège, South Brabant, and Antwerp. It was a county at an early date. Among its rulers at the close of the 11th century was Count Henry, son-in-law of Frederick of Luxemburg, duke of Lower Lorraine. His son Henry inherited large estates in Luxemburg, was made duke of Lower Lorraine by the emperor Henry IV., and seems to have been the first titular duke of Limburg. He died in 1119. At the close of the 13th century one of his descendants ceded the province to Duke John I. of Brabant, and the battle of Woeringen (1288) confirmed the latter in his possession. Early in the 16th century it was a duchy, and included several districts now belonging to the province of Liège. The city of Maestricht was added to the duchy in 1530. By the treaty of Westphalia in 1648 Limburg was divided between Austria and the states general, the latter receiving the counties of Daelhem and Falkenberg. Under the French, Limburg with other territory constituted the departments of Ourthe and Basse-Meuse. After the Belgian revolution of 1830 Limburg was divided between Holland and Belgium, but the boundaries were not definitely settled till 1839. **II.** The Dutch province, bounded by North Brabant, Gelderland, Rhenish Prussia, and Belgian Limburg, being partly separated from the latter by the Maas or Meuse; area, 851 sq. m.; pop. in 1872, 225,702, chiefly Roman Catholics. It is generally level, and the northwest portion contains many heaths and marshes. The most fertile soil is found in the valleys of the Maas, Roer, and other rivers; elsewhere the land is generally poor. Cereals, hemp, and flax are raised. Gin is the staple manufacture, and among the others are tobacco, soap, leather, paper, and glass. The principal towns are Maestricht, the capital, Venloo, Roermond, and Weert. From 1839 to 1866 Dutch Limburg belonged in a military sense to the German confederation, as a com-

pensation for that part of Luxemburg which had been ceded by Holland to Belgium. **III.** The Belgian province, bounded N. E. and E. by the preceding, S. by Liége, W. by Brabant and Antwerp, and N. by North Brabant; area, 931 sq. m.; pop. in 1870, 200,336. The surface is flat, underlaid with fossiliferous limestone. The portion bordering on the Maas affords good pasturage, and the south and central parts contain much arable land, but the other portions are mainly barren heath. Cattle and swine are raised; iron, lead, calamine, and other minerals are mined; and brandy, beet sugar, and straw hats are manufactured. The principal towns are Hasselt, the capital, St. Trond, Tongern, and Maaseyck. **IV.** A town of Belgium, once the capital of the territory of Limburg, now in the province and 16 m. E. of the city of Liége; pop. about 3,000. It was once populous and strongly fortified, but is now almost a ruin, its most important part being Dolhain, a suburb of the old city. It is on the Vesdre river, and is finely situated on an eminence. The church of St. George, damaged by fire in 1833, but since restored, contains a Gothic tabernacle and a monument to a princess of Baden. Cloth is manufactured, and zinc and coal mines are worked in the vicinity. The celebrated Limburg cheese is mostly made in the neighboring town of Herve. **LIMBURG-ON-THE-LAHN**, a town of Prussia, in the province of Hesse-Nassau, 16 m. N. E.



Cathedral of St. George.

of Ems; pop. in 1867, 4,487. It is a very old town, celebrated for the picturesque situation of the superb cathedral of St. George, with seven towers, which exhibits the latest Byzan-

tine architecture in its mixture with the earliest pointed Gothic. It is one of the finest churches in Germany, and was built in the 13th century on the site of one founded in the beginning of the 10th. The town contains a Roman Catholic seminary and other schools, and has manufactories of cloth, machines, and pottery, and a large marble quarry. It was of considerable importance in the middle ages, and possesses a valuable source of the early German history in the so-called "Limburg Chronicle," said to have been commenced in 1336; it was continued down to 1612, and edited by Faust of Aschaffenburg (Worms, 1617), and by Vogel (Marburg, 1826; new ed., 1828). Limburg was next to Wiesbaden one of the principal towns of the former duchy of Nassau.

**LIME**, oxide of calcium, or quicklime, a white, alkaline, earthy substance, obtained by calcining some of the various carbonates of lime, such as pure limestones, marbles, and marine shells. It is brittle and pulverizable, and has a specific gravity, depending on its porosity, from 2.3 to 3.8. Its symbol is CaO, containing 40 parts of the metal calcium and 16 of oxygen, by weight. It has not been decomposed by heat, and is only fused in the oxyhydrogen blow-pipe and the voltaic arch. When subjected to this heat it gives out a most intense light (Drummond light). When lime is made from pure limestone or from pure dolomite (see DOLOMITE), it is called rich; when it contains impurities so as to diminish its value as an ingredient of mortar, it is called poor; when it contains silica and alumina in certain proportions which cause it to set quickly in the presence of water, it is called hydraulic lime. (For the preparation of mortar, see CEMENTS, and CONCRETE.) The calcining or burning of lime is performed in kilns, of which there is a great variety, classified into periodic and continuous kilns. Periodic kilns are those in which the limestone and fuel are mingled (most of the fuel being placed beneath), and after the operation is completed removed, which requires of course an intermission to clear out the kiln before repeating the process. These kilns are usually bowl-shaped, and are erected upon a slope of ground which admits of easy access to the top of the kiln. The sides are walled up with sandstone or granite, and an opening is left at one side of the bottom. In charging the kiln a quantity of wood, sometimes mingled with anthracite coal, is placed in the bottom, then a quantity of limestone broken into fragments is thrown in; then a layer of wood, and over this again a quantity of broken limestone, the alternation being repeated until the kiln is filled. It is then covered with turf or sod, and a flame kindled below. The continuous kiln is constructed in such a manner that the lime may be drawn off at one side without extinguishing the fire. These are to be preferred when fuel is expensive, because great loss of heat is involved in letting the fires go out.

There are several kinds of these kilns, for a description of which the reader is referred to the more strictly technological works.—Perhaps the most remarkable property of freshly burned lime is its affinity for water, with which it unites with great violence and evolution of heat, 100 parts of lime by weight requiring only 32 parts of water to produce a temperature of 300° F. This combination (slaking) forms a hydrate of the definite composition  $\text{CaH}_2\text{O}_2$ , or  $\text{CaO}, \text{H}_2\text{O}$ . This hydrate is a white soft powder, which gives off water at a red heat, being converted again into quicklime. It is slightly soluble in water, forming what is called lime water, or *aqua calcis*. It is more soluble in cold than in hot water; so that when a saturated solution is boiled some of the lime will be deposited. A much greater quantity than is soluble may be suspended in water in the form of milk of lime; when the mixture is of a creamy consistency it is called cream of lime. According to Dalton, lime water saturated at 60°, 130°, and 212° F. contains one grain of lime to 778, 972, and 1,270 grains of water respectively. A solution evaporated *in vacuo* over oil of vitriol deposits hydrate of lime in hexagonal prisms. Lime water has the property of precipitating most of the metallic oxides from solutions of their salts, and of forming soapy mixtures with oils. When lime water is exposed to the air, it absorbs carbonic acid and soon becomes covered with a pellicle of carbonate, into which after a time all the lime is converted.—*Salts*. The salts of lime are numerous; the most important are the following. Hydrate of lime when exposed to the action of chlorine gas forms a mixture of chloride and hypochlorite of calcium. (See BLEACHING POWDER.) 1. Chloride of calcium, formerly called muriate of lime, is found in sea water and in some saline springs, often accompanied by traces of bromine and iodine. It is commonly made artificially by dissolving carbonate of lime in hydrochloric acid ( $\text{CaCO}_3$  or  $\text{CaO}, \text{CO}_2 + 2\text{HCl} = \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$ ). The solution is evaporated to dryness and heated to redness to expel moisture. It must be preserved in air-tight bottles, because its attraction for water is so great that it soon becomes moist in the open air. It is on account of this property that it is so extensively used by chemists as a filter through which to pass gases to deprive them of aqueous vapor. It is also used to separate alcohol, ether, and other liquids from a mixture by distilling them off. One part of water at 66° F. will dissolve four parts of dry chloride of calcium, but at 32° not more than two parts; while at 212° it will dissolve an almost unlimited quantity. It is copiously soluble in alcohol, and in the cold crystals are formed containing about 60 per cent. of alcohol instead of water of crystallization. 2. For fluoride of calcium see FLUOR SPAR. 3. Sulphide of calcium ( $\text{CaS}$ ) is formed by passing sulphuretted hydrogen ( $\text{H}_2\text{S}$ ) over red-hot lime

( $\text{CaO} + \text{H}_2\text{S} = \text{CaS} + \text{H}_2\text{O}$ ). It is also formed by the action of charcoal or hydrogen on sulphate of lime (gypsum) at a red heat. When freshly prepared it is phosphorescent (Canton's phosphorus). 4. Bisulphide of calcium ( $\text{CaS}_2$ ) is produced by boiling sulphur and hydrate of lime in equal parts in water; the solution yields on cooling reddish yellow four- or six-sided prisms, which are permanent when dried *in vacuo*. Their water of crystallization is 33.89 per cent., so that their formula is  $\text{CaS}_2 + 3\text{H}_2\text{O}$ . 5. Pentasulphide of calcium ( $\text{CaS}_5$ ) is a non-crystallizable salt, formed by boiling an excess of sulphur with quicklime and water; it is soluble in alcohol. By the action of heat it loses sulphur and becomes protosulphide. 6. For sulphate of lime ( $\text{CaSO}_4$ ) see GYPSUM. 7. Sulphite of lime ( $\text{CaSO}_3$ ) is formed by passing sulphurous acid through milk of lime. It is a white powder of sulphurous taste, and requires about 800 parts of water at 60° for solution. It is made soluble by excess of sulphurous acid, and then separates in hexagonal prisms, which dissolve with difficulty, and are converted into sulphate of lime on exposure to the air. 8. Hyposulphite of lime ( $\text{CaOS}_2\text{O}_2$ ) is formed by triturating in a mortar crystals of hydrated bisulphide of calcium; also by passing sulphurous acid through the yellow liquor obtained by boiling lime and sulphur in water, filtering, and evaporating the solution at a temperature not above 140° F. Hexagonal crystals are obtained having the composition  $\text{CaOS}_2\text{O}_2 + 6\text{H}_2\text{O}$ , which are decomposed at the boiling point into sulphate of lime and sulphur. This salt is employed in photography to remove silver salts. 9. Phosphuret of calcium ( $\text{Ca}_2\text{P}_2$ ) is a brown compound formed by passing the vapor of phosphorus over lime heated to redness. This compound is a mixture of phosphuret of calcium and phosphate of lime; it decomposes water with the evolution of phosphuretted hydrogen. When lime is heated to redness its oxygen converts a part of the phosphorus into phosphoric acid, and the liberated calcium combines with another portion of phosphorus to form phosphuret of calcium. 10. Hypophosphite of calcium ( $\text{CaP}_2\text{O}_3 + 2\text{H}_2\text{O}$ ) is obtained by carefully boiling phosphorus in thin cream of lime, filtering the solution, and passing carbonic acid through it to separate excess of lime. It is also formed by boiling phosphuret of calcium in water, and treating the solution in the same way. When evaporated *in vacuo*, the solution furnishes rectangular prismatic crystals of the hypophosphite, insoluble in alcohol, but equally soluble in hot and cold water. 11. Phosphates of lime are definite compounds of lime with phosphoric acid, of which there are several, but the two following are the most important. Common phosphate, tribasic phosphate, or bone earth ( $\text{Ca}_3\text{P}_2\text{O}_8$ ), is a salt found in the mineral kingdom and in bone ash. On adding chloride of calcium to the tribasic phosphate of soda,

a corresponding phosphate of lime precipitates. Hydrochloric and nitric acids, and also acetic acid and water saturated with carbonic acid, readily dissolve bone phosphate. Caustic ammonia added to these solutions reprecipitates the original phosphate. Native phosphate of lime occurs in apatite. Crystallized apatite is found in Cornwall and Devonshire, England, and in Spain and Bohemia. It is one of the most beautiful of phosphorescent minerals, and when placed upon iron heated just below redness it emits a pale green light. There is generally a small amount of fluoride of calcium present. Bodies known as coprolites, the excrements of fossil reptiles, contain large quantities of phosphate of lime; they are found throughout the lias formation in England, and in all strata which contain the remains of carnivorous reptiles. These bodies resemble oblong pebbles, and have a size corresponding to the cells of the intestines in which they were contained. (See COPROLITES.) Phosphate of lime exists in small quantities in all fertile soils, and also in the vegetables which they produce, and through them it finds its way into the bodies of the animals that feed upon them, a fact having an important bearing upon agriculture. Superphosphate or acid phosphate of lime ( $H_4Ca_2PO_4$ ) is formed by digesting phosphate of lime in phosphoric, muriatic, or nitric acid. It is deliquescent, soluble in water, with an acid reaction, and does not crystallize on evaporating the solution. When biphosphate of lime is distilled with charcoal, it yields phosphorus and basic phosphate, the excess of acid being reduced. Superphosphate of lime is an ingredient of several artificial manures, and is valued as being more immediate in its action than bone ash, and required in smaller quantities. The economy of its use is however questionable. Lime, or the metal calcium, also unites with bromine and iodine, bromic, iodic, chloric, and perchloric acids, forming bromide and iodide, bromate, iodate, chlorate, and perchlorate of calcium. 12. Nitrate of calcium, or nitrate of lime ( $Ca_2NO_3$ ), is conveniently formed when carbonate of lime is dissolved in nitric acid. It is found in old mortars, and sometimes occurs in spring and river waters. It is soluble in alcohol. It fuses on exposure to heat, and on cooling forms a phosphorescent substance called Baldwin's phosphorus. When heated, the nitric acid is driven off and pure oxide of calcium remains. 13. Carbonate of lime ( $CaCO_3$  or  $CaO,CO_2$ ), as has been observed, exists in a native state in limestones and marine shells. It may be formed artificially by passing carbonic acid gas through lime water, or otherwise exposing hydrate of lime to the action of carbonic acid; or by double decomposition of soluble lime salts and carbonates of other metals, as for instance between chloride of calcium and carbonate of potassium,  $CaCl_2 + K_2CO_3 = CaCO_3 + 2KCl$ . When a stream of carbonic acid is passed into a solution of lime water, an insoluble carbonate is at first precipi-

tated, but on continuing the operation the carbonate becomes dissolved, a supercarbonate being formed, which is more soluble. It also appears that a dicarbonate exists, from the fact that in burning lime one half of the carbonic acid is more easily driven off than the other half. 14. Silicates of lime are found in nature in several forms; apophyllite is a hydrated potassio-silicate; datolyte and botryolite are hydrated boro-silicates of lime. Silicate of lime also enters into the composition of a large number of native silicates, such as hornblende and augite, and forms an important part of mortars and hydraulic cements. (See CEMENTS, and CONCRETE.)—Lime is of great importance in agriculture, and is used in several forms, both separately and in combination with various other substances in artificial and farmyard manures. Its use in bone earth has been mentioned. It is a constituent of some of the salts in all the excrements of animals; the ash of nearly all plants contains it in some form, and it is furnished to the soil in the products of their decomposition. One of the principal agricultural uses of lime, however, is not alone to supply the growing plants with their needed constituents, but so to act upon the soil as to unlock its riches to them. For this purpose it is applied usually in the form of freshly slaked hydrate, which, acting upon the mineral matter, causes decomposition, and moreover favors the decomposition of vegetable matter. Soils which are rich in feldspathic minerals, or those containing silicates of potash and soda, are particularly benefited, after they have been worn, by the application of caustic lime, which acts by combining with the silica, forming a silicate of lime and liberating the alkali, which is now free to enter into the composition of the growing plants. As a rule those soils are the richest (supposing them to contain sufficient organic matter) which are abundantly supplied with alkaline salts. The principles of the agricultural uses of lime are well set forth in Johnston's "Agricultural Chemistry," and also in Liebig's letters and works on chemistry. Other uses of lime and its salts are various. The hydrate is largely used in coating the plastered walls of buildings; by the tanner in removing hair from hides; and by the paper maker, in conjunction with alkaline carbonates, in the preparation of pulp. It acts not only directly upon the vegetable fibre, but also abstracts carbonic acid from the alkali, rendering it caustic. On account of this action it is also used in the manufacture of caustic potash and soda. The hydrate is also largely consumed in the purification of illuminating gas. (See GAS.)—*Tests for Lime and its Salts.* Lime water is distinguished from a solution of baryta by not being thrown down by dilute sulphuric and fluosilicic acids. Unlike baryta or strontia, lime is deposited from a saturated solution by boiling. The soluble salts of lime are precipitated by alkaline carbonates and bicarbonates, and also by oxalic acid and oxalate

of ammonia. The latter salt will detect one part of lime in 50,000 of water. Chloride of calcium imparts an orange red color to alcohol flame, which by spectrum analysis is resolved into green and orange bands.—*Medical Uses of Lime.* Several salts of lime are used in medicine. The hydrate, when mixed with an equal weight of caustic potassa, constitutes the *potassa cum calce* of the United States Pharmacopœia, or Vienna caustic. Lime water is often used as an antacid, especially for children. It prevents the too rapid coagulation of the milk used in their food, and has besides a restraining effect upon diarrhœa, so that it is sometimes called astringent. Combination with sugar renders lime more soluble in water, and a saccharine solution or sirup may be used, which contains a much larger quantity of lime than lime water. Lime water with milk is often used in diseases of the stomach; a combination which is sometimes borne, especially in the nausea of pregnancy, when no other food can be retained. As lime water has some power in dissolving the false membrane of croup, it has been employed in that disease, both by projection of its spray into the fauces, and by the inhalation of the vapor arising from slaking lime. The various carbonates of lime, such as prepared chalk, precipitated carbonate, prepared oyster shells, crabs' claws, and "crabs' eyes," are used to neutralize acid in the stomach both in indigestion and in poisoning by acids. They are specially called for in oxalic acid poisoning. Chloride of calcium has been used as a tonic, but is less employed than formerly. Phosphate of lime or bone earth has been considerably used in medicine, to increase the supply of this salt for the formation of bone and the promotion of the general nutrition. (See HYPOPHOSPHITES.)—The following works on the uses of lime, besides those already mentioned, may be consulted: Hassenfratz, *Traité théorique et pratique de l'art de calciner la pierre calcaire et de fabriquer toutes sortes de matières, ciments, bétons, &c.* (Paris, 1825); Vicat, "Treatise on Calcareous Mortars and Cements," translated from the French by J. T. Smith (London, 1837); Dumas, *Chimie appliquée aux arts*, vols. liv., lv., chap. viii.; Regnault, *Cours de chimie*, vol. ii. (1849); Burnell, "Treatise on Limes, Cements, Mortars, Concretes," &c. (in Weale's "Rudimentary Series," 1850); Gen. Q. A. Gillmore, "Lime, Hydraulic Cements, and Mortars" (New York, 1872); and Beckwith, "Report on the Hydraulic Lime of Theil" (New York, 1873).

**LIME**, a fruit resembling a miniature lemon, produced by a species or variety of *citrus*. As mentioned under **LEMON**, there is great difficulty in defining the species of *citrus*, and some botanists incline to regard nearly all the cultivated ones as forms of *C. medica*. The books generally refer the lime to *C. limetta*, but that produces a very different fruit from the one known in our commerce as the lime; some authors refer our fruit to *C. lima*, others

to *C. acida*, while Grisebach ("Flora of the British West Indies") regards it as a dwarf, spiny, and small-fruited variety (var. *spinosis-sima*) of the common orange, *C. aurantium*; it is considered as indigenous to the West Indies, and is there used as a beautiful and serviceable hedge plant. The fruit varies much in size, sometimes being only an inch long; the skin is thin, greenish yellow, and the abundant juice very sour, with a slight bitterness; the juice is used for the same purposes as lemon juice. Large quantities of lime juice are exported from the West Indies for the manufacture of citric acid, and for use as an anti-scurbutic upon long sea voyages. For the botanical characters of the genus, see **ORANGE**.

**LIMERICK.** I. A S. W. county of Ireland, in the province of Munster, bordering on Clare, from which it is separated by the Shannon, Tipperary, Cork, and Kerry; area, 1,035 sq. m.; pop. in 1871, 191,313. The surface is mountainous in the northeast, south, and southwest, and elsewhere level or undulating. The most important rivers are the Shannon, Maigue, and Deel. Iron, copper, and lead ores are found. The soil is very fertile, especially along the banks of the Shannon and in the "Golden Vale," a tract which extends from Tipperary W. through the centre of the county. An excellent breed of long-horned cattle is reared here, and cattle raising and dairy farming are the principal branches of industry. Wheat, oats, rye, potatoes, and turnips are extensively grown. The manufactures consist of coarse woollens, lace, paper, flour, and meal; and large quantities of the products of the county are exported. The chief towns are Limerick, Rathkeale, and Newcastlle. This county is the most interesting in Ireland to the archæologist, on account of its numerous Cyclopean remains, military earthworks, ancient castles, and ruins of religious houses. II. A city, capital of the county, and a county in itself, on the estuary of the Shannon, 106 m. W. S. W. of Dublin, with which and with Cork and Waterford it is connected by railway; pop. in 1871, 49,670. It consists of the "English town," built on an island in the Shannon, and the "Irish town" and "Newton Pery," on the left bank of the river. These three portions are connected by five bridges, one of which, the Wellesley bridge, cost £85,000. The Thomond bridge, rebuilt in 1839, is interesting from historical associations. Its approach was anciently guarded by a fort and by King John's castle. The great gateway and round towers of the latter are still in good preservation, but the picturesqueness of the castle is marred by the modern roofs and by the buildings of the barracks, into which the interior has been converted. Newton Pery is filled with handsome modern houses, and is much the most attractive part of the city. The houses on the island are principally in the Flemish style. The old (or Irish) town is a mass of dilapidation and filth, the old crumbling houses being used by the poor wherever

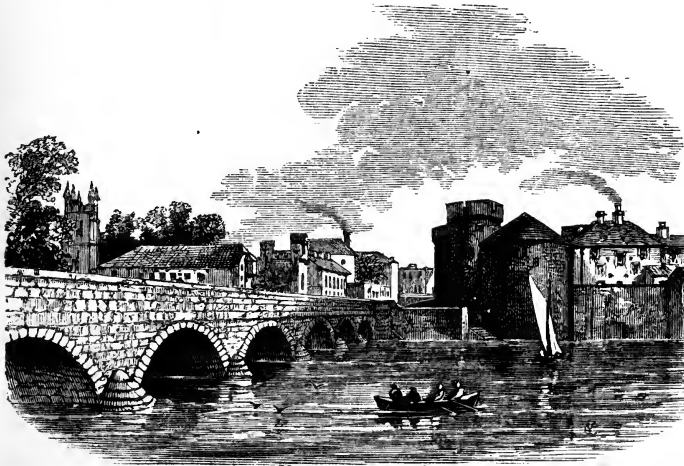


they can find something like a roof to cover them. The chief public edifices are the law courts, prisons, custom house, chamber of commerce, exchange, linen hall, corn and butter markets, assembly rooms, barracks, and hospitals. There are 20 places of worship, of which 6, including a cathedral with remarkably fine bells, belong to the Episcopal church of Ireland, and 9, including a cathedral completed in 1860, to the Roman Catholics; a district lunatic asylum, Mount St. Vincent orphanage, and a model school. The streets in the new quarters are spacious and regular, and the appearance of the town is very bustling and animated. The manufactures include flax spinning and weaving, and lace making; corn mills, iron foundries, and a military clothing establishment; besides distilleries, breweries, tanneries, and slips for ship building. Limerick has an active foreign trade, being the chief port on the W. coast for the shipment of raw

which submitted to William III. in 1691. A treaty was signed here on the latter occasion guaranteeing to Roman Catholics certain religious rights, and promising an amnesty to all who took the oath of allegiance. It is the headquarters of the S. W. military district.

**LIMESTONE**, the generic name of all rocks which are principally composed of carbonate of calcium. It is more particularly applied to those which are not crystalline, and are not white like marble. Perfectly crystallized carbonate of lime is calc spar or Iceland spar. When it is imperfectly crystallized and has a fine grain, whether pure white or veined, it is called marble. Limestones of all kinds are found in rocks of all geologic ages, but the more crystalline varieties occur with the more distinctly metamorphic rocks. Magnesian or dolomitic limestone is noticed in the articles **CEMENTS, DOLOMITE, LIME, and MARBLE**. There are limestones which are not magnesian, but

whose fossils contain this substance; thus an *orthoceras* in the Trenton limestone of Ottawa, Canada, which is not magnesian, contained, according to T. Sterry Hunt, carbonate of lime 56·00, carbonate of magnesia 37·80, carbonate of iron 5·95=99·75. Whenever limestones are not metamorphic, they bear traces of organic structure, and it is generally believed that all limestones have been formed from shells and corals which have been triturated by the waves and afterward compacted together. They usually contain more or



Thomond Bridge and King John's Castle, Limerick.

produce. By the Grand canal and by railway it has ready communication with the most important towns of Ireland, while its harbor is sufficiently capacious to receive a large amount of shipping, extending nearly a mile along the river, and has a breadth of 150 yards, with from 2 to 9 ft. of water at low tide and 19 ft. at spring tide. The line of quays extends about 1,600 yards, and there are also floating docks. The new graving dock, where vessels of 1,500 tons can be repaired, has been finished at a cost of £20,000. In 1872 there entered at the port 441 British vessels, tonnage 77,476, and 89 foreign vessels, tonnage 37,350; cleared, 206 British vessels, tonnage 35,600, and 42 foreign vessels, tonnage 17,906. The registered shipping of the port comprised 31 sailing vessels, tonnage 1,806, and 2 steamers, tonnage 385.—Limerick surrendered to the parliamentarians under Ireton in 1651, after a gallant defence; and it was the last place in Ireland

less impurities in the form of clay, sand, talc, or other mineral substances which have been incorporated with them during the process of trituration. Hydraulic limestone is described in **CEMENTS**, and oölitic and other limestones are treated under their appropriate heads.

**LIMESTONE. I. A N.** county of Alabama, bordering on Tennessee, bounded S. by the Tennessee river, and watered by Elk river and its branches and several creeks; area, 575 sq. m.; pop. in 1870, 15,017, of whom 7,253 were colored. The surface is hilly, and the soil very productive. The rock is limestone, from which the county derives its name. The Memphis and Charleston and the Nashville and Decatur railroads pass through it. The chief productions in 1870 were 24,010 bushels of wheat, 404,435 of Indian corn, 17,922 of Irish and 15,427 of sweet potatoes, 115,982 lbs. of butter, and 7,319 bales of cotton. There were 2,213 horses, 1,479 mules and asses, 2,188 milch cows,

3,339 other cattle, 3,960 sheep, and 13,566 swine; 1 flour mill, and 3 saw mills. Capital, Athens. II. An E. central county of Texas, watered by the Navasoto and several other small streams; area, 900 sq. m.; pop. in 1870, 8,591, of whom 1,919 were colored. The surface is undulating; about two thirds of the soil is a fertile sandy loam, the rest being black sticky prairie. The Houston and Texas Central railroad passes through it. The chief productions in 1870 were 190,609 bushels of Indian corn, 13,741 of sweet potatoes, 10,608 lbs. of wool, and 3,414 bales of cotton. There were 6,000 horses, 620 mules and asses, 844 milch cows, 38,472 other cattle, 3,681 sheep, and 13,370 swine. Capital, Springfield.

**LIME TREE**, or **Basswood**. See **LINDEN**.

**LIMITATION**, **Statutes of**, laws which provide that certain debts or claims shall not be prosecuted after a certain time. The origin of these statutes, which are now found in every civilized community, was undoubtedly the probability that an old debt had been paid, and the hardship of holding a payer to pay his debt twice over because, in the lapse of time, he had lost the evidence of his payment. \* When therefore such a stale debt was brought before a court, the law presumed that it had been paid, without proof. Such a presumption still exists in cases not provided for by the statutes; it being a general rule of the common law of England and America, that there is a presumption of payment of all personal claims, after 20 years have passed without any evidence of acknowledgment by the debtor. But in the year 1624 (21 James I.) it was enacted by the parliament of England that all actions of account, and all actions upon the case other than such accounts as concern the trade of merchandise between merchant and merchant, all actions of debt on any lending or simple contract, and all actions of debt for rent due, should be commenced and sued within six years next after the cause of such actions should accrue. This statute was the foundation of all the statutes of limitation which have been since then enacted in England and in the United States; nor have they varied greatly from it. Divested of technical language, it may be said that no action can be maintained for any debt more than six years old, founded upon a simple contract; by which is meant any contract not created by a sealed instrument or resting on a judgment of court. The exception of actions founded on mutual accounts of trade between merchants is common; and in many states all mutual accounts are excepted, while in some others there is an exception in favor of a witnessed note of hand, these accounts and notes being barred only by the 20 years' presumption. For a time the courts favored these laws, and construed them liberally against the debt or action. Then, however, the views and practice of courts changed, and they seemed to regard the statutes of limitation as proper objects of dislike, and construed them very

liberally in favor of the debt or action. That is, they permitted the defence of the statute to be overthrown by slight and even frivolous evidence of any acknowledgment on the part of the debtor within six years; and although they could not say that this made the original debt any younger, and so took it out of the operation of the statute, they did say that the acknowledgment was a new promise, and maintained the action on this ground. But in recent times wiser views began to prevail. Judge Story said (5 Mason, 523): "I consider the statute of limitation as a highly beneficial statute, and entitled as such to receive, if not a liberal, at least a reasonable construction, in furtherance of its manifest object." These views now decidedly prevail both in England and America. The question, by what rule the statute shall be construed, is in fact the question whether it shall be regarded as a statute of presumption or a statute of repose. If the former, then an action founded upon an old debt is to be barred only because it is probable that an old debt has been paid; and therefore all confessions or acknowledgments, all acts and all words, in any way throwing a doubt on this payment, may be considered as overthrowing the presumption of payment, and maintaining the action. But if it is to be regarded as a statute of repose, then it is founded on the principle that an old debt, whether it have been paid or not, should not now be brought out to disturb relations between the parties which had become settled by time; for a creditor who has been negligent enough to let his debt lie by so long, neither prosecuted nor verified, should lose it, because the peace of society requires that claims which have long slumbered should be considered as dead. Where this view was adopted, it is plain that no mere acknowledgment of an old debt would prevail against the statute; but if the debtor saw fit to make, within the six years, a distinct new promise to pay the debt, there was no reason why he might not make it, and none why, if he made it, he should not be held to perform it. So also, if the debtor saw fit to make, within the six years, a part payment of the debt, not in full, but as an acknowledgment of the whole debt, it might fairly be regarded as a promise to pay the remainder, and as reviving the balance of the debt. These views at length prevailed so decidedly in England, that in 1828 (9 George IV.) what is there called Lord Tenterden's act was passed; which appeared to be so reasonable, and was found in its operation so useful, that it has been widely adopted in the United States. This statute provides, in substance, that no debt which is barred by the statute of limitation shall be revived by any new promise or acknowledgment, unless that be in writing; but this statute still permits a part payment to revive the debt.—As the law now stands, it may be said that the new promise which revives a debt must not be in words

of doubtful meaning, but an actual promise; some of our courts however, it must be admitted, apply the rule, even now, with much laxity. So if there be an acknowledgment, written where that is required, or spoken elsewhere, it must be a distinct acknowledgment that the debt now exists and is due. It need not acknowledge or promise any precise amount, for evidence may prove this; but it must be sufficiently precise and definite to show that this very debt was in contemplation when the promise or acknowledgment was made. Hence, it is now clear that an acknowledgment which negatives a promise, as "I owe that debt, but do not choose to pay it," does not revive the debt; and it is but an extension of this rule to say that an acknowledgment so guarded and defined or limited that it cannot be fairly regarded as intended to be a new promise, will not revive the debt. So if the promise or acknowledgment be conditional, as, "when I am able," or "if I recover such a debt," it revives the debt only if the condition be performed.—If part payment is relied upon as reviving the debt, it must be shown, by direct or circumstantial evidence, that the payment was made as a part of a larger debt, and of the debt in controversy; for in the absence of all such evidence it will be presumed that the payment was made as of the whole that was due. If a debtor owes his creditor several debts, some of which are outlawed (which is a common phrase for barred by time) and some are not, and pays him a sum of money without indicating what debt it shall be applied to, the creditor may apply the payment to the outlawed debts, but cannot, by such part payment, revive the remainder. But if a debt consist of principal and interest, a payment on account of either will take the whole debt from the statute. Tenterden's act, which requires the new promise to be in writing, is now held, in England and in the United States, not to require the evidence of a part payment to be in writing. As a part payment operates as a new promise, it is clear that no part payment can revive a debt unless it be made not only on account of the debt, but by some one who had authority from the debtor to make it as a part payment, or to bind him by his promise. If the original promise were made by two jointly, it cannot be revived by either so as to bind the other, unless he has (as a partner has if the firm be in existence when the promise is made) a right to promise for himself and the other also. Formerly, the acknowledgment by one revived it as to all, because it removed the presumption of payment. But now that the statute is regarded as one of repose, the rule is as above stated.—It is important to determine when the six years begin to run. The general answer is, from the day when the creditor could have commenced an action for the debt. Thus, if the original promise be on time, or a sale be on credit, or any debt contracted on definite credit, the six years do not begin when

the debt begins, but when it is payable; that is, when the time or the credit expires. So if a surety pays for his principal, he may make his principal repay him; and his action is not barred when six years elapse from the maturity of the debt which the surety paid, but from the time of his payment. If an action cannot be brought until after a demand, it is not barred (or outlawed) until six years after the demand is made. But a note on demand may be sued at once, and is always payable; and the six years begin to run against it from its date. The six years begin to run as soon as the action accrues, although the damage or injurious consequences occur later; as if one is injured by the fault of another (a railroad company for example), the action must be brought within six years from the time when the injury occurs, although its consequences, for which the action is in fact brought, were developed at a much later period. If money be payable by instalments, the statute begins to run as to each instalment from the day on which it becomes due; but if there be an agreement that when one is unpaid all shall become due, the statute begins at once to run as to all.—The statutes of limitation always contain exceptions to meet cases of disability. In general, they are substantially the same as the exceptions in the original statute of James, which provides that if the plaintiff, when the cause of action accrues, be within the age of 21 years, a married woman, of unsound mind, in prison, or beyond the seas, he or she may bring his action at any time within six years after the disability is removed; or, as it is commonly expressed, the statute does not begin to run until the disability is removed. In applying this rule, it is held that if the disability does not exist when the cause of action accrues, or if it exist then and is afterward removed, although but for a short time, so that the statute once begins to run, the statute is not suspended or arrested by a subsequent disability. If several disabilities exist when the cause of action accrues, the statute does not begin to run until all are removed; but if there be one at that time, and afterward but before that one be removed there be other disabilities, the statute begins to run as soon as the first is removed, and is not affected by the subsequent ones. Thus, if one was 20 years old when a debt to him accrued, and before he was 21 went abroad and remained ten years, he could not bring his action on his return, because the statutory six years began as soon as his minority expired. So too, by a later English statute (4 Anne, ch. 16, s. 19), generally enacted here, it is provided that if the defendant be out of reach, as beyond the seas, when the action accrues, the six years do not begin against the plaintiff until the defendant returns; and in this country this is held to intend an open and public return, such as would afford opportunity to bring suit. In the United States, instead of the English phrase

"beyond the seas," other phrases are used, the most common of which is "out of the state," and all are held to mean that. It is sometimes provided that if, after the action accrues, the defendant shall be absent from and reside out of the state, the time of his absence shall not be taken as any part of the time limited for the commencement of the action. Where there is this provision, it has been questioned whether the aggregate of successive and distinct absences can be deducted from the time, or only one single absence. This is determined differently; in some states but one single absence is deducted, while in others all the absences are.—The statute affects only the remedy for the debt, or the right to recover it by action, but does not affect the validity of the debt. Hence it does not affect any security given for the debt. Thus, if there be a mortgage of land or of goods to secure a note or bond, this mortgage remains in full force, although the six years have expired so that no action can be maintained on the note or bond.—Because the law of limitation is a law of remedy and not of right, it affects the method of recovering a debt, but not the debt itself; and therefore, in general, the law of the forum (*lex fori*), or the law of the place where the action is brought, determines the limitation, and not the law of the place where the debt is contracted. Thus, if A lives in Massachusetts, and there owes to B a certain debt which will be barred in six years, and they both go to Rhode Island, where we will suppose the debt to be barred in three years, and after three years B sues A in Rhode Island, the law of Rhode Island bars the action, although the law of Massachusetts would not. And we think the converse proposition equally true, that if the limitation be shorter in the state where the debt was contracted, and longer in that to which the parties have come, it is this last law which prevails. In Massachusetts (11 Pickering, 36) it was held that if both parties remain abroad until the debt is wholly barred where it was contracted, and then both come into that state, the creditor may sue the debtor in Massachusetts until six years have expired after their coming into that state. The principle seems to be, that wherever the statute of limitation is relied upon in defence, it is the statute of the jurisdiction where suit is brought that must be pleaded in bar, and the defendant must show that his case comes within it. But where a right of action is barred by lapse of time in any state, it cannot be revived in that state by a repeal of the statute.—The cases of actions founded on any specialties, as deeds, bonds, or judgments, and any action to recover land, have usually a limitation of 20 years, and in some cases 10 years. Besides these there are, in the several states, and in the United States, various provisions as to other actions, in which there is little uniformity, and of which we could make no useful statement without occupying many pages with the details. Thus, a limited time is given within which actions

may be brought against sheriffs, or marshals, or executors or administrators, or for slanderous words, or for personal assaults or trespasses. For some of these actions, and in some of the states, this limitation is very short; a year, and even less in some cases. By the application of the ancient law maxim, *Nullum tempus occurrit regi*, or in other legal words, no laches (or neglect) is imputable to the king or government, it is held that rights of action possessed by the state may be enforced by action at any time, so far as the general statutes of limitation might affect them. But in many of the states there are statutes which bar the right of the state after a certain period; and it is very common to limit prosecutions for crime to some short period, excepting, however, the case of murder and perhaps some others.—The word "limitation" is also used in law with reference to instruments transferring real estate. It means that an estate cannot continue after a certain contingency occurs; the limitation of an estate is therefore the definition or restriction which confines an estate not to a time certain, but to a time which may be rendered certain by the happening of an event; as if an estate be given to hold until from the net proceeds a certain sum shall be made, or until the grantee marries. The distinction between a limitation in a deed and a condition is technical, and sometimes difficult. In general, if an estate is given to be held by the grantee until a specified event shall occur, this is but a limitation; but if it be given only with a proviso, or a condition (that is, with the words "provided that," or on "condition that"), to the effect that the estate or interest of the grantee shall cease and determine when the event shall occur, this is not a limitation, but a condition.

**LIMITED LIABILITY**, a peculiar responsibility for contracts, defined by statute. The instance of partnership is a common one in which parties by the relation itself assume a general liability for the acts and defaults of their associates when acting within the scope of the business; and this is irrespective of the several interests of the partners, and cannot be limited by the understanding between them. Nevertheless there is no reason in public policy why one partner should not be vested with exclusive authority to act for all, nor why others dealing with the partnership should not be permitted to stipulate to confine their negotiations to that partner. Indeed, public policy might often be subserved by that course, for men of large means might be willing to unite with others in important enterprises if their liability could be restricted to the consequences of contracts framed in every instance by themselves, when they would be unwilling to put their fortunes at stake upon the judgment, discretion, or integrity of others. Accordingly, it has been customary in very recent times to provide by statutes for the formation of partnerships with a limited liability on the part of

some of the partners. In order, however, that no injustice may be done to others in such cases, these statutes provide for the giving of public notice of the limited nature of the proposed responsibility, and establish other precautions to prevent the arrangement becoming a cloak for fraud. These limited partnerships have everywhere the same general features. There are general partners and special partners. They enter into a formal contract of partnership in writing. In giving public notice of the arrangement the names of all are given, and the amount of the capital put in by the special partner is named, and this capital, and this alone, is put at risk by him in the business. But this capital must be actually paid in, and any misstatement in this particular will make the special partner liable for all debts. The notice is required to be published in some form, and generally, also, to be recorded in some public office; and the general partner assumes the management of the business, which must not be interfered with by the other. The contract specifies the term for which the partnership is to continue, and any failure to comply with the statute in any substantial particular (as, for instance, in publishing the usual notice in a newspaper, where that is required) would be held to leave the case without the statute, so that only a common law partnership would exist, with full liability on the part of all members.—Analogous to these are the cases of joint-stock companies. Where these companies are formed without reference to statutory provisions, they may perhaps confine the authority to act for them to their officers; but as such companies are partnerships, troublesome questions of fact would be apt to arise, whether in any case a party contracting with a private member who assumed to act for the company was fairly and fully notified that he had no authority so to do. Accordingly many statutes have been passed, particularly in Great Britain and in the Netherlands, for the regulation and control of joint-stock companies with limited liability. The provisions for this purpose are very minute and particular, but the leading idea is that they must apprise the public of the particular nature of their association, so that no one need be deceived. The companies assume a joint name, after which, when used in their public notices and elsewhere, is added the word "limited," and their books are required to be open for public inspection. Observing the statutory precaution, the members are only liable for company debts to the extent of the amount invested therein, or to the extent specified in their articles.—The case of corporations with limited liability of members is quite different. In a partnership all members are presumptively liable for all the joint debts, but in case of a corporation all members are presumptively exempt from liability except to the extent of their investment. Where, therefore, members are liable further in conse-

quence of statutes, the statutes have been passed for the purpose of extending individual liability, instead of restricting it as in case of partnerships and joint-stock companies. The policy of making stockholders liable further, in some cases, was recognized in this country early in the present century, and it has been acted upon in a constantly increasing number of cases ever since. In some cases stockholders in banks have been made liable generally for all the bills of the bank. In other cases all stockholders are made liable for all of a certain class of debts; as, for instance, debts for personal labor performed for the corporation. In other cases they are made liable for all debts, though perhaps only to a certain extent; as, for instance, to the extent of twice the amount of stock held by them. There are constitutional provisions in several of the states on the subject, that of California making each stockholder liable for his proportion of all debts; but a more common provision makes him liable for the stock held and an equal sum in addition. Generally the corporation must be proceeded against first, and the resort to the stockholder is only after failure to collect from corporate property. Laws or constitutional provisions establishing this liability do not affect corporations previously chartered, except where a power of control had been reserved to the legislature in chartering them. This extension of liability of stockholders has not been adopted to any considerable extent abroad.—The method of limiting the liability of common carriers has been referred to under that title. The responsibility of the husband for the debts and obligations of the wife is also considered under the title HUSBAND AND WIFE. So far as the wife's debts at the time of the marriage are concerned, no contract or settlement between the parties can protect the husband against liability; though if she has an estate of her own, the proper contract may give him a remedy against it. But statutes, as was said under that title, have removed this liability altogether in some states. As to engagements by the wife after marriage which are to charge the husband, he may preclude them by giving notice in advance that he will not be bound by them; but to be sufficient in the case of one who has dealt with the wife before, as agent for the husband and with her assent or ratification, the notice must be brought home to him personally. And even such a notice would not be sufficient to protect the husband from liability for actual necessities supplied to the wife where she was living and cohabiting with him, or living elsewhere with his consent and without means of her own, and was not provided for by him.—Corporations, especially those of a public nature, are often limited by their charters in the amount of the debts they may incur; but when these are contracted in negotiable form, and are negotiated, they have been held to be enforceable though the limit was exceeded;



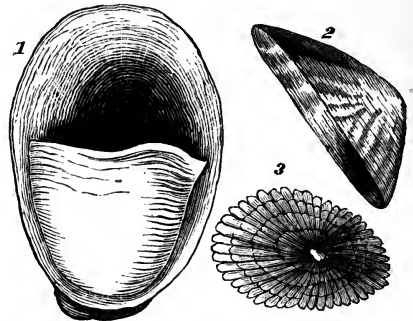
the rule of the law merchant for the protection of bona fide holders, overriding the rule of statute law for the protection of the corporation.—For the limitation of suits to enforce liabilities, see LIMITATION, STATUTES OF.

**LIMOGES**, a town of France, capital of the department of Haute-Vienne, situated on the right bank of the Vienne, which is here crossed by three bridges, 215 m. S. by W. of Paris; pop. in 1872, 55,134. It is built on the top and side of a hill, and except in its older parts has regular streets, with two handsome squares and many fine edifices. The principal public buildings are the cathedral, a Gothic structure begun in the 13th century, the churches of St. Michel and St. Pierre, the bishop's palace, the public library, which contains 23,000 volumes, the town hall, the theatre, and the beautiful fountain of Aigoulène. The town also contains a theological seminary, a college, an insane asylum, and several institutions of charity. The most flourishing manufacture is that of porcelain, due to the discovery here in 1768 of kaolin. The art of enamelling, for which Limoges was distinguished from the 14th to the 18th century, has since declined. The commerce is active in grain, wine, brandy, iron, copper, tin, and kaolin. The Limousin horses are a celebrated breed, much valued for the cavalry service.—Limoges was the chief town of the Celtic tribe of the Lemovices. It was a place of importance under the Romans, was ceded to the English by the treaty of Breigny, and formed part of the principality of Aquitaine under Edward the Black Prince, who in 1370 put 3,000 of its inhabitants to the sword in consequence of a revolt against his authority. A conflagration in 1864 destroyed

60 saints, and possessed more than 40 convents before the revolution.

**LIMOUSIN**, a former province of central France, now forming parts of the departments of Haute-Vienne, Corrèze, Creuse, and Dordogne. It was bounded N. by Marche, E. by Auvergne, and S. and W. by Guienne and Angoumois. Its capital was Limoges. The inhabitants are engaged more in stock raising and manufactures than in agriculture.

**LIMPET**, a name applied to the gasteropod mollusks of the families *patellida*, *calyptraei-*

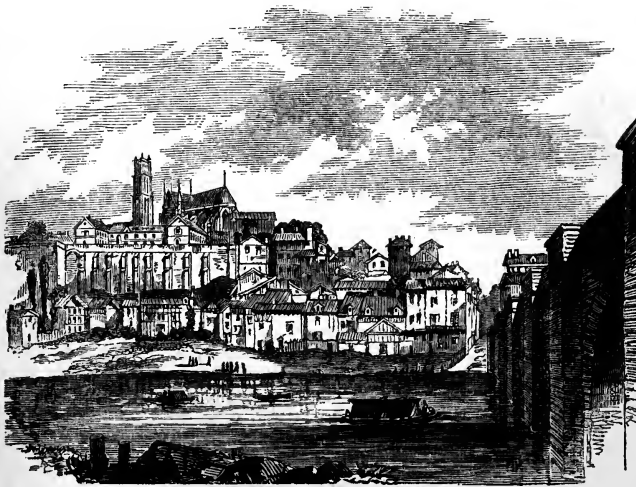


1. Boat Shell (*Crepidula*). 2. Rock Limpet (*Patella*).  
3. Keyhole Limpet (*Fissurella*).

*da*, and *fissurellida*. The shell is conical, with the apex turned forward, variously ridged, and with more or less indented borders; the species are all marine, very numerous both living and fossil, and largest in the tropical seas. The common or rock limpet (*patella*) is more or less circular, conical above, flat below, furnished

with a large, thick foot, by which it adheres very firmly to rocks and other shells; the food consists of seaweeds, which it rasps with the powerful tongue. In the second family, or bonnet limpet, belongs the "boat shell" or "ladies' slipper" (*crepidula*) of the New England coast, having a wide horizontal partition over half the shell, like the seat of a boat; they adhere very firmly to the rocks. In the third family, the keyhole limpet (*fissurella*) has the apex pierced by a small longitudinal fissure, resembling a keyhole.

**LINACRE**, Thomas, an English physician, born in Canterbury about 1460, died in London, Oct. 20, 1524. He was a fellow of Oxford, studied on the continent, became professor of physic at Oxford, was physician and tutor to the prince of Wales, and physician to Henry



Limoges.

100 houses. Limoges is one of the oldest strongholds of Roman Catholicism in France, having supplied the church with 4 popes and

studied on the continent, became professor of physic at Oxford, was physician and tutor to the prince of Wales, and physician to Henry

VIII. and to the princess Mary. Through his influence the college of physicians in London was founded, and he was its president during life. This organization of the medical faculty first gave educated physicians rank above quacks and pretenders. He also studied divinity, and received various preferments. He was one of the first, in conjunction with Colet, Lily, Grocyn, and Latimer, to introduce classical learning into England. His most celebrated works are his Latin translations from Galen, which, in the opinion of Erasmus, "speak better Latin than they ever spoke Greek."

**LINCOLN**, the name of 16 counties in the United States. **I.** A S. county of Maine, bounded S. by the Atlantic and W. in part by the Kennebec, and drained by Sheepscott, Damariscotta, and Musconegus rivers; area, about 700 sq. m.; pop. in 1870, 25,597. The soil is productive, but the inhabitants are mainly engaged in navigation and fisheries. It has many fine harbors. The Knox and Lincoln railroad passes through it. The chief productions in 1870 were 4,702 bushels of wheat, 28,255 of Indian corn, 21,766 of oats, 48,175 of barley, 241,625 of potatoes, 11,485 of peas and beans, 48,820 lbs. of wool, 537,885 of butter, and 44,185 tons of hay. There were 2,260 horses, 6,136 milch cows, 3,656 working oxen, 6,469 other cattle, 13,936 sheep, and 1,437 swine; 32 manufactories of brick, 47 of cooperage, 2 of machinery, 2 of matches, 9 of fish oil, 5 of sails, 6 of tin, copper, and sheet-iron ware, 3 wool-carding and cloth-dressing establishments, 4 establishments for curing and packing fish, 4 flour mills, 19 saw mills, and 15 ship building and repairing establishments. Capital, Wiscasset. **II.** A W. county of West Virginia, intersected by the Guyandotte river; area, about 350 sq. m.; pop. in 1870, 5,053, of whom 36 were colored. The surface is hilly and well wooded; the soil is productive. Iron and coal are abundant. The chief productions in 1870 were 6,260 bushels of wheat, 104,961 of Indian corn, 12,054 of oats, 7,151 lbs. of wool, 56,083 of tobacco, and 48,271 of butter. There were 547 horses, 950 milch cows, 1,607 other cattle, 3,874 sheep, and 4,051 swine. Capital, Hamlin. **III.** A S. W. county of North Carolina, intersected by the South Catawba and bounded E. by the Great Catawba; area, 275 sq. m.; pop. in 1870, 9,573, of whom 2,759 were colored. The surface is undulating, and the soil fertile. Gold is found in the eastern portion, and iron is abundant. The western division of the Wilmington, Charlotte, and Rutherford railroad passes through it. The chief productions in 1870 were 42,155 bushels of wheat, 190,286 of Indian corn, 52,396 of oats, 12,572 of sweet potatoes, 44,674 lbs. of butter, and 242 bales of cotton. There were 1,022 horses, 681 mules and asses, 1,739 milch cows, 2,183 other cattle, 4,971 sheep, and 7,567 swine; 1 manufactory of cotton goods, and 3 of pig iron. Capital, Lincolnton. **IV.** A N. E. county of Georgia, bounded N. E. by

the Savannah river, which separates it from South Carolina; area, 220 sq. m.; pop. in 1870, 5,413, of whom 3,616 were colored. The surface is hilly and the soil moderately fertile. The chief productions in 1870 were 75,606 bushels of Indian corn, 21,275 of oats, 7,918 of sweet potatoes, and 2,587 bales of cotton. There were 462 horses, 508 mules and asses, 1,054 milch cows, 1,852 other cattle, 1,360 sheep, and 3,317 swine; 11 flour mills, and 6 saw mills. Capital, Lincolnton. **V.** A S. W. county of Mississippi, watered by affluents of Pearl river and by the Bogue Chitto and Homochitto rivers; area, about 600 sq. m.; pop. in 1870, 10,184, of whom 4,162 were colored. The surface is uneven and largely occupied by pine forests; the soil is moderately fertile. The New Orleans and Jackson railroad passes through it. The chief productions in 1870 were 144,364 bushels of Indian corn, 25,052 of sweet potatoes, 3,850 bales of cotton, and 23,406 lbs. of rice. There were 1,121 horses, 2,084 milch cows, 1,018 working oxen, 3,056 other cattle, 4,144 sheep, and 8,882 swine. Capital, Brookhaven. **VI.** A N. W. parish of Louisiana, formed in 1873 from portions of Bienville, Claiborne, Jackson, and Union parishes; area, 550 sq. m. It is watered by Bayou d'Arbonne and other streams. The surface is undulating and the soil mostly fertile. Capital, Vienna. **VII.** A S. E. county of Arkansas, formed since the census of 1870, bounded N. E. by the Arkansas river, and S. W. by the Saline, and intersected by Bayou Bartholomew; area, about 700 sq. m. The surface is level and partly covered by forests of cypress, ash, &c.; the soil is fertile. Capital, Star City. **VIII.** A S. county of Tennessee, bordering on Alabama; area, 650 sq. m.; pop. in 1870, 28,050, of whom 5,953 were colored. The Elk river intersects it from E. to W. The surface is undulating and the soil fertile. It is well watered, the streams affording valuable water power. The Winchester and Alabama railroad terminates at the county seat. The chief productions in 1870 were 202,497 bushels of wheat, 1,233,960 of Indian corn, 72,179 of oats, 29,982 of Irish and 23,103 of sweet potatoes, 31,837 lbs. of tobacco, 48,113 of wool, 318,173 of butter, and 3,745 bales of cotton. There were 7,968 horses, 3,434 mules and asses, 6,934 milch cows, 1,371 working oxen, 8,099 other cattle, 27,075 sheep, and 26,595 swine; 1 manufactory of cotton yarn, 7 of saddlery and harness, 1 of woollen goods, 13 tanneries, 13 currying establishments, 9 saw mills, and 8 flour mills. Capital, Fayetteville. **IX.** An E. central county of Kentucky, drained by Dick's river and its branches, and by the sources of Green river; area, 280 sq. m.; pop. in 1870, 10,947, of whom 3,076 were colored. The surface is undulating and the soil fertile. The Knoxville and Richmond branches of the Louisville and Nashville railroad pass through it. The chief productions in 1870 were 61,306 bushels of wheat, 16,148 of rye, 321,438 of Indian corn, 72,611

of oats, 13,499 of potatoes, 17,840 lbs. of wool, 160,860 of butter, and 2,596 tons of hay. There were 2,678 horses, 1,706 mules and asses, 2,153 milch cows, 7,165 other cattle, 7,422 sheep, and 13,157 swine; 4 manufactories of saddlery and harness, 1 of woollen goods, 3 distilleries, and 9 saw mills. Capital, Stanford. **X.** A S. central county of Minnesota; area, 432 sq. m.; pop. not reported in the census of 1870. It is watered by Hassan river and Buffalo creek. **XI.** An E. county of Missouri, separated from Illinois by the Mississippi river; area, 576 sq. m.; pop. in 1870, 15,960, of whom 1,987 were colored. It is drained by the Cuivre or Copper river and its branches, and by the Eagle fork and Big creek. The surface is undulating and the soil fertile. The chief productions in 1870 were 144,364 bushels of Indian corn, 25,052 of sweet potatoes, 3,850 bales of cotton, and 23,406 lbs. of rice. There were 1,121 horses, 2,084 milch cows, 1,018 working oxen, 3,056 other cattle, 4,144 sheep, and 8,882 swine; 4 flour mills, 3 saw mills, 1 leather-carrying establishment, 2 tobacco factories, and 4 wool-carding and cloth-dressing establishments. Capital, Troy. **XII.** A central county of Kansas, intersected by Saline river and Covert creek; area, 720 sq. m.; pop. in 1870, 516. The chief productions in 1870 were 1,785 bushels of wheat, 9,536 of Indian corn, and 319 tons of hay; value of live stock, \$33,436. Capital, Rocky Hill. **XIII.** A W. county of Nebraska, intersected by the Platte river; area, 2,592 sq. m.; pop. in 1870, 17. It is traversed by the Union Pacific railroad. Capital, North Platte. **XIV.** The S. E. county of Nevada, bounded E. by Utah and Arizona, from which it is in part separated by the Colorado river, and S. W. by California; area, 14,000 sq. m.; pop. in 1870, 2,985, of whom 11 were Chinese. It is generally barren and waterless, but there is some agricultural land in Meadow valley in the N. E., and in the valley of the Virgin, which empties into the Colorado. The principal agricultural region is the Pahrana-gat valley, in the N. W., 20 m. long and 6 m. wide. There are mines of silver at Pioche in the N. E., at Potosi in the S. W., in El Dorado cañon, and in the Pahrana-gat district. The chief productions in 1870 were 2,995 bushels of wheat, 6,080 of Indian corn, 4,200 of barley, 4,690 lbs. of wool, and 1,169 tons of hay. There were 581 horses, 500 milch cows, 1,125 other cattle, 1,674 sheep, and 120 swine; 1 brewery, and 2 quartz mills. Capital, Pioche. **XV.** A S. E. county of New Mexico, bordering on Texas, and intersected by the Rio Pecos; area, about 13,000 sq. m.; pop. in 1870, 1,803. The W. part is mountainous; the E. portion is occupied by the Llano Estacado or Staked Plain. The chief productions in 1870 were 13,607 bushels of wheat, 134,162 of Indian corn, and 2,843 of barley. Capital, Placita. **XVI.** A S. E. county of Dakota, separated from Iowa on the E. by the Big Sioux river; area, about 600 sq. m.; pop. in 1870, 712. The chief pro-

ductions in 1870 were 4,830 bushels of wheat, 3,318 of Indian corn, 1,386 of oats, 295 of barley, 3,301 of potatoes, and 17,340 lbs. of butter. There were 112 horses and 864 cattle. Capital, Canton.

**LINCOLN**, a S. county of Ontario, Canada, bounded N. by Lake Ontario, and E. by the Niagara river; area, 321 sq. m.; pop. in 1871, 29,547, of whom 9,005 were of English, 7,928 of Irish, 7,396 of German, and 3,611 of Scotch origin or descent. It is traversed by the Welland canal, the Erie and Niagara, the Great Western, and the Welland railways. Capital, St. Catharines.

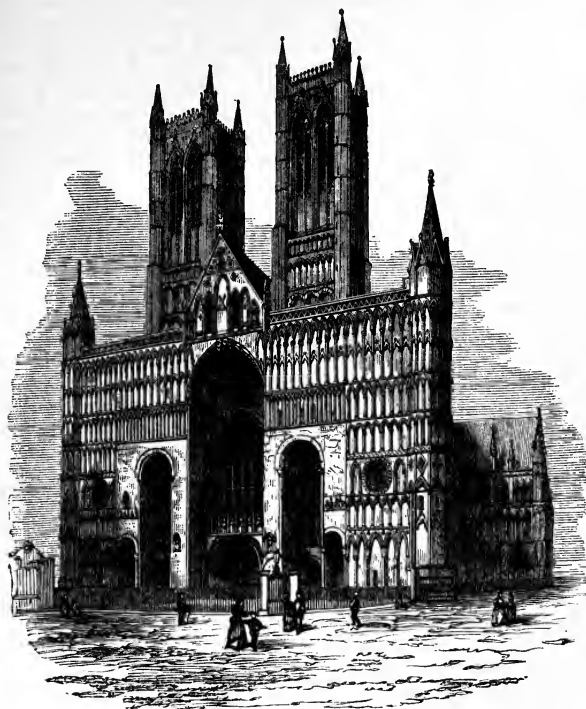
**LINCOLN**, a city and the capital of Nebraska, county seat of Lancaster co., on the right bank of Salt creek, a tributary of the river Platte, and at the intersection of the Burlington and Missouri River, the Midland Pacific, and the Atchison and Nebraska railroads, 50 m. S. W. of Omaha, and 475 m. W. by S. of Chicago; lat. 40° 55' N., lon. 96° 52' W.; pop. in 1870, 2,441; in 1874, about 6,500. It is built on a beautiful and gently sloping prairie. The streets are lighted with gas. The state house is a handsome edifice of white limestone, erected at a cost of \$100,000. The state university, with a brick building costing \$150,000, and the state agricultural college are situated here. The United States post office and court-house building, for which an appropriation of \$130,000 has been made by congress, is now (1874) in course of erection. Just beyond the city limits are the state penitentiary and insane asylum. A mile and a half W. is a salt basin, where good salt is manufactured. Lincoln has a board of trade, three wholesale houses (one dry goods and two groceries), a foundry, a marble shop, a spring-bed factory, a pork-packing establishment, two bookbinderies and blank-book manufactories, three job printing offices, and five banks. There are four public school buildings, one of which cost \$55,000, with a system of graded schools, including a high school; four hotels, a public reading room, an opera house, an academy of music, two daily and three weekly newspapers, a semi-monthly periodical, and nine churches, viz.: Baptist, Congregational, Disciples', Episcopal, Lutheran, Methodist Episcopal, Methodist Protestant, Presbyterian, and Universalist. Lincoln was laid out in July, 1867.

**LINCOLN**, a city and parliamentary and municipal borough of England, capital of Lincolnshire, and a county in itself, on the Witham, 120 m. N. by W. of London; pop. in 1871, 26,762. It is a very ancient town, irregularly built on the side of a hill, but is paved, lighted with gas, and well supplied with water. It contains 13 churches, the principal of which is the cathedral, one of the finest in the kingdom. This stands on an eminence, and is 524 ft. long and 250 ft. wide; it has three towers, the centre one 53 ft. square and 300 ft. high, the others 180 ft. high. The famous bell called Great Tom of Lincoln hung in one of these towers,

but in 1834 it was broken up and recast. Within a few years the cathedral has undergone extensive repairs and alterations. Other conspicuous buildings are the post office, the

tions. He worked with his father in clearing up the new farm, being unusually large and strong for his age. Here he received about one year of schooling, which was all that he

ever had. But he became expert at figures, and the few books within his reach were diligently read. Among them were "Æsop's Fables," "Robinson Crusoe," "Pilgrim's Progress," a history of the United States, Weems's "Life of Washington," and the "Revised Statutes of Indiana." He kept a scrap book, into which he copied the striking passages of whatever he read. In 1825 he was employed at \$6 a month to manage a ferry across the Ohio at the mouth of Anderson's creek. He was famous for telling stories and making stump speeches on the farms where he worked at various times, and wrote doggerel satires on the ludicrous characters with whom he came in contact. He was noted also for his immense strength and agility, and his skill as a wrestler. He was six feet four inches high. In 1828 he went to New Orleans as "bow hand" on a flatboat with a cargo of produce. In March, 1830, the family moved to Illinois, settling 10 m. west of Decatur, where they built a log house on the north fork of the Sangamon, and cleared 15 acres of



Lincoln Cathedral.

corn exchange, and the county hospital. There is a school of art, a mechanics' institute and museum, a public library, and numerous schools and benevolent institutions. The principal industry is the manufacture of agricultural implements; there are also large breweries, tanneries, iron foundries, grist mills, boat yards, and ropewalks. In the vicinity are numerous nurseries, lime kilns, and brick yards.

**LINCOLN, Abraham**, sixteenth president of the United States, born in Hardin (now Laree) co., Ky., Feb. 12, 1809, died in Washington, D. C., April 15, 1865. His ancestors were among the early settlers of Rockingham co., Va., whither they had come from Bucks co., Pa., and whence his grandparents removed to Kentucky about 1781. His father, Thomas Lincoln, born in Virginia, married Nancy Hanks, also a Virginian, in 1806. In 1816 they removed to what is now Spencer co., Ind., settling in the forest near the present village of Gentryville. Here, in October, 1818, Mrs. Lincoln died, and a year and a half later Mr. Lincoln married a widow Johnston, an old neighbor in Kentucky. With this stepmother Abraham always maintained the kindest rela-

tion, for the fencing of which Abraham split the rails. After becoming of age he spent a year or two in working at odd jobs for the farmers of the neighborhood, and about this time he made his first public speech; it was on the navigation of the Sangamon river, and was delivered extemporaneously in reply to one by a candidate for the legislature named Posey. In 1831, with his half brother and brother-in-law, he built a flatboat and navigated it to New Orleans, with a merchant's cargo, their wages being 50 cents a day and \$60 to be divided among them for the round trip. Just below New Salem, on the Sangamon, the boat stuck on a dam and was in danger of going to pieces, but was saved by the ingenuity of Lincoln, who invented a novel apparatus for getting it over and saving the cargo. This seems to have turned his mind to the subject of overcoming such difficulties of navigation, and in 1849 he obtained a patent for "an improved method of lifting vessels over shoals." The design is a bellows attached to each side of the hull, below the water line, to be pumped full of air when it is desired to lift the craft over a shoal. The rude model, apparently

made with a pocket knife, and bearing Lincoln's signature, may still be seen in the patent office at Washington. On this trip Lincoln for the first time, at New Orleans, saw slaves chained and scourged; and from this dates his life-long detestation of slavery. On his return he received a formal challenge from a celebrated wrestler to a trial of strength, accepted it because he valued his popularity among "the boys," and was victorious. Various incidents of this sort are related of his life at New Salem, 20 m. northwest of Springfield, where he was clerk in a country store from August, 1831, till the spring of 1832, when his employer became bankrupt. During this time he piloted the first steamboat that attempted the navigation of the Sangamon. When the store was closed, he enlisted as a private in a company raised for the Black Hawk war, but was at once chosen captain. When these volunteers were mustered out in May, Lincoln reënlisted as a private in an "independent spy company." When the war was over they were disbanded at Whitewater, Wis., and as Lincoln's horse had been stolen, he made his way home on foot and on a raft down the Illinois. When in the fall of 1832 he became a candidate for the state legislature, his political position was not very clearly defined; his principles accorded most nearly with those of the whig party, then in process of formation, but he had a personal admiration for Jackson. He canvassed the district, but was defeated, though he received the almost unanimous vote of his own precinct. He next bought a store, with a partner named Berry, and was postmaster of New Salem from May, 1833, till 1836, when the office was discontinued. Berry proved a drunkard, and the firm became bankrupt; Berry died soon after, and Lincoln paid the debts, discharging the last one in 1849. After studying law for a few months, he accepted an invitation from the county surveyor to become his deputy. He studied six weeks, entered upon the work, and soon became known as an expert surveyor; but in the autumn of 1834 his instruments were sold under a sheriff's execution. In the same year he was elected to the legislature as a whig, receiving a larger majority than any other candidate on the ticket. In the legislature he was a member of the committee on public accounts and expenditures. He was reelected in 1836, and served on the finance committee, and again in 1838 and 1840, in both of the latter terms being the whig candidate for speaker. His efforts in the legislature were mainly for the inauguration of a general system of internal improvements. In 1836 he first met Stephen A. Douglas, who was then at the capital seeking a political appointment. In March, 1837, the democratic majority in the legislature passed some pro-slavery resolutions, against which Lincoln and a member named Stone entered a protest on the journal of the house. Lincoln had been admitted to the bar in 1837, and with John T. Stuart opened an office at Springfield, whither

the capital was removed in 1839. His subsequent partners were Stephen T. Logan and William H. Herndon. He became noted for his ability in jury trials, and finding that legislative service interfered with his practice, he declined another reelection. On Nov. 4, 1842, he married Mary, daughter of the Hon. Robert S. Todd of Lexington, Ky. Lincoln was a candidate for presidential elector in 1840, and again in 1844, and each time canvassed the state for the whig candidates, being frequently pitted against Stephen A. Douglas in joint debate. He was a warm admirer of Henry Clay, whose defeat was a sore disappointment to him. He was elected to congress in 1846 by a majority of 1,500, his competitor on the democratic ticket being the Rev. Peter Cartwright, and was the only whig representative from Illinois in the 30th congress. He was a member of the committees on post offices and post roads and war department expenses, vigorously opposed the administration of President Polk, and denounced the war with Mexico as unjust, though he always voted for the appropriations to defray its expenses. When Polk declared in a message that the Mexicans had "invaded our territory, and shed the blood of our fellow citizens on our own soil," Lincoln introduced what became famous as "the spot resolutions," wherein the president was called upon to designate the spot where the alleged outrage had been committed. His first speech in congress, Jan. 12, 1848, was in support of these resolutions, and sharply discussed the weak points of the message. He voted for the reception of anti-slavery petitions, for inquiries into the constitutionality of slavery in the District of Columbia, and the expediency of abolishing the slave trade in the district, and for the Wilmot proviso. On Jan. 16, 1849, he introduced a bill for abolishing slavery in the District and compensating the slave owners, provided a majority of the citizens should vote in favor of it. He declined to be a candidate for reelection. In the whig national convention of 1848 he advocated the nomination of Gen. Taylor, and during the ensuing canvass he spoke frequently in New England. In 1849 he was an unsuccessful candidate for United States senator against Gen. Shields. President Fillmore offered him the governorship of Oregon, which he declined. On July 16, 1852, he delivered at Springfield a eulogy on Henry Clay. The repeal of the Missouri compromise brought him again into the political arena, and he became the acknowledged leader of his party in Illinois. To his withdrawing from the contest for United States senator in 1855 was due the election of Mr. Trumbull over Gen. Shields. Once or twice during the canvass he met Mr. Douglas in debate, and on one of these occasions (Springfield, Oct. 4) he made one of the most powerful and successful speeches of his whole life; the fallacy of Douglas's "great principle" was effectually exposed in a single sentence: "I admit that the emigrant to Kansas



and Nebraska is competent to govern himself, but I deny his right to govern any other person without that person's consent." In the republican national convention of 1856 the Illinois delegation presented Mr. Lincoln's name for the vice presidency, and on the informal ballot he received 110 votes, standing next to the Hon. William L. Dayton, who was nominated. Lincoln was placed at the head of the electoral ticket in Illinois, and canvassed the state. In June, 1858, the republican convention at Springfield nominated him for United States senator in place of Stephen A. Douglas, who was a candidate for reelection. In accepting the nomination he delivered before the convention a carefully prepared speech, which opened as follows:

"If we could first know where we are, and whither we are tending, we could better judge what to do and how to do it. We are now far into the fifth year since a policy was initiated with the avowed object and confident promise of putting an end to slavery agitation. Under the operation of that policy that agitation has not only not ceased, but has constantly augmented. In my opinion, it will not cease until a crisis shall have been reached and passed. 'A house divided against itself cannot stand.' I believe this government cannot endure permanently half slave and half free. I do not expect the Union to be dissolved, I do not expect the house to fall, but I do expect it will cease to be divided. It will become all one thing, or all the other. Either the opponents of slavery will arrest the further spread of it, and place it where the public mind shall rest in the belief that it is in the course of ultimate extinction, or its advocates will push it forward till it shall become alike lawful in all the states, old as well as new, north as well as south."

This became famous as the "house-divided-against-itself speech." On a challenge from Lincoln he and Douglas canvassed the state together, speaking in joint debate seven times. The main question under discussion was whether Kansas should be admitted to the Union as a free state or as a slave state; the struggle was at its height, the Dred Scott decision had intensified public interest, and the debate drew the attention of the whole country. In the course of it, in reply to questions from his antagonist, Lincoln said:

"I do not now, nor ever did, stand in favor of the unconditional repeal of the fugitive slave law. I do not now, nor ever did, stand pledged against the admission of any more slave states into the Union. I do not stand pledged against the admission of a new state into the Union with such a constitution as the people of that state may see fit to make. I do not stand to-day pledged to the abolition of slavery in the District of Columbia. I do not stand pledged to the prohibition of the slave trade between the different states. I am impliedly, if not expressly, pledged to a belief in the right and duty of congress to prohibit slavery in all the United States territories."

Douglas's continual assumptions of superiority and sneers at Lincoln's early poverty and occupations were met with humorous retorts and sharp exposures of sophistry; and his antagonist finally drove him to the necessity of taking ground against the Dred Scott decision, which ultimately prevented his harmonious nomination by the democratic party, and consequently his elevation to the presidency. It was generally conceded that Lincoln had the best of the argument, and on the popular vote he had a plurality of more than 4,000 over Douglas; but the legislative districts were so

arranged that the democrats returned a majority of eight members, and Douglas was therefore reelected. In the autumn of 1859 Lincoln was called to Ohio to reply to Douglas, who had entered the canvass for the democratic state ticket. The latter had published in "Harper's Magazine" an elaborate exposition of his doctrine of "popular sovereignty," and Lincoln's speech included a masterly review of the article. Later in the year he visited Kansas, where he was received enthusiastically and spoke at various places. In February, 1860, he addressed a large meeting in Cooper institute, New York, making one of his most memorable speeches, in which he showed the subsequent action of the framers of the constitution in reference to slavery. He then visited New England, speaking at several places.—The republican national convention met in Chicago on May 16, adopted a platform on the 17th, which denied "the authority of congress, of a territorial legislature, or of any individuals to give legal existence to slavery in any territory of the United States," and balloted for candidates on the 18th. On the first ballot William H. Seward received 173½ votes, Abraham Lincoln 102, and the others were divided among several candidates; on the second ballot Seward had 184½ and Lincoln 181; the third gave Lincoln 231½, lacking but 2 of a majority, and before the result was announced four votes of the Ohio delegation were changed in his favor; other votes were changed rapidly, and the nomination of Lincoln was declared. Hannibal Hamlin was then nominated for vice president. The democratic party was divided; the extreme southern wing nominated John C. Breckenridge for the presidency, and the northern wing Stephen A. Douglas, while John Bell received the nomination of the "constitutional union" party, composed of anti-Lecompton democrats, "know-nothings," and old-line whigs. The canvass in some respects resembled the famous one of 1840; the log-cabin emblems of the one were paralleled by the rail-splitting figures of the other, and "honest old Abe" was a familiar watchword. Yet beneath all the noise and nonsense was an almost universal conviction that a great crisis had been reached. For more than 20 years Mr. Lincoln had constantly come into political collision with Mr. Douglas, and in this last contest, for the highest prize in the gift of the nation, he found him once more his chief competitor. The election, held on Nov. 6, resulted in the following popular vote: in favor of Lincoln, 1,866,452; Douglas, 1,291,574; Breckenridge, 850,082; Bell, 646,124. The electoral vote gave Lincoln 180, Breckenridge 72, Bell 39, and Douglas 12. The period between Lincoln's election and inauguration was full of unusual perplexity. From the peculiar state of public feeling, and his own pre-eminent good nature, he desired to fill some of the more important offices with able men chosen from among his opponents; but this

was rendered difficult, if not impossible, by the fact that some of the southern states had already seceded and others were threatening to do so, and the probability that the men in question would go with their states. He contemplated offering a seat in the cabinet to Alexander H. Stephens, and did make such an offer to James Guthrie of Kentucky and John A. Gilmer of North Carolina, who declined it. At Harrisburg, on his way to Washington, he was informed of a plot to assassinate him on his passage through Baltimore, and at the urgent solicitation of his friends he went through on an earlier train than the one appointed, reaching the capital on Saturday morning, Feb. 23. He was inaugurated on March 4, and delivered a long address, in which he said:

"I take the official oath to-day with no mental reservation, and with no purpose to construe the constitution or laws by any hypercritical rules. . . . I hold that, in contemplation of universal law and of the constitution, the union of these states is perpetual. Perpetuity is implied, if not expressed, in the fundamental law of all national governments. It is safe to assert that no government proper ever had a provision in its organic law for its own termination. . . . I therefore consider that, in view of the constitution and the laws, the Union is unbroken, and to the extent of my ability I shall take care, as the constitution itself expressly enjoins upon me, that the laws of the Union be faithfully executed in all the states. In doing this there need be no bloodshed or violence, and there shall be none unless it be forced upon the national authority. The power confided to me will be used to hold, occupy, and possess the property and places belonging to the government, and to collect the duties and imposts; but beyond what may be necessary for these objects there will be no invasion, no using of force against or among the people anywhere. . . . In your hands, my dissatisfied fellow countrymen, and not in mine, is the momentous issue of civil war. The government will not assail you. You can have no conflict without being yourselves the aggressors. You have no oath registered in heaven to destroy the government; while I shall have the most solemn one to preserve, protect, and defend it."

His cabinet, as first formed, was as follows: William H. Seward, secretary of state; Salmon P. Chase, secretary of the treasury; Simon Cameron, secretary of war; Gideon Welles, secretary of the navy; Caleb B. Smith, secretary of the interior; Montgomery Blair, postmaster general; Edward Bates, attorney general. Several of these had been among his competitors for the presidential nomination. Seven states had formally seceded from the Union, and there was danger that seven others would follow them, four of which ultimately did. During the preceding administration large quantities of arms and ammunition had been removed from the national arsenals in the north to those in the south, where they were seized by the governments of the seceding states; the army, only 16,000 strong, had been sent to remote parts of the country, and many of its best officers were going with their states; the navy had been scattered in distant seas; the treasury was empty; and the border states, heartily sympathizing with the southern, but unwilling to stand between two hostile powers, constituted the most uncertain element in the novel problem. On March 13 Messrs. Forsyth and Crawford, as "commissioners from a government composed of seven states which had withdrawn from the Ameri-

can Union," signified their desire to enter upon negotiations for the adjustment of questions growing out of the separation; but the secretary of state, by direction of the president, declined to receive them, as "it could not be admitted that the states referred to had, in law or fact, withdrawn from the federal Union, or that they could do so in any other manner than with the consent and concert of the people of the United States, to be given through a national convention." The delivery of this communication was withheld, by consent of the commissioners, until April 8, when it was speedily followed by the bombardment of Fort Sumter, which precipitated the civil war. On April 15 President Lincoln issued a proclamation calling out the militia of the several states to the number of 75,000; on the 19th he proclaimed a blockade of the ports in all the seceded states; on May 3 he called for 42,000 three years' volunteers, and ordered the addition of 22,114 officers and men to the regular army and 18,000 seamen to the navy. The attitude assumed by the administration toward the great powers of Europe, which with the exception of Russia showed an unfriendly disposition from the outset, is clearly indicated by a passage in the letter of instructions furnished to Mr. Adams, minister to England:

"You will in no case listen to any suggestions of compromise by this government, under foreign auspices, with discontented citizens. If, as the president does not at all apprehend, you shall unhappily find her majesty's government tolerating the application of the so-called seceding states, or wavering about it, you will not leave them to suppose for a moment that they can grant that application and remain the friends of the United States. You may even assure them promptly, in that case, that if they determine to recognize, they may at the same time prepare to enter into alliance with the enemies of this republic."

On June 15 the British and French ministers at Washington asked permission to read to the secretary of state instructions received from their governments. Finding that the paper contained a decision of the British government, to the effect that the United States was divided into two coordinate belligerent parties, between whom Great Britain proposed to assume the attitude of a neutral, the administration declined to receive it officially. When in the following November Capt. Wilkes took the confederate commissioners Mason and Slidell from the British mail steamer Trent, in the Bahama channel, the administration refused to sanction the act and liberated the commissioners (Dec. 26), on the ground that he should have brought the steamer into port for adjudication, instead of assuming to decide for himself as to the liability of the commissioners to capture. The president called an extra session of congress, to meet on July 4. On account of the withdrawal of the southern members, the republicans had a large majority in each house. The president sent in a message in which he recited the facts of the insurrection, discussed the fallacy of state sovereignty, and asked for 400,000 men and \$400,000,000 to maintain the su-

premacny of the Union by a short and decisive contest. Congress promptly passed bills ratifying the acts of the president, authorizing him to accept 500,000 volunteers, and placing \$500,000,000 at the disposal of the administration, and confiscating all slaves used in military operations against the government. The house also passed, almost unanimously, a resolution pledging any amount of money and any number of men necessary to suppress the rebellion, and one declaring that the sole object of the war was to preserve the Union. The session closed on Aug. 6, 16 days after the battle of Bull Run. On Oct. 31 Gen. Scott asked to be relieved from command of the army, and the president appointed as his successor Gen. George B. McClellan, who had rendered good service in Western Virginia. On Jan. 14, 1862, Mr. Cameron was succeeded in the war department by Edwin M. Stanton, who performed the duties of the office throughout the remainder of Lincoln's administration with extraordinary zeal and ability. To prevent the border states from joining the confederacy was still the most difficult portion of the president's task, and in pursuance of this object he steadily resisted the appeals of those who advised a general emancipation, and the instructions issued to the commanders of the various departments enjoined the least practicable interference with slavery. An order by Gen. Hunter (May 9, 1862) declaring the slaves in Georgia, Florida, and South Carolina for ever free, was repudiated and rescinded by the president, who at the time was urging upon congress and the border states a policy of gradual emancipation, with compensation to loyal masters, to be followed by the colonization of such freedmen as might wish to leave the country. Congress passed a resolution that "the United States ought to cooperate with any state which might adopt a gradual emancipation of slavery," and placed at the disposal of the president \$600,000 for an experiment at colonization. About \$80,000 was spent in attempts to colonize liberated slaves in New Granada and Hayti, and the project was then abandoned. On Aug. 22, 1862, in reply to an open letter addressed to him by Horace Greeley, Mr. Lincoln wrote:

"My paramount object is to save the Union, and not either to save or destroy slavery. If I could save the Union without freeing any slave, I would do it; if I could save it by freeing all the slaves, I would do it; and if I could do it by freeing some and leaving others alone, I would also do that. I shall try to correct errors when shown to be errors, and I shall adopt new views so fast as they shall appear to be true views. I have here stated my purpose according to my views of official duty, and I intend no modification of my oft expressed personal wish that all men everywhere could be free."

To a deputation from all the religious denominations in Chicago, who urged immediate and universal emancipation, the president replied at considerable length, arguing the probable futility of such a measure. But meanwhile he prepared a declaration that on Jan. 1, 1863, the slaves in all states or parts of states which

should then be in rebellion would be proclaimed free. By the advice of Mr. Seward this was withheld until it could follow a federal victory, instead of seeming to be a measure of mere desperation. Accordingly it was put forth Sept. 22, 1862, five days after the battle of Antietam had defeated Lee's first attempt at invasion of the north, and the promised proclamation was published on the 1st day of January following. In his message of Dec. 1, 1862, the president had proposed to congress a constitutional amendment for the abolition of slavery, with compensation, in the year 1900. A supplemental treaty with Great Britain for the suppression of the African slave trade was made on Feb. 17, 1863, and duly ratified.—After Gen. McClellan assumed command of the army of the Potomac, six months passed and no active operations had been set on foot. The president then (January, 1862) ordered a general movement of the land and naval forces against the enemy, to begin on Feb. 22, and specifically ordered Gen. McClellan to organize an expedition for seizing a point on the railroad southwest of Manassas Junction. The general protested, had several conferences with the president, and urged his own plan of a movement up the peninsula, to which Mr. Lincoln finally assented after a council of 12 general officers had decided, 8 to 4, in favor of it (see CHICKAHOMINY); and during the months of delay which followed he constantly urged a rapid forward movement. During the operations on the peninsula the president and Gen. McClellan had a tangled correspondence, in which the latter repeatedly called for reinforcements, promised to move, explained why he did not move, and set forth his views as to the general policy of the government; while the president, after promising him McDowell's corps, told him there were no other troops to be obtained, and besought him to use his opportunities with what he had. After the battle of Antietam (Sept. 16, 17, 1862) he again urged McClellan to follow the retreating confederates across the Potomac and advance upon Richmond. A most extraordinary correspondence ensued, in which the president set forth with great clearness the conditions of the military problem and the advantages that would attend a prompt movement by interior lines toward the confederate capital. Tired at length of McClellan's varied excuses for delay, he removed him from command on Nov. 7, 1862, and appointed Gen. Burnside in his place. The military operations of 1862 elsewhere than in Virginia were nearly all successful. The president's order for a general movement in February was speedily followed by the capture of Forts Henry and Donelson; the confederate forces were driven out of Missouri, Kentucky, and a large portion of Tennessee; a base was established by Burnside's expedition on the coast of North Carolina; the western coast of Florida was reclaimed; Fort Pulaski, guarding the entrance to Savan-

nah harbor, was reduced; and New Orleans was captured. But Mr. Adams, United States minister at London, found it impossible to induce the British government to stop the fitting out of confederate privateers in English ports, though in repeated instances he offered the most specific evidence as to the character of the vessels. When the No. 290, afterward famous as the Alabama, escaped from the yard of the Messrs. Laird at Birkenhead (July, 1862), the British government was notified that the United States would hold it responsible for whatever damage the vessel might inflict on American commerce. On Sept. 5, 1863, Earl Russell, the secretary for foreign affairs, having announced to Mr. Adams that the government would do nothing to prevent the fitting out in Liverpool of two iron-clad rams for the confederates, Mr. Adams in his reply said: "It would be superfluous in me to point out to your lordship that this is war. . . . In my belief it is impossible that any nation, retaining a proper degree of self-respect, could tamely submit to a continuance of relations so utterly deficient in reciprocity." The British government receded from the position it had taken, and ordered the detention of the rams. A few days later Mr. Adams received from Washington instructions to do that which he had already done, and the letter added: "If this condition of things is to remain and receive the deliberate sanction of the British government, the navy of the United States will receive instructions to pursue these enemies into the ports which thus, in violation of the law of nations and the obligations of neutrality, become harbors for the pirates." The emperor of the French, after failing to secure the coöperation of England and Russia in an attempt at mediation between the federal government and the confederates, made the offer alone, intimating that separation was "an extreme which could no longer be avoided." The president's reply, Feb. 6, 1863, after briefly reciting what had been accomplished in recapturing large portions of the seceded states, emphatically rejected the idea that the government could ever consent to hold a conference with rebels in arms to discuss a possible dissolution of the Union, and pointed out the fact that the empty seats in congress were still accessible to representatives constitutionally chosen from the insurrectionary states, and that congress was the proper and sufficient arbiter on all questions between the states and the general government. This put an end to the talk of foreign intervention. In December, 1862, Secretary Smith was succeeded by John P. Usher of Indiana. West Virginia was admitted into the Union on the 31st.—The president had first suspended the writ of *habeas corpus* on May 3, 1861, in an order addressed to the commander of the forces on the Florida coast. On the 27th of the same month Gen. Cadwalader, being authorized by the president, refused to obey a writ issued by

Chief Justice Taney for the release of a Maryland secessionist imprisoned in Fort McHenry. The chief justice then read an opinion that the president could not suspend the writ, and most of the journals opposed to the administration violently assailed its action; whereupon some of them were refused transmission in the mails, and at the same time restrictions were placed upon the use of the telegraph. The suspension of the writ was continued in spite of the opinion of the chief justice, and under it, on Sept. 16, nine members of the Maryland house of delegates, with the officers of both houses, were arrested by Gen. McClellan to prevent the passage of an ordinance of secession which was contemplated for the next day. Congress passed an act (December, 1861) approving the action of the president, and authorizing the suspension of the writ so long as he should deem it necessary. In July, 1862, Attorney General Bates sent in an elaborate opinion on the subject, favorable to suspension; and thereafter the war department, to which the power had been transferred in February, exercised it freely for the imprisonment of notorious or suspected spies and secessionists, and of persons in the northern states who discouraged enlistments, opposed drafts, or promoted desertions. The most noted case was that of Clement L. Vallandigham, who for a violent disunion speech was arrested by Gen. Burnside, May 4, 1863, and condemned by a military commission to imprisonment; the president commuted the sentence to banishment beyond the military lines. The affair created considerable excitement, and the action of the government was formally condemned by a large meeting of opponents of the administration at Albany, N. Y., among whom was the governor of the state, and by similar meetings elsewhere. In reply to the Albany resolutions the president wrote a letter in which he discussed at considerable length and in his usual clear and forcible style the constitutional provision for suspension of the writ and its application to the circumstances then existing. At the next state election in Ohio Mr. Vallandigham was the democratic candidate for governor, but was defeated by a majority of 100,000.—Colored soldiers were first enlisted into the federal service in January, 1863, and within the year their number reached 100,000, about 50,000 actually bearing arms; before the close of the war they numbered about 170,000. These were not assigned as state troops, though credited to the quotas of the states from which they enlisted, but mustered in as "United States colored volunteers." The atrocities committed by the confederates when colored soldiers were captured, caused the president to issue an order, July 30, 1863, that "for every soldier of the United States killed in violation of the laws of war, a rebel soldier shall be executed; and for every one enslaved by the enemy or sold into slavery, a rebel soldier shall be placed at hard labor on the public works."

But Mr. Lincoln's natural tender-heartedness prevented him from ever ordering such an execution. In July serious riots occurred in the city of New York in opposition to the draft, and Gov. Seymour addressed a letter to the president, complaining of unjust apportionments, and asking that the draft be suspended until the constitutionality of the law could be tested in the courts. The president replied that he would take measures to remedy unjust apportionments, but refused to waste time by waiting the slow process of judicial decisions, and the draft was continued.—Gen. Burnside had lost the battle of Fredericksburg in December, 1862, and in January was succeeded by Gen. Hooker, who met with a severe check at Chancellorsville in May, and in June was succeeded by Gen. Meade, who won the battle of Gettysburg, July 1–3, which destroyed the last hope of invading the north, and proved to be the turning point of the war. At the dedication of the cemetery in which the slain of this battle were buried (Nov. 19, 1863) President Lincoln made a brief address which is perhaps the finest ever delivered on a similar occasion, and has become familiar to the entire English-reading world:

“Fourscore and seven years ago our fathers brought forth upon this continent a new nation, conceived in liberty and dedicated to the proposition that all men are created equal. Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle field of that war. We have come to dedicate a portion of that field as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this. But in a larger sense we cannot dedicate, we cannot consecrate, we cannot hallow this ground. The brave men, living and dead, who struggled here, have consecrated it far above our power to add or detract. The world will little note, nor long remember, what we say here; but it can never forget what they did here. It is for us, the living, rather to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us; that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion; that we here highly resolve that these dead shall not have died in vain; that this nation, under God, shall have a new birth of freedom; and that government of the people by the people and for the people shall not perish from the earth.”

The surrender of Vicksburg and Port Hudson early in July restored the Mississippi to federal control, and divided the confederacy in twain. The president appointed the 6th of August for a day of national thanksgiving. In the autumn elections of 1862 many states had given majorities for the party opposed to the administration; in those of 1863 every state except New Jersey was carried by its friends. On Dec. 8 the president by proclamation offered full pardon to all then in arms against the government (except civil and diplomatic officers of the confederate government, soldiers above the rank of colonel, those who had resigned seats in congress or commands in the national service, and a few others), on condition of their taking a prescribed oath to defend the constitution and the Union and all acts of congress and proclamations of the president respecting slavery, so far as not modified or declared void

by the supreme court.—A new peril was seen in the entrance of a French army into Mexico, ostensibly to enforce the rights of French citizens there, but really to enthrone the arch-duke Maximilian as its emperor. In September, 1863, Mr. Dayton, United States minister at Paris, was directed to call the attention of the French government to the apparent deviations of the forces in Mexico from the assurances that permanent occupation was not intended; and in a despatch dated a few days later the position of the administration was set forth at length:

“The United States have neither the right nor the disposition to intervene by force on either side in the lamentable war which is going on between France and Mexico. On the contrary, they practise in regard to Mexico, in every phase of that war, the non-intervention which they require all foreign powers to observe in regard to the United States. But notwithstanding this self-restraint, this government knows full well that the inherent normal opinion of Mexico favors a government in preference to any monarchical institutions to be imposed from abroad. This government knows also that this normal opinion of the people of Mexico resulted largely from the influence of popular opinion in this country, and is continually invigorated by it. The president believes, moreover, that this popular opinion of the United States is just in itself and eminently essential to the progress of civilization on the American continent, which civilization, it believes, can and will, if left free from European resistance, work harmoniously together with advancing refinement on the other continents.

“Nor is it necessary to practise reserve upon the point that if France should, upon due consideration, determine to adopt a policy in Mexico adverse to the American opinion and sentiments which I have described, that policy would probably scatter seeds which would be fruitful of jealousies which might ultimately ripen into collision between France and the United States and other American republics.”

The request of the French government that the United States would recognize the government of Maximilian was steadily refused, and the action of the administration was approved by the house of representatives in a resolution of April 4, 1864.—On Oct. 16, 1863, the president had called for 300,000 volunteers, to take the place of those whose term was about to expire; and on March 15, 1864, he called for 200,000 more, to supply the navy and provide a reserve for contingencies. The grade of lieutenant general was revived, and on March 9 the president gave the commission to Gen. Grant, who thus became commander-in-chief of all the armies (a post previously held by Gen. Halleck), and took personal command of the army of the Potomac. In April the governors of Ohio, Indiana, Illinois, Iowa, and Wisconsin offered the government a force of 100,000 men for 100 days' service, which was accepted. When Gen. Grant was about to launch out on the campaign of 1864, the president wrote to him, under date of April 30: “Not expecting to see you before the spring campaign opens, I wish to express in this way my entire satisfaction with what you have done up to this time, so far as I understand it. The particulars of your plans I neither know nor seek to know. You are vigilant and self-reliant; and, pleased with this, I wish not to obtrude any restraints or constraints upon you. If there be anything wanting which is within my power to give, do not fail to let me know it.” For the general



plan and scope of the campaign, see GRANT, ULYSSES S.; for descriptions of the battles, see WILDERNESS, SPOTTSYLVANIA, and PETERSBURG. On May 18, just after the bloody struggle at Spottsylvania, a spurious proclamation, announcing that Grant's campaign was closed, appointing a day of fasting, humiliation, and prayer, and ordering a new draft for 400,000 men, found its way into the New York "World" and "Journal of Commerce." The other morning papers, suspecting its character, refused to publish it. It was issued just as the mails were being made up for Europe, and was telegraphed all over the country before the fraud was discovered. By order of the president, the offices of those two journals were closed and their publication suspended until it should be made apparent that they had published the proclamation in good faith. This action was denounced as an outrage on the liberty of the press, and Gov. Seymour attempted to have Gen. Dix and others indicted for it. On June 22 Mr. Lincoln visited the army before Petersburg, and met with a hearty reception; but the country felt a keen disappointment that the bloody march from the Rappahannock to the James had not resulted in the immediate capture of the confederate capital or destruction of the confederate army, and congress, just before adjourning on July 4, requested the president to appoint a day of fasting and prayer. The general depression was somewhat relieved by news of the sinking of the Alabama, but returned when Early's raid down the Shenandoah and across the Potomac threatened Washington. The fugitive slave law was repealed in June, 1864, and about the same time, in an interview with some gentlemen from the west, Mr. Lincoln said: "There have been men base enough to propose to me to return to slavery our black warriors of Port Hudson and Olustee, and thus win the respect of the masters they fought. Should I do so, I should deserve to be damned in time and eternity. Come what will, I will keep my faith with friend and foe. My enemies pretend I am now carrying on this war for the sole purpose of abolition. So long as I am president it shall be carried on for the sole purpose of restoring the Union; but no human power can subdue this rebellion without the use of the emancipation policy and every other policy calculated to weaken the moral and physical forces of the rebellion."—The national republican convention, June 8, 1864, renominated Mr. Lincoln, with Andrew Johnson for vice president. The platform approved "the determination of the government of the United States not to compromise with rebels, nor to offer any terms of peace except such as may be based upon an unconditional surrender," and recommended the complete prohibition of slavery throughout the United States by constitutional amendment. Secretary Chase resigned on June 30, and was succeeded on July 5 by William P. Fessenden. On July 18 the president called

for 500,000 men, ordering a draft in case the quotas were not filled by Sept. 5. In that time volunteering reduced the number required to 300,000. The democratic convention, Aug. 29, nominated Gen. McClellan for president and George H. Pendleton for vice president. The essential portion of the platform was the following resolution:

"That this convention does explicitly declare, as the sense of the American people, that, after four years of failure to restore the Union by the experiment of war, during which, under the pretence of a military necessity, of a war power higher than the constitution, the constitution itself has been disregarded in every part, and public liberty and private rights alike trodden down, and the material prosperity of the country essentially impaired, justice, humanity, liberty, and the public welfare demand that immediate efforts be made for a cessation of hostilities, with a view to an ultimate convention of all the states, or other peaceable means to the end that at the earliest practicable moment peace may be restored on the basis of the federal union of the states."

Although the force of this resolution was materially reduced by the news of the fall of Fort Morgan and by the immediately following capture of Atlanta, the issue thus squarely presented was maintained throughout the canvass, and the election was looked to for a popular verdict whether the war should be continued. A convention of radical republicans, held at Cleveland, Ohio, May 31, had nominated John C. Fremont, who in September withdrew from the contest. A fragment of the republican party attempted a movement for the nomination of Gen. Grant; but his prompt declaration that he would not be a candidate put an end to it. The action of the government in surrendering to the Spanish authorities Don José Agustín Arguelles, charged with selling a cargo of negroes into slavery in Cuba, was used as a political weapon against Mr. Lincoln, and Senator Wade of Ohio and Representative Davis of Maryland (both republicans) made a violent attack on him for refusing to sign a reconstruction bill which had been passed by congress on the last day of the session. The refusal of the confederate authorities to exchange colored soldiers captured in battle, and their demand (as a condition of the release of civilians carried off from Pennsylvania by Lee) that the government agree not to arrest any one on account of his opinions or his sympathy with the confederate cause, resulted in a suspension of the system of exchanges. When Sherman seemed likely to effect the release of the prisoners at Andersonville, the confederate government offered to forego its discrimination against colored soldiers, and exchange man for man; which offer was of course declined. The ill treatment of federal prisoners in the southern stockades then became more barbarous than ever, and the opposition journals boldly held Lincoln's administration alone responsible for the suffering caused thereby. In July several agents of the confederate government appeared at Clifton, Canada, and communicated with Mr. Horace Greeley on the subject of peace, professing to be authorized to negotiate for that end, and asking for safe-conduct

to Washington, that they might confer with the president. Mr. Lincoln wrote the safe-conduct and intrusted it to Mr. Greeley, who, finding that the supposed commissioners were not authorized to do or say anything definite, would not deliver it without further instructions. Considerable correspondence ensued, and then the president sent the following by his private secretary, which was delivered to the confederate agents on July 20:

*"To whom it may concern:* Any proposition which embraces the restoration of peace, the integrity of the whole Union, and the abandonment of slavery, and which comes by and with an authority that can control the armies now at war against the United States, will be received and considered by the executive government of the United States, and will be met by liberal terms on substantial and collateral points, and the bearer or bearers thereof shall have safe-conduct both ways."

On receipt of this, the confederate agents addressed a long letter to Mr. Greeley, declaring that it "precluded negotiation, and prescribed in advance the terms and conditions of peace," and revealing in the closing paragraphs that the main if not the sole purpose of the proceeding had been to influence the pending presidential election. Mr. Lincoln was charged with having suddenly and entirely changed his views and the terms on which the agents were to be received at Washington. At the president's request, Postmaster General Blair resigned on Sept. 23, and William Denison of Ohio was appointed in his place. During September and October Gen. Sheridan, by several brilliant victories, swept the Shenandoah valley clean of the confederate forces that had occupied it under Early. Hood was defeated in all his operations against Sherman's communications, and finally dashed himself to pieces against the defences of Nashville. The early state elections in Maine, Vermont, Pennsylvania, Ohio, and Indiana were carried by the republicans, and Maryland, by a close vote, adopted a new constitution forbidding slavery. As the presidential election approached, threats and rumors of revolution at the north were rife, and a body of soldiers under Gen. Butler was sent to New York to prevent an outbreak. Such precautions were taken in other places also that the election was the quietest ever known, though a heavy vote was polled. On the popular vote Lincoln received 2,213,665; McClellan, 1,802,237. The latter carried New Jersey, Delaware, and Kentucky, while all the other states which held an election gave their votes to Lincoln. Alabama, Arkansas, Florida, Georgia, Mississippi, North Carolina, South Carolina, Texas, and Virginia held no election. In responding to a serenade, Nov. 10, the president said: "So long as I have been here I have not willingly planted a thorn in any man's bosom. While I am duly sensible to the high compliment of a reelection, and duly grateful, as I trust, to Almighty God for having directed my countrymen to a right conclusion, as I think, for their good, it adds nothing to my satisfaction that any other man may be disap-

pointed by the result. May I ask those who have not differed with me to join with me in this same spirit toward those who have?" In counting the electoral votes, congress excluded those of Louisiana and Tennessee; their admission, however, would not have changed the result. The total number counted was 233, of which Lincoln and Johnson had 212, McClellan and Pendleton 21. On Nov. 19 the president by proclamation opened the ports of Norfolk, Va., and Fernandina, Fla. The confederate cruiser Florida, while in the port of Bahia, Oct. 7, had been seized by a man-of-war, and the affair caused a slight disturbance in the diplomatic relations between the United States and Brazil. But the government promptly disowned the act of the commander, surrendered the crew, and was only prevented from restoring the Florida by the fact that she sunk in Hampton Roads from injuries received in a collision. Attorney General Bates resigned on Dec. 1, and was succeeded by James Speed of Kentucky. Chief Justice Taney had died in October, and on Dec. 6 the president conferred the office on Salmon P. Chase. The annual message to congress (Dec. 6, 1864) closed with this paragraph:

"In presenting the abandonment of armed resistance to the national authority on the part of the insurgents as the only indispensable condition to ending the war on the part of the government, I retract nothing heretofore said as to slavery. I repeat the declaration made a year ago, that while I remain in my present position I shall not attempt to retract or modify the emancipation proclamation. Nor shall I return to slavery any person who is free by the terms of that proclamation or by any of the acts of congress. If the people should, by whatever mode or means, make it an executive duty to reenslave such persons, another, and not I, must be their instrument to perform it. In stating a single condition of peace, I mean simply to say that the war will cease on the part of the government whenever it shall have ceased on the part of those who began it."

—As the call of July 18 had been largely filled by the application of credits for men previously enlisted, the president on Dec. 19 called for 200,000 more. The release by a Canadian justice of raiders who had recrossed to Canada after committing robbery and murder in St. Albans, Vt., when they were demanded under the extradition treaty, caused intense indignation; but an order by Gen. Dix directing the troops under his command to cross the border if necessary to capture such raiders in future, was promptly revoked by the president. The latter, however, ordered that no person should enter the country without a passport, except emigrants coming directly by sea; and congress directed the president to give notice to the Canadian government of the termination of the reciprocity treaty, which was made in 1854 and had proved largely advantageous to Canada. Sherman completed his grand march through Georgia in time to present the government with the city of Savannah "as a Christmas gift;" Grant's lines were extended further around Petersburg, cutting off the Weldon railroad; and in January Fort Fisher, commanding the harbor of Wilmington, where blockade-running had been most successful,

was captured by a desperate assault. The house of representatives on Jan. 31 passed a resolution submitting to the legislatures a constitutional amendment abolishing slavery, which had been passed by the senate early in the preceding term. In January Mr. Francis P. Blair went to Richmond on his own responsibility, and returned on the 16th bearing a letter addressed to himself, wherein Jefferson Davis expressed his willingness to "renew the effort to enter into a conference with a view to secure peace between the two countries." The president at once authorized Mr. Blair to return to Richmond, carrying a written assurance that Mr. Lincoln was "ready to receive any agent whom Mr. Davis, or any other influential person now resisting the national authority, may informally send me, with a view of securing peace to the people of our common country." On Jan. 29 Alexander H. Stephens, R. M. T. Hunter, and J. A. Campbell applied for permission to enter the federal lines and negotiate for peace. On Feb. 3 President Lincoln and Secretary Seward held an informal conference with them of four hours' duration, on a gunboat in Hampton Roads. The president insisted that three things were indispensable to any formal settlement: 1, restoration of the national authority throughout all the states; 2, no receding from the position of the national executive on the subject of slavery; 3, no cessation of hostilities short of an end of the war and the disbanding of the forces hostile to the government. The confederate commissioners broached the idea that if hostilities were suspended while the two governments united in driving the French out of Mexico and practically upholding the Monroe doctrine, the result would probably be a better feeling between the people of the two sections, and the restoration of the Union. This was rejected as too vague, and the conference had no practical result except as it gave the people a renewed assurance of Mr. Lincoln's firmness.—The morning of Lincoln's second inauguration was very stormy, but the sky cleared just before noon, and the sun shone brightly as he appeared before an immense throng in front of the capitol, took the oath, and delivered an address remarkable alike for its striking expressions and conciliatory spirit. He said:

"On the occasion corresponding to this four years ago, all thoughts were anxiously directed to an impending civil war. . . . Both parties deprecated war, but one of them would make war rather than let the nation survive, and the other would accept war rather than let it perish; and the war came. . . . Both read the same Bible, and pray to the same God, and each invokes His aid against the other. It may seem strange that any men should dare to ask a just God's assistance in wringing their bread from the sweat of other men's faces; but let us judge not, that we be not judged. The prayer of both could not be answered. That of neither has been answered fully. . . . With malice toward none, with charity for all, with firmness in the right as God gives us to see the right, let us finish the work we are in, to bind up the nation's wounds, to care for him who shall have borne the battle, and for his widow and his orphans, to do all which may achieve and cherish a just and a lasting peace among ourselves and with all nations."

The only change in the cabinet was the ap-

pointment of Hugh McCullough of Indiana as secretary of the treasury, in place of Mr. Fessenden, who had been elected to the senate. The confederates having attempted on March 3 to open peace negotiations with Gen. Grant, the president instructed him to have no conference with Gen. Lee unless it should be for the capitulation of Lee's army, or on some other purely military matter, and forbidding him to decide, discuss, or confer upon any political question. President Lincoln visited the army before Petersburg on March 24, and remained with it until the fall of Richmond, which he entered on the day after it was occupied, accompanied only by his son and Admiral Porter and a few sailors. He walked to the headquarters of Gen. Weitzel (in the house occupied two days before by Jefferson Davis), and on the way was rapidly surrounded by a throng of negroes shouting, crying, and calling down blessings on him. A few days later he revisited Richmond, but was suddenly recalled to Washington by an accident to Secretary Seward, who had been severely injured by being thrown from his carriage. On April 11, two days after Lee's surrender, he delivered a public address in which he discussed the question of reconstruction, intimating that he was undecided as to the best plan, but was anxious to have the seceded states restored to their proper relations with the general government as soon as possible, setting aside as immaterial any specific theory as to whether they had ever been out of the Union. Most of the blockaded ports were immediately opened by proclamation, all drafting, recruiting, and purchases of arms and supplies were stopped, and all military restrictions removed from trade.—President Lincoln had been frequently warned of the danger of assassination, as well as threatened with it in anonymous letters, but had never taken any precautions against it, believing on the one hand that it was not likely to be attempted, as the confederates could gain nothing by it, and on the other that if it were contemplated no precaution could protect one who must be so accessible to the people as the president of the United States. On the evening of Good Friday, April 14, he visited Ford's theatre, accompanied by Mrs. Lincoln and two or three personal friends. The play was "Our American Cousin." A few minutes past 10 o'clock an obscure actor, John Wilkes Booth, entered the box, having first barred the passage leading to it, approached the president from behind, placed a pistol close to his head, and fired. He then leaped from the front of the box upon the stage, brandishing a dagger, shouted "*Sic semper tyrannis!*" The south is avenged!" disappeared behind the scenes, passed out at the stage door, and escaped. (See BOOTH.) The president's head fell slightly forward, his eyes closed, and consciousness never returned. He was removed to a private house on the opposite side of the street, where he died at 22 minutes past 7 o'clock the next

morning. At the same hour when the president was shot, Secretary Seward was attacked in his house by a desperate assassin; and it became known that an elaborate plot had been formed for murdering simultaneously nearly all the chief civil officers of the government, and perhaps Gen. Grant also. The conspiracy had gradually grown out of a design to abduct the president, and was participated in to a greater or less extent by at least nine persons, eight of whom were tried by a military commission, and four of them (including a woman) were executed, while three were sentenced to hard labor on the Dry Tortugas for life, and one for six years; one died there, and the other three were pardoned by President Johnson. An investigation failed to show that the confederate government had any knowledge of the plot or was in any way directly responsible for it. It was an act of fanaticism which Mr. Seward had apprehended for two or three years, but which the simplicity of Lincoln's nature forbade him to contemplate.—Lincoln was the most remarkable product of the remarkable possibilities of American life. From the poverty in which he was born, through the rowdiness of a frontier town, the rudeness of frontier society, the discouragement of early bankruptcy, and the fluctuations of popular politics, he rose to the championship of union and freedom when the two seemed utterly inconsistent, never lost his faith when both seemed hopeless, and was suddenly snatched from life when both had been secured. He was a hater of slavery from the beginning, but was never an abolitionist until abolition became constitutional. At the head of the nation in a crisis when precedents were worthless and no man could forecast the future, his conduct was governed by the events of the day as they appealed to his love of justice and keen sense of the fitness of things, always guided by what has been called his "grand old wisdom of sincerity." He would ride 20 miles post haste to pardon a deserter, but on no account would he slacken the war against those who were in arms to divide the country. No feeling of jealousy ever prevented him from selecting the ablest men for the offices within his gift, and in his ministers of state, war, and finance he was singularly fortunate. Scores of his sayings have become proverbial, and when he spoke of the country as one "where every man has a right to be equal with every other man," he gave a new definition to the Declaration of Independence. The funeral honors paid to him have seldom been surpassed in grandeur, and perhaps never equalled in popular sorrow. The body was embalmed, and lay in state in the rotunda of the capitol on April 20, and on the 21st the funeral train started for Springfield, Illinois, by the same route he had traversed in first going to Washington. The remains lay in state in Baltimore, Harrisburg, Philadelphia, New York, Albany, Buffalo, Cleveland, Chicago, and Springfield,

and the interment took place at Oak Ridge cemetery, near Springfield, on May 4. On Oct. 15, 1874, the remains were removed to an elaborate tomb surmounted by a statue of Lincoln, an obelisk, and four symbolical figures.—See H. J. Raymond's "Life and Public Services of Abraham Lincoln, together with his State Papers" (New York, 1865); J. G. Holland's "Life of Abraham Lincoln" (Springfield, Mass., 1865); "The President's Words" (Boston, 1865); "The Lincoln Memorial" (New York, 1865); F. B. Carpenter's "Six Months at the White House" (New York, 1866); A. Boyd's "Memorial Lincoln Bibliography" (Albany, 1870); and W. H. Lamson's "Life of Abraham Lincoln" (vol. i., Boston, 1870).

**LINCOLN, Benjamin**, an American general, born in Hingham, Mass., Jan. 24, 1733, died there, May 9, 1810. Until the age of 40 he was a farmer, holding at different times the offices of magistrate, representative in the provincial legislature, and colonel of militia. He was also an active member of the provincial congresses of Massachusetts, and as a militia officer rose in 1776 to the rank of major general. In June of that year he commanded the expedition which cleared Boston harbor of British vessels. After the American defeat on Long Island he was despatched by the council of Massachusetts to reinforce Washington with a body of militia, and he subsequently participated in the battle of White Plains and other engagements. In the beginning of 1777 he joined Washington at Morristown with a new levy of militia, and soon after was transferred to the continental service with the rank of major general. After serving for several months in New Jersey, he was sent to join the forces assembled to oppose the progress of Burgoyne, and during the battle of Bemis's heights, commanded inside the American works. On the succeeding day, while reconnoitring in the vicinity of the enemy's position, he was severely wounded, and compelled for nearly a year to retire from service. In September, 1778, he was appointed to the command of the southern army, and for several months was engaged in protecting Charleston against the demonstrations of Gen. Prevost. Upon the arrival of Count d'Estaing he cooperated with the French troops and fleet in the unsuccessful assault on Savannah; and from the unwillingness of his allies to continue the siege he was obliged to return to Charleston, where in the spring of 1780 he was besieged by a superior British force under Sir Henry Clinton. After an obstinate defence he was forced in May to capitulate, and in November retired to Massachusetts on parole. In the spring of the succeeding year he was exchanged, and immediately joined Washington on the Hudson. He participated in the siege of Yorktown, and Washington appointed him to receive the sword of Cornwallis upon the surrender of the British forces. He held the office of secretary of war for three years from Octo-

ber, 1781, and then returned to his farm. In 1787 he commanded the forces which quelled the Shays rebellion in western Massachusetts, and in the same year he was elected lieutenant governor of the state. Upon the establishment of the federal government he received from Washington the appointment of collector of Boston, from which office he retired about two years before his death. He was a member of the commission which in 1789 formed a treaty with the Creek Indians, and of that which in 1793 unsuccessfully attempted to enter into negotiations with the Indians north of the Ohio. —See his life by Francis Bowen in Sparks's "American Biography" (2d series, vol. xiii.).

**LINCOLN, John Larkin**, an American scholar, born in Boston, Feb. 23, 1817. He graduated in 1836 at Brown university, where, after two years' residence at the Newton theological institution, he held the office of tutor in Latin for two years, and then passed several years in Europe in travel and literary studies. In 1844 he returned to the United States, and in the autumn of that year was appointed professor of Latin in Brown university. He has published "Selections from Livy" (1847; new ed., 1871), the "Works of Horace" (1851), and Cicero *De Senectute* (1872).

**LINCOLN, I. Levi**, an American statesman, born in Hingham, Mass., May 15, 1749, died in Worcester, April 14, 1820. He graduated at Harvard college in 1772, studied law at Northampton, was admitted to the bar in 1775, and commenced practice in Worcester. He was zealous in the cause of independence, was the author of numerous patriotic appeals, and between 1775 and 1781 was successively clerk of the court and judge of probate of Worcester county. In 1779 he was government commissioner for confiscated estates. He was a delegate to the convention in Cambridge for framing a state constitution, and in 1781 was elected to the continental congress, but declined to serve. In 1796 he was a member of the house of representatives, and in 1797 of the senate of Massachusetts. In 1800 he was elected to the national congress, and in 1801 was appointed attorney general of the United States; and he was provisional secretary of state during the few months preceding the arrival of Mr. Madison. At the end of Jefferson's first term (March, 1805) he resigned. In 1806 he was elected a member of the council of Massachusetts; in 1807 and 1808 he was lieutenant governor of the commonwealth; and after the decease of Gov. Sullivan in December, 1808, he was acting governor till the following May. In 1811 he was appointed by President Madison an associate justice of the supreme court of the United States, but declined on account of weakness of sight, which terminated in almost total blindness. A partial restoration of vision afterward enabled him to resume the cultivation of his farm and his classical studies. He was one of the original members of the American academy of

arts and sciences, sustained distinguished relations to other literary institutions, and from the close of the revolution was considered the head of the Massachusetts bar. **II. Levi**, eldest son of the preceding, born in Worcester, Mass., Oct. 25, 1782, died there, May 29, 1868. He graduated at Harvard college in 1802, began immediately to study law in the office of his father, then attorney general of the United States, was admitted to the bar in 1805, and practised in Worcester. Between 1812 and 1822 he was elected several times to both branches of the state legislature, and was speaker of the house in 1822. In 1814 he entered warmly into the debate in opposition to the Hartford convention, and drew up the protest against that body, which was signed by 75 other members of the legislature and was widely circulated. He was in 1820 a member of the convention called to revise the constitution of Massachusetts, was lieutenant governor of the state in 1823, and in 1824 was appointed judge of the supreme court. In 1825 he was selected by both the political parties as their candidate for governor of the state, and held the office till 1834. He is believed to have been the first governor under the constitution who exercised the veto power. He was a member of congress from 1835 to 1841, and collector of the port of Boston from 1841 to 1843. In 1844 and 1845 he was again a member of the state senate, of which body he was president in the latter year. He was presidential elector in 1848, when he presided over the electoral college; and upon the organization of his native town as a city he became its first mayor. He was an active member of the American antiquarian society, of the American academy of arts and sciences, and of the Massachusetts historical society. **III. Enoch**, brother of the preceding, born in Worcester, Mass., Dec. 28, 1788, died in Augusta, Me., Oct. 8, 1829. He entered Harvard college in 1806, subsequently received the degree of master of arts from Bowdoin college, studied law with his brother Levi at Worcester, and was admitted to the bar in 1811. He began practice in Salem, but removed in 1812 to Fryeburg in Maine. He settled in the neighboring shire town of Paris in 1819, and represented the district of Oxford in congress from 1819 to 1826. In 1827 he was elected governor of Maine, and was twice reelected with hardly any opposition. He wrote "The Village," a poem descriptive of the scenery and romance of Maine (1816), and valuable papers in the first volume of the "Maine Historical Collections." He also left in manuscript an unfinished work on the history, resources, and policy of Maine.

**LINCOLNSHIRE**, an E. county of England, bounded N. by the Humber and its estuary, E. by the North sea, S. by the counties of Cambridge, Northampton, and Rutland, and W. by Leicester, Nottingham, and York; area, 2,762 sq. m.; pop. in 1871, 436,599. Much of the surface is flat and low, a large portion



lying below the level of the sea, from which it is protected by embankments. Since the Roman occupation vast tracts of this fenny district have been from time to time reclaimed from the sea, and constitute some of the most productive land in Great Britain. (See BEDFORD LEVEL.) The principal rivers are the Trent, Witham, Welland, and Ancholme. The soil of the fens consists chiefly of a deep loam, clay, and peat; elsewhere it is generally a rich sandy loam. The county is celebrated for the high condition of its agriculture, and for its fine breeds of cattle, horses, and sheep, as well as for the number and beauty of its ancient parish churches. Capital, Lincoln.

**LIND (Goldschmidt), Jenny**, a Swedish vocalist, born in Stockholm, Oct. 6, 1821. From infancy she manifested a remarkable talent for singing. When about nine years old she entered the musical academy at Stockholm, where she made such progress that at the end of a year she was deemed fitted for the stage, on which she soon made her appearance in juvenile parts, showing dramatic talents not less remarkable than her vocal accomplishments. For two years she performed to the delight of Stockholm audiences, when the upper notes of her voice became clouded and harsh, and the idea of preparing her for the grand opera was abandoned. For four years she remained in obscurity, forbidden to exercise her voice, and finding her chief enjoyment in studying instrumental music. When she was about 16 years of age accident brought her upon the stage one night, temporarily to assume an unimportant part in one of Meyerbeer's operas, and she discovered that her voice had returned to her with more than its former purity and power. The next day she was invited by the manager of the opera to assume the part of Agatha in Weber's *Freischütz*, and for nearly two years she was the reigning prima donna of the Stockholm opera. Feeling, however, that her voice was not under sufficient control, she went in 1841 to Paris, and put herself under the instruction of Garcia, then the first singing master in Europe. He gave her little encouragement; but about a year after her arrival in Paris she was introduced to Meyerbeer, in whom she found an appreciative admirer of her talents, and from whom she subsequently received an invitation to sing in the opera at Berlin. She made her reappearance upon the stage in her native city, and in 1844 first sang before a Berlin audience at the opening of the opera house, as Vielka in Meyerbeer's *Feldlager in Schlessen*. Thenceforth her reputation increased with every performance, and in Vienna and other musical cities she was received with great enthusiasm. In May, 1847, she made her début before a London audience as Alice in the opera of *Robert le diable*, and excited a sensation almost without a parallel in the history of the opera in England. During this season she also appeared as Marie in *La fille du régiment*, Amina in *La sonnambula*, Norma

in the opera of that name, and Agatha in *Der Freischütz*. For the next three years she appeared repeatedly in England, Germany, and Sweden, adding meanwhile to her parts those of Lucia di Lammermoor, Adina in *L'Elisir d'amore*, Susanna in the *Nozze di Figaro*, and Elvira in *I Puritani*, and showing her versatile powers in oratorios and miscellaneous concert music. In September, 1850, she came to America, under an engagement with P. T. Barnum to give a series of 150 concerts. Her first concert in New York excited the wildest enthusiasm. The tickets were put up at auction, a hatter paid several hundreds of dollars for the choice of the best seat, and large sums were given for other desirable places. Her share in the proceeds of this concert, amounting to about \$10,000, was bestowed upon local charities. A like excitement attended her appearance in other cities; but in June, 1851, availing herself of an article in the agreement, she terminated the engagement after the 95th concert, and gave thereafter a series of concerts on her own account. During her stay in Boston she was married to Otto Goldschmidt, a young pianist who had accompanied her on a part of her American tour. Returning with him to Europe, she resided for a while at Dresden, and in 1858 removed to London. She refused to reappear upon the stage, but gave several concerts for the benefit of the poor, in London and elsewhere, one of the latest being given at Cannes, France, in 1866. Her voice, a soprano, embracing a register of 2½ octaves, was not less remarkable for sweetness and purity of tone than for its sympathetic power. Her execution was equally remarkable, and in the interpretation of many varieties of music, from the oratorios of Handel to the rondos of Rossini or Donizetti, or simple national ballads, she was without a rival.

**LINDAU**, a town of Bavaria, on two islands in the lake of Constance, 25 m. E. S. E. of Constance; pop. about 5,000. It has a royal castle, four churches, a Latin school, a commercial and industrial school, and an important trade, chiefly in wine, corn, cheese, and fish. The port, called Maximilianshafen, was established in 1812, and subsequently considerably enlarged. Near it is a statue of King Maximilian II., erected in 1856. Lindau was till 1803 a free imperial city.

**LINDE, Samuel Bogumil**, a Polish philologist, born in Thorn in 1771, died in Warsaw, Aug. 8, 1847. He was of Swedish extraction, studied at Leipsic, took part in the revolutionary war under Kosciuszko, lived for some time in Vienna, and in 1803 established himself in Warsaw. He became rector of the gymnasium and librarian of the university, retiring into private life in 1838. His fame rests on his "Dictionary of the Polish Language" (6 vols., Warsaw, 1807-'14; new ed., 1855-'9).

**LINDEN**, the name in all Germanic languages for trees of the genus *Tilia*, its origin being obscure; the same trees are called lime, and

by the old English authors lyne or line; they are called in northern Europe bast trees, and in the United States linden, lime, and basswood. The botanical name *tilia* is the ancient Latin one; the genus is the typical one of a large family, the *tiliaceae*, which in the latest



Linden—Leaf, Flower, and Fruit.

revision of genera (Bentham and Hooker) is made to include some 40 genera, almost all of which except *tilia* are natives of tropical or sub-tropical countries, and are with few exceptions trees or shrubs. The genus *tilia* consists wholly of trees with large, alternate leaves, which are more or less heart-shaped, and oblique or truncate at the base; deciduous stipules, and flowers in cymes, the peduncle to which is united to a conspicuous leaf-like bract. The flowers have five sepals, and as many petals; the stamens are numerous, and in the European species cohere in five clusters, but in our species they are attached to the base of a petal-like body which stands before each of the proper petals; the pistil has a five-celled ovary, a single style, and a five-toothed stigma; the fruit is a globular, woody nut, which is by abortion one-celled, and one- to two-seeded. The flowers are cream-colored and very fragrant, and as they secrete a large amount of honey the tree is a favorite with bee-keepers both in Europe and America. The amount of honey reported as collected in some apiaries in our western states, situated near basswood forests, seems almost fabulous; honey from this source is highly prized, and the renowned Lithuanian honey owes its excellence to the linden. The wood of the lindens is light, white, close-grained, and tough, and is well adapted to the uses of the carver and turner; wooden bowls, boxes, &c., are made from it, and it is used in carving figure-heads for vessels and other images, to make toys and other small carved wares, as well as for interior decorations, notable examples of which are at Windsor castle and Trinity college, Cambridge; besides these uses, it is employed for the curved portions of staircases, the sounding-boards of pianos, the seats of chairs, and for various other purposes requiring a light wood that will not warp. The inner bark of the trees, known as bast or bass

bark, is of quite as much importance as the wood; it is composed of long tough cells, which have given the name of bast to the tissue in whatever plant it may occur. (See BAST.) The great supply of commerce comes from Russia, and as it is exported in the form of mats, it is known as Russia matting or bast mats; these mats are much used for packing furniture and other merchandise; they are a coarsely woven fabric of twisted strands of the inner bark of the linden, and are from 1½ to 2 yards square; a few years ago there were annually exported to England alone 14,000,000 of these mats. Bast matting is an important accessory in gardening, as strips from it are largely used for tying up plants, and it affords a tying material used in budding for which it is not easy to find a substitute. Bast from the American linden is now sold in the stores, and if properly selected is quite as good as the foreign. The bast of commerce is obtained from comparatively young trees; the bark is stripped whenever it will peel freely, and is thrown into water; after a few days' steeping the layers of the bark will readily separate, when they are pulled apart and hung up to dry; the innermost or youngest layers are of such delicate texture that they are of but little use, while the outer ones are tough but harsh; the layers are consequently assorted for different uses. From this bark the Russians make the mats of commerce, coarse cloth, fishing nets, baskets, ropes, and even the upper part of peasants' shoes.—The American linden (*T. Americana*) is found over a wide range north and south; its leaves, which vary considerably,



American Linden (*Tilia Americana*).

are smooth or nearly so; it forms a fine shade tree for ornamental grounds and avenues; its outline is pleasing, its foliage dense, and it resists our hot summers better than the European; the variety *pubescens*, regarded by some as a distinct species, has its leaves pubescent

below. The white linden, *T. heterophylla*, is more common in the southwest; it has larger leaves, covered with a silvery down underneath, which gives a pleasing appearance to the tree as its foliage is moved by the wind. The European linden, as has already been mentioned, differs from the American species in the arrangement of its stamens; it is *T. Europæa*, and is known in nearly a dozen varieties; the normal form has much smaller leaves and its foliage is more dense than in our lindens; some years ago it was largely planted as a street tree in our eastern cities, in imitation of European custom, but it proved so susceptible to the attacks of insects, and ripened its foliage so early, that it is now less popular than formerly. There are red-twigged, fern-leaved, and other varieties, all of which are interesting in a large collection. The lindens are easily multiplied by seed, but the nurserymen resort to the more rapid process of mound layering. (See LAYERING.)

**LINDLEY, John**, an English botanist, born at Catton, near Norwich, Feb. 5, 1799, died near London, Nov. 1, 1865. His father cultivated a large nursery garden in Catton. At an early age the son published a variety of papers and monographs on botanical subjects. About 1821 he settled in London, where for many years he was employed in writing the descriptive portion of Loudon's "Encyclopædia of Plants," published in 1829. While engaged upon this work, the arrangement of which was according to the artificial system of Linnæus, he became a decided convert to the natural arrangement, and in 1830 published his "Introduction to the Natural System of Botany." This was followed in 1832 by his "Introduction to Systematic and Physiological Botany," and "Synopsis of the British Flora," and in 1833 by his *Nævus Plantarum*, in which he undertook to reduce the natural orders into groups subordinate to the higher divisions. In 1846 appeared his "Vegetable Kingdom," an expansion of a work previously published under the title of "A Natural System of Botany," which in its turn was remodelled from the "Introduction to the Natural System of Botany." The "Vegetable Kingdom" was at the time the most comprehensive work on the structure and uses of known plants yet published. Previous to the appearance of this work he published *Flora Medica* (8vo, 1838), in which full descriptions of the plants used in medical practice are given; and in conjunction with Mr. Hutton "The Fossil Flora of Great Britain," which was commenced in 1831, and published in parts. He was also the author of a number of popular treatises on botany, including "Ladies' Botany," in a series of letters, "School Botany and Vegetable Physiology," &c. The practical aim of his studies is evinced in his "Theory and Practice of Horticulture," "Orchard and Kitchen Garden," and contributions to the "Gardener's Chronicle," a weekly journal, of which he was the editor

from 1841 till the time of his death. The last work upon which he was engaged is the "Treasury of Botany," a valuable popular botanical dictionary, which was completed by Dr. M. T. Masters and his associates. He filled the chair of botany in University college, London, and lectured on his favorite science at the royal institution, and at the botanic gardens, Chelsea. He had entire charge of the colonial department of the international exhibition of 1862, and his great exertions prostrated him both mentally and physically. He was a fellow of the royal society.

**LINDPAINTNER, Peter Joseph von**, a German composer, born in Coblenz, Dec. 8, 1791, died at Nonnenhorn on Lake Constance, Aug. 21, 1856. He was for many years leader of the orchestra of Stuttgart, which by his efforts became one of the best in Germany. Among his principal works are the operas of "The Sicilian Vespers" and "The Vampire."

**LINDSAY**, a town and the capital of Victoria co., Ontario, Canada, situated on the river Seugog, on the Midland railway, 56 m. N. E. of Toronto; pop. in 1871, 4,049. It has an extensive trade in lumber and grain, and contains flour and saw mills, a brewery, and manufactories of iron castings, machinery, leather, woollens, wooden ware, extract of bark, boots and shoes, &c. There are three branch banks, several hotels, and two weekly newspapers.

**LINDSAY, Alexander William Crawford**, earl of Crawford and Balcarres, a British author, born Oct. 16, 1812. He graduated at Trinity college, Cambridge, in 1833. Having made an extensive tour in the East, he published "Letters from Egypt, Edom, and the Holy Land" (1838; 5th ed., with additional notes, 1858). Besides several pamphlets and minor works, he has also published "Sketches of the History of Christian Art" (3 vols., 1847); "The Lives of the Lindsays," a family history (3 vols., 1849); "Œcumenicity in relation to the Church of England" (1870); and "Etruscan Inscriptions analyzed, translated, and commented upon" (1872). He succeeded his father in the peerage Dec. 15, 1869, previously to which he was known as Lord Lindsay.

**LINDSAY, or Lyndsay, Sir David**, a Scottish poet, born at Garmlyton, Haddingtonshire, about 1490, died about 1555 or 1567. He inherited the estate of "The Mount" in Fifeshire, and is commonly called Sir David Lindsay of the Mount. In 1512 he was appointed servitor to the prince, afterward James V. He was sent upon various embassies, and in 1548 negotiated free trade in grain with Denmark. He early became distinguished for his literary and poetical ability, incurred the hatred of the clergy by his satires, was in 1547 one of those who urged Knox to receive ordination, and his name was long popular as a Protestant champion. His principal poems are "The Dreame," "Testament and Complaynt of our Sovereane Lordes Papingo," "Complaynt of John the Commonweil," "Historie of Squyer

Meldrum," "The Monarchie," and "Satyre on the Thrie Estaitis," a play directly attacking the clergy, constructed on the principle of the mysteries or miracle plays of an earlier age. Many of his productions are indecent and severely satirical. His works, with a life, introduction, and glossary by George Chalmers, were published in London in 1806, in 3 vols.

**LINDSEY, Theophilus**, an English theologian, born at Middlewich, Cheshire, June 20, 1723, died in London, Nov. 3, 1808. He was educated at St. John's college, Cambridge, received orders, and held various preferments. In 1769 he formed an intimacy with Dr. Priestley, then Unitarian minister at Leeds, the result of which, combined with doubts which he had long previously entertained, was that Lindsey surrendered his living in 1773, and made public profession of Unitarianism. He then went to London, and in April, 1774, began to officiate as a Unitarian minister in a room in Essex street. After four years his congregation erected a chapel for him, where he continued till age and failing health compelled him to resign in 1793. Among his writings are an apology for his abandonment of Anglicanism, and several controversial and historical works on Unitarianism. A memoir of his life, with extracts from his works, by the Rev. Thomas Belsham, was published in London in 1812.

**LINEN** (Gr. *λίνον*, Lat. *linum*, flax, linen), a fabric made of flaxen threads. The manufacture is very ancient, and no record is preserved of its early history. It was old in the time of Herodotus; and in his day linen was exported from Egypt to the ports of the Mediterranean. The ancient Egyptians, celebrated for their textile products, not only consumed the fabric largely for their own uses, but supplied it to foreign markets. Its use was particularly connected with their religious and funeral services. The priests were forbidden to enter the temples robed in other than linen garments, and the dead were always shrouded in this material. It has indeed been questioned whether the bandages of the mummies are not of cotton; but microscopical examinations show that the threads have the jointed cylindrical form of the flaxen fibre, and not the flat and spirally twisted shape of the fibre of cotton. The inner wrappings of the mummies are of coarse texture, but the outer are much finer. Some of the work of the rude looms of the ancient Egyptians was extremely delicate; and it is probable that the "fine linen" mentioned in Scripture would compare favorably with that produced by the most perfect machines of the present time. In the British museum are specimens of mummy cloths thin and transparent like the muslins of India. Some of these even contain 270 threads to an inch in the warp, and 110 in the woof, while the finest work of the Decca looms has only 100 threads to an inch in the warp and 84 in the woof. In all the Egyptian linens the number of threads in the warp is much greater than of

those in the woof, owing to the difficulty of working in the latter when the shuttle was thrown by hand. The coarser fibres of the flax appear to have been employed by the Egyptians for nets, ropes, and sail cloths. The Greeks obtained linen from Egypt, and adopted for it the name of *ὀβόνη* applied in that country to fine linen, as also the more general term *σινδών*; but as the cotton of India came to be also introduced into Greece, the names appear to have been applied to this product also; and finally the term *βύσσος*, byssus, supposed to be of similar origin and to designate the plant which produced the linen, came to be used with the same ambiguity. But this last word, of frequent occurrence in the Greek classics, is most commonly applicable, it is supposed, to fabrics of linen rather than to those of cotton. So Josephus used it in speaking of the garments worn by the Jewish priests; and several of the early fathers speak of byssus as an Egyptian plant, while cotton is known to have been chiefly of Indian growth. In both the Old and New Testaments the use of linen garments, by the priests particularly, is often alluded to; and the fibre, we are told, was applied to the manufacture of cords, lamp wicks, and measuring lines. From this last use of the material, *linum*, comes the word *linea*, line, as explained by Isidorus of Seville: *Linea genere suo appellata, quia ex lino fit*. Linen was in high repute among the more wealthy Romans, and it is recorded in the life of Alexander Severus, by *Ælius Lampridius*, that this emperor preferred that which was plain to such as was interwoven with flowers, feathers, and gold; and the emperor Carinus is said to have extolled in high terms the linen cloths brought from Egypt, and those from Tyre and Sidon, transparent from their thinness, glowing with purple, and most precious for the perfection of their embroidered work. Pliny refers to the production of flax in Spain and other parts of Europe, and says that in all parts of Gaul it was woven into sail cloth, and that in some of the countries beyond the Rhine the most beautiful apparel of the women was linen. For the culture of the plant, and its preparation for spinning, see **FLAX**.—It was not until the machine processes of spinning and weaving cotton had been for some time in successful operation, that similar improvements were applied to the manufacture of linen. The spinning wheel and hand loom were employed throughout the linen districts of Europe even into the present century, affording to the females of every family a most useful and genial occupation. In the quality of the fabrics the highest excellence was attained by the French and Flemings, and among commercial products the linen of Flanders and the north of Europe long maintained a high rank. Ireland, too, was celebrated for the general diffusion of the manufacture, especially among the families of the province of Ulster, and the heavy linens of that country, in the form of table cloths and sheeting, have long held an

important place in the general trade in this fabric. The first mills in England for spinning flax were erected in Darlington near the close of the last century, upon plans the invention of which is claimed by the French, though afterward, as they admit, greatly perfected by the English. Other mills were soon established, and the British manufacture at last became more extensive than that of other nations. It attained the greatest prosperity in Ireland, where the manufacture is more generally carried on than in any other country, owing, as it is asserted, to its climate being best adapted for successful bleaching of linen, a process much more difficult and tedious than that of bleaching cotton, conducted very much in the open air, and dependent in great measure upon the condition of the atmosphere. The machine processes of weaving and spinning are not very different from those for cotton already described. To make the slivers into yarn for thread, the tin cans containing them are brought to a drawing or spreading frame, and several slivers are united into one and drawn out, a process which may be several times repeated, as in the preparation of the cotton yarns. The drawings are then slightly twisted upon a roving frame, and wound upon bobbins to be ready for spinning. For the finer fabrics it is found necessary to increase the pliability of the fibres by keeping them moist. This is effected by means of a trough of warm water, which is arranged along the spinning frame, so that the spindle by its rapid motion shall cause a fine spray to be constantly thrown up from the surface of the water. The yarns thus prepared do not equal in fineness some of those made by hand. They are rated at so many "leas" of 300 yards each to the pound; in 1839 a common maximum was 150 to the pound, but they are now spun of 200 to 240 leas. Such yarn is employed for Irish lawns and coarse cambrics. The finer fabrics of cambrics and valenciennes require handspun yarns. The yarns are assorted into bundles, which are made up each one of 20 hanks of 10 leas each, and their quality is indicated either by naming the number of leas to the pound, or the direct weight of the bundle itself, an eight-pound bundle being one of 25 leas to the pound, and a two-pound bundle one of 100 leas to the pound. To make linen thread, the yarns are doubled, and after bleaching the thread is wound into balls or upon spools.—In former times the sale of brown manufactured linens was conducted in the Irish market towns (especially in Ulster) in halls set apart for the purpose; and in Armagh, Ballymena, Coleraine, Ballymoney, and Lurgan the practice is still continued. These sales, however, are only of hand-loom goods, the power-loom productions being sold direct to the merchants. The great business in these is conducted by private contracts, and through the agency of commission houses in Belfast; and to such an extent has it increased, that a single

establishment now makes little of furnishing 2,000 or 3,000 pieces of linen a week, when 70 years ago such an amount would have served the largest works for a whole year. The prices are said to be very difficult to quote, owing to the great variety of "sets" representing the fineness and the variety in the yarns used for the "set." Each large firm has its own standard of rates. The brown linens when purchased are chiefly sent to the bleach greens, where they are boiled in a lye of soda ash, and then spread to dry for two or three days upon the grass. These processes may be repeated several times until the goods are half white. (See BLEACHING.) The straw of the flax, which cannot be perfectly extracted in the scutching and cleaning, now shows itself more plainly. To remove this the goods are soaked in a bath of water containing an alkaline chloride, as of soda, and are treated, either after or before this, with dilute sulphuric acid of 2° or 3° Twaddell. The "rubbing" succeeds, which is a thorough washing by machinery, with the use of plenty of soap. When the linen is quite white it is starched, and afterward dried on steam-heated rollers. It is then ready for the "finishing" process, which is effected by machines called "beetles," or by the patent method of spreading the linens on frames in a stove house, and, while they are gently stretched and carefully handled upon these, exposing them to a current of air which is made to pass continually over them. A finish is thus obtained like that of linen pocket handkerchiefs. The whole time required for bleaching is from four to seven weeks, according to the season and the weight of the fabric. The extreme whiteness given to some linens is often at the expense of their strength, the material being partially worn out in the operation. A fair, even shade, attainable by all intelligent bleachers, ought to suffice if it be desirable to produce the best quality of goods. Linens that are not to be bleached are either finished brown, or are colored before finishing; and some are partly bleached and dyed. Many goods have lately been first bleached and then printed with fancy patterns. The chief kinds of manufactured linen are lawn, cambric, damask, diaper, sheeting, and towelling.—The countries in which the manufacture of linen is most extensively carried on are France, Belgium, and Great Britain. The principal seats of the manufacture in Great Britain are in and near the West riding of Yorkshire, in Lancashire, Dorsetshire, Durham, and Shropshire, in Dundee in Scotland, and Belfast in Ireland. The manufacture of linen was introduced into the United States by the establishment of a large mill in 1834 at Fall River, Mass.; but the industry has not increased to very great extent, most of the linen goods consumed in the United States being imported. The extent of the linen manufacture in Great Britain is indicated by the following statement of the number of factories employed in spinning and weaving flax in 1871:



	England.	Scotland.	Ireland.	Total.
Factories employed in spinning only...	72	76	65	213
Factories employed in weaving.....	88	88	48	174
Factories employed in spinning and weaving.....	25	24	21	70
Factories not specified.....	20	8	20	48
Whole number of flax factories...	155	191	154	500
Number of spinning spindles.....	869,768	817,085	866,482	1,553,335
Operatives emp'd..	19,816	49,917	55,089	124,772

Of the operatives, 86,776 were females. There were 1,689 carding machines, 398 combing machines, 67,212 doubling spindles, 35,301 power looms, and 21,861 power-loom weavers. Although there were more establishments in England and in Scotland than in Ireland, those of the latter country were more extensive, and had a greater number of spindles and of employees. The export of linen manufactures from the United Kingdom has increased from £3,852,341 in 1861 to £7,306,153 in 1873. The exports in 1873 embraced white or plain linen to the value of £6,204,800; printed, checked, or dyed, £260,639; sail cloth and sails, £263,276; other kinds, £577,438. Besides the above, the exports of linen yarn amounted to 27,981,042 lbs., valued at £1,622,216, in 1861, and 28,734,212 lbs., valued at £1,976,830, in 1873. The greater portion of the manufactured linen is sent to the United States, while Spain, Holland, and Germany receive the largest amounts of the yarn exported. In the United States in 1870, besides the establishments for dressing flax (see FLAX), there were 10 manufactories of flax and linen goods, the products of which during the year were valued at \$2,173,775. The capital invested amounted to \$2,325,250. The imports into the United States during the year ending June 30, 1873, of the manufactures of flax (including some articles of jute and hemp) amounted to \$20,428,391, nearly all of which was from Great Britain. Jute is now much used with flax to produce the coarser linens.

**LING**, a European fish of the cod family, *Lota molva* (Cuv.). The body is elongated, the head flat, the gape large, the lower jaw the shorter with a single barbule at the extremity; teeth



Ling (*Lota molva*).

in the upper jaw small and very numerous, a single larger and longer row below; scales small and firmly adherent; the dorsal fins of equal height, the first short but not pointed as in the hake, the second long, immediately behind the first, reaching nearly to the caudal,

and most elevated posteriorly; anal nearly co-extensive with the dorsal, and caudal rounded. The back and sides are gray, inclining to olive; the belly silvery; ventrals white, and dorsal and anal edged with the same; caudal marked near the end with a transverse black bar, and the extreme tip white. This is a very valuable species, and is caught in great numbers on the English and Irish coasts by hand and long lines; it is consumed fresh and salted, and is largely exported to southern Europe, forming an article of commerce almost as valuable as codfish; the sounds, roes, and oil from the livers are valuable, the latter for use in lamps and as an internal medicine in rheumatism. It is very prolific and voracious, feeding on any living thing coming in its way. The best time for the fishery is between January and August, and the favorite resorts are the margins of rocky valleys in the ocean; it bites eagerly, and is readily caught. The usual length is about 3 or 4 ft.—Another species of *Lota*, inhabiting the lakes and rivers of America from northern New York to the arctic regions, the *L. maculosa* (Lesueur), the codfish of the lakes or eel pout, is sometimes called ling in northern New England. The eel-shaped blenny (*Zoarces anguillarum*, Peck), of the goby family, is also called ling by the Massachusetts fishermen. Other European gadoids of the genus *motella*, with a slightly elevated and delicate first dorsal, with a barbel on the chin and two or four on the upper jaw, are called rock ling; they frequent rocky ground well supplied with seaweed; though readily taking the bait, they are not much esteemed as food unless eaten very soon after they are caught; the length varies from 10 to 15 in.; the food consists of small fishes and thin-shelled crustacea.

**LING, Peter Henrik**, a Swedish poet, the founder of curative gymnastics, born in Ljunga, Smaland, Nov. 15, 1776, died in Stockholm, May 3, 1839. He was educated at the schools of Wexjö, and in 1797 passed the theological examination. From this time he travelled over Europe, apparently with no definite object, often reduced to extreme want, yet maintaining a sturdy independence of character. His love of adventure at one time led him to take part in a sea fight against Nelson. He at last returned to Sweden, having acquired several modern languages besides a variety of other knowledge. While at Stockholm suffering from an attack of gout in the elbow, he conceived the idea of curing the complaint by exercise, and with this object learned the art of fencing. His success in this experiment led him to believe that many other diseases might also be relieved or cured by suitable combinations of movements, such as would induce the proper physiological action in the part exercised. Such was the origin of the so-called kinesipathy or movement cure, on the establishment of which his reputation is chiefly based. This system is now recognized as a medical auxiliary, applicable especially to chronic dis-

eases and cases of deformity, and is practised to some extent in Europe and America. Ling became a proficient in anatomy and physiology, and perfected several other branches of gymnastics. He at first supported himself by teaching the modern languages and fencing, and in 1805 he was appointed professor of fencing in the university at Lund. He also lectured on the old Norse poetry, history, and mythology, and wrote dramas and many poetical essays, some of which have great beauty. He still devoted himself assiduously to the study of the curative effects of certain bodily movements; and on being appointed master of fencing in the military academy at Carlberg, he was enabled to put his ideas into practical execution, after having long struggled against the indifference of others and his own poverty. In 1813 the royal central institution was established at Stockholm to be devoted to his special practice, and he was made the director. He was elected member of the Swedish academy, and was appointed professor and knight of the order of the north star. His "Elementary Principles of Gymnastics" was published after his death (Upsal, 1840). Several other works have since been written in exposition of his theories, both in German and English.

**LINGARD, John**, an English historian, born in Winchester, Feb. 5, 1771, died at Hornby, near Lancaster, July 13, 1851. His parents were Roman Catholics, and in humble circumstances. The friendship of Bishop Talbot enabled him to be sent at a very early age to the English college at Douai, where he entered the theological department in 1791. During the disturbances of the French revolution he once narrowly escaped being hanged by a mob, and soon afterward, anticipating the forcible dissolution of the college, which took place a little later, withdrew with some others of the community to England, where they formed a seminary at Crook Hall, near Durham. He was ordained priest in May, 1795, and was appointed about the same time vice president of the seminary and professor of natural and moral philosophy. In 1808 the community removed to Ushaw near Durham, where Lingard remained three years, having previously refused the presidency of the college of Maynooth. In 1811 he accepted the charge of a small mission at Hornby for the purpose of pursuing his studies with less interruption, and prosecuting the design which he had already formed of writing a history of England. In 1817 he went to Rome upon an important mission, and again in 1825, when a cardinalship was offered to him, which he declined. During his later years he received a pension of £300 from the British government. His principal work is the "History of England, from the First Invasion by the Romans to the Accession of William and Mary, in 1688." The first portion appeared in 1819, and it was finally completed in 8 vols. 4to in 1830. In 1849 was published an edition in 10 vols. 8vo, thor-

oughly revised by the author. The work has been translated into several languages, and ranks among the standard histories of England. Among Lingard's other writings are: "Antiquities of the Anglo-Saxon Church" (1806; enlarged ed., 1845); "Documents to ascertain the Sentiments of British Catholics in former Ages in regard to the Power of the Popes" (1812); "A Review of certain Anti-Catholic Publications" (1813); "Strictures on Dr. Marsh's Comparative View of the Churches of England and Rome" (1815); "New Version of the Four Gospels" (1836); "Account of the Martyrs" (1839); and "Catechetical Instructions on the Doctrines and Worship of the Catholic Church" (1840).

**LINGULA.** See BRACHIOPODA.

**LINKÖPING,** a town of Sweden, capital of the län of the same name, or Östergothland, 108 m. S. W. of Stockholm; pop. in 1869, 7,154. It is the seat of the governor of the län and of a bishop, has a gymnasium with a library of 30,000 volumes and valuable collections of coins and antiquities, three churches, a castle, and considerable trade and industry. Several Swedish diets were held here.

**LINLEY. I. Thomas**, an English composer, born at Wells about 1725, died in London in 1795. After completing his musical education he established himself in Bath, where he was very successful in teaching and giving concerts. His two elder daughters, afterward Mrs. Sheridan and Mrs. Tickell, added greatly to the attractions of his concerts as singers. On the retirement of Christopher Smith, who had been Handel's amanuensis, he removed to London to take the management of the oratorios, first in conjunction with Stanley the blind composer, and afterward with Dr. Arnold. In 1775 he set to music the opera "The Duenna," by his son-in-law Richard Brinsley Sheridan; its unparalleled success induced him to join the latter in purchasing an interest in Drury Lane theatre, the musical department of which he conducted for many years. He was the author of 12 ballads and a madrigal which are considered among the finest specimens of their class. His death was hastened by grief at the loss of his eldest son, Thomas, a musician of great promise and an intimate friend of Mozart. **II. William**, youngest son of the preceding, also a composer, born about 1767, died in 1835. He was for many years in the East India company's service, and having accumulated a handsome competency, he devoted the remainder of his life to literary pursuits and music. He was the author of numerous glees, canzonets, and miscellaneous pieces, distinguished by grace and feeling, and compiled "The Dramatic Songs of Shakespeare" (2 vols. fol.), in which are several of his own compositions. He also wrote two comic operas and several novels.

**LINLITHGOW,** a town and royal and parliamentary burgh of Scotland, capital of Linlithgowshire, on Linlithgow loch, and on the Union canal and the Edinburgh and Glasgow

railway, 17 m. W. by N. of Edinburgh; pop. in 1871, 3,689. It was a place of much importance as early as the beginning of the 12th century, and contains the ruins of a splendid palace, the nucleus of which was built by Edward I. of England, and in which Mary queen



Ruins of Linlithgow Palace.

of Scots was born; it was burned by Hawley's dragoons in 1746. There is also an ancient church, founded by David I., and now considered one of the most perfect specimens of Gothic architecture in Scotland.

**LINLITHGOWSHIRE**, or *West Lothian*, an E. county of Scotland, bordering on the frith of Forth and the counties of Edinburgh, Lanark, and Stirling; area, 126 sq. m.; pop. in 1871, 41,191. The coast is low and the waters shoal; but there are small harbors at Queensferry, Borrowstounness, Newhalls, and Port Edgar. In the south are extensive heaths and mosses, and elsewhere the surface is varied with knolls and undulations. The principal rivers are the Almond and Avon. Coal, limestone, freestone, and granite are plentiful, and there are iron works at Borrowstounness. Agriculture is in an advanced state, but there are few manufactures. The principal towns are Linlithgow, Queensferry, Bathgate, and Borrowstounness.

**LINN**. **I.** An E. county of Iowa, drained by the Wapsipinicon and Red Cedar rivers and Prairie and Buffalo creeks; area, 720 sq. m.; pop. in 1870, 31,080. It is well timbered, and has a diversified surface and an excellent soil. The Dubuque Southwestern, the Chicago and Northwestern, and the Burlington, Cedar Rapids, and Minnesota railroads pass through it. The chief productions in 1870 were 707,868 bushels of wheat, 2,261,647 of Indian corn, 792,119 of oats, 157,851 of potatoes, 49,921 lbs. of wool, 893,190 of butter, and 51,207 tons of hay. There were 11,465 horses, 10,887 milch cows, 18,968 other cattle, 15,680 sheep,

and 40,248 swine; 12 manufactories of carriages, 9 of brick, 3 of cooperage, 9 of furniture, 2 of lime, 1 of linseed oil, 1 of paper, 10 of saddlery and harness, 7 of tin, copper, and sheet-iron ware, 3 of woollen goods, 5 breweries, 9 flour mills, 7 saw mills, and 1 railroad repair shop. Capital, Marion.

**II.** An E. county of Kansas, bordering on Missouri, and intersected by the Osage river; area, 600 sq. m.; pop. in 1870, 12,174. The surface is mostly occupied by prairies, with groves along the streams; the soil is fertile. Coal and building stone are abundant. The Missouri River, Fort Scott, and Gulf railroad traverses it. The chief productions in 1870 were 116,701 bushels of wheat, 728,814 of Indian corn, 300,880 of oats, 80,683 of potatoes, 25,544 lbs. of wool, 233,214 of butter, and 7,133 tons of hay. There were 5,362 horses, 4,955 milch cows,

7,386 other cattle, 8,483 sheep, and 9,432 swine; 4 manufactories of saddlery and harness, 4 of tin, copper, and sheet-iron ware, 3 flour mills, and 6 saw mills. Capital, La Cygne.

**III.** A N. county of Missouri, drained by Locust and other creeks; area, 588 sq. m.; pop. in 1870, 15,900, of whom 742 were colored. It has a rolling surface and a fertile soil. The Hannibal and St. Joseph railroad passes through it. The chief productions in 1870 were 103,711 bushels of wheat, 472,135 of Indian corn, 228,473 of oats, 52,853 of potatoes, 58,255 lbs. of tobacco, 43,697 of wool, 179,263 of butter, and 7,686 tons of hay. There were 5,662 horses, 4,602 milch cows, 7,909 other cattle, 17,192 sheep, and 20,632 swine; 6 manufactories of carriages, 7 of saddlery and harness, 2 flour mills, and 4 saw mills. Capital, Linneus.

**IV.** A W. county of Oregon, bounded W. by Willamette river and drained by the Santyam and Calapooya; area, 2,400 sq. m.; pop. in 1870, 8,717. The soil along the streams is fertile. The Cascade range is in the E. part. Gold, silver, and lead exist, but are not mined. The Oregon and California railroad passes through it. The chief productions in 1870 were 479,294 bushels of wheat, 343,298 of oats, 21,917 of barley, 30,295 of potatoes, 108,714 lbs. of wool, 39,400 of flax, 167,660 of butter, and 6,475 tons of hay. There were 4,249 horses, 4,005 milch cows, 4,805 other cattle, 41,171 sheep, and 10,817 swine; 5 manufactories of furniture, 1 of machinery, 3 of saddlery and harness, 4 of sash, doors, and blinds, 7 flour mills, and 11 saw mills. Capital, Albany.

**LINN, John Blair**, an American poet, born at Shippensburg, Pa., March 14, 1777, died in Philadelphia, Aug. 30, 1804. He graduated at Columbia college in 1795, and began to study law in the office of Alexander Hamilton. Within a year his drama of "Bourville Castle, or the Gallic Maidens," was brought out at the John street theatre, but was not successful. He turned his attention to theology, was ordained in 1798, and in 1799 became assistant pastor of the first Presbyterian church in Philadelphia. He engaged in a pamphlet controversy with Dr. Priestley, which gained him much reputation, and was the author of two poems, "The Powers of Genius" (1801), and "Valerian." The latter was published after his death, with a memoir by his friend and brother-in-law Charles Brockden Brown.

**LINNÆA**, a plant of the honeysuckle family, popularly known as the twin flower. The custom of naming the genera of plants in honor of botanists obtained before the time of Linnæus, and has been continued by later systematists to such an extent that there is scarcely a botanist of any note, or person who has aided in any marked manner to develop botanical science, but has a genus named in his honor. Where there are so many genera with personal names, it is particularly fortunate that the genus which bears that of the great master should be distinct and peculiar, and that it should be identified with his early labors. Linnæus collected the plant while on his journey to Lapland, according to his journal, on May 29, 1732. The well known picture of Linnæus at the age of 18 represents him with

the surface with a dense carpet of its tiny foliage; the stem sends up at intervals short erect branches, each of which bears at the summit two graceful, drooping, bell-shaped flowers white or light pink, and very fragrant. But one species is known, and this has a wide distribution, it being found throughout northern Europe, Asia, and North America; in this country it occurs as far south as Maryland, and is very common northward, especially in pine woods. Although a little impatient of removal, when once established it will grow luxuriantly upon an ordinary rockwork.

**LINNÆUS** (Swed. LINNÉ), **Carl von**, a Swedish naturalist, born near Stenbrohult, in the province of Smaland, May 24, 1707, died in Upsal, Jan. 10, 1778. His father, the Protestant minister of the parish of Stenbrohult, was a lover of flowers, and in the well stocked garden of the rectory young Linnæus passed his leisure hours, familiarizing himself almost as soon as he could articulate distinctly with the names of the plants to be found there, as well as those indigenous to the neighborhood. Notwithstanding this manifest predilection for botany, his father, whose circumstances were far from easy, designed him for the ministry, and at 10 years of age Carl was sent to the academy at Wexiö. Here he read with eagerness whatever works on physical science, and particularly on natural history, came within his reach, but made such limited progress in the studies applicable to his intended profession, that the teachers, conceiving a contempt for his intellectual abilities, advised his father to make a carpenter or tailor of him. Fortunately, Dr. Rothmann, a physician of Wexiö, who had noticed his enthusiasm for botany, prevailed on the father to allow him to study medicine and natural history; he received the boy into his own house, and instructed him in physiology, and in botany according to the system of Tournefort. In 1727 he went to the university of Lund, where for a year he was an inmate of the family of Dr. Stobæus, professor of physic and botany, with whose approbation he finally surrendered his whole time to the study of botany. Following the advice of Rothmann, he went in 1728 to the university of Upsal in the hope of finding some kind of employment there. In this he was disappointed, and he was obliged to return to the study of medicine. His situation now became pitiable in the extreme; for months he was frequently in want of food and clothing, and the lectures of Rudbeck, the professor of botany, tormented him with the desire to resume his favorite study. One day during this season of destitution he was observed by Dr. Olaf Celsius, professor of divinity, intently examining a plant in the university garden, and upon being questioned answered with so much readiness and intelligence that he received a proposal from Celsius to assist him in a work on the plants mentioned in Scripture. At the same time he became an inmate of the professor's



*Linnæa borealis.*

this flower in his hand. Later it was named by Gronovius, with the assent of Linnæus, *Linnæa borealis*. The plant is a beautiful little prostrate evergreen, the slender branches of which trail along the ground and bear small roundish leaves in pairs, which cover

house, where a library rich in botanical works was open to him, and was introduced by his protector to Rudbeck. The latter being prevented by the infirmities of age from discharging fully the duties of his office, Linnæus was occasionally deputed to lecture in his place, and acquitted himself with so much credit in this capacity, that in 1731 he was commissioned by the royal academy of sciences in Upsal to make a botanical tour of Lapland. Departing in May, 1732, he performed, mostly on foot, a journey of nearly 4,000 miles within five months, in the course of which he thoroughly explored the desolate region assigned to him. The result of his journey was his *Flora Laponica*, published five years afterward. He was poorly requited for his labors by admission to the academy of sciences and a grant of about \$50 in money; and to provide for his necessities he commenced a course of lectures in the university on the assaying of metals. A Dr. Rosen, professor in the university, jealous of the rising fame of Linnæus, successfully interfered to prevent him from lecturing; and the young naturalist, finding all hope of advancement in Upsal cut off, established himself in Dalecarlia, where he instructed the copper miners in the processes incidental to their occupation. At Fahlun he formed an attachment for a daughter of Dr. Moræus, a physician of the place, aided by whom he went in 1735 to Holland and took the degree of M. D. at the university of Harderwyk. In the same year he published the first sketch of his *Systema Naturæ*, in the form of tables, in 14 pages folio. In Holland he was warmly received, and soon numbered among his friends Boerhaave, Burmann, and Gronovius, by whom he was urged to settle there. At Amsterdam he made the acquaintance of a banker named Clifford, who possessed a magnificent country seat and a garden stored with rare plants at Hartekamp, near Haarlem. At the invitation of Clifford Linnæus took up his residence at Hartekamp, and in the course of the next two years devoted much time to the arrangement of its collections of natural history, and of the plants in the gardens and herbarium. In the interval he visited England at the expense of his patron, and was well received by some of the chief naturalists, including Dillenius and Martyn, professors of botany at Oxford and Cambridge. The period of his residence in Holland was one of extraordinary application; and, aided by the extensive library at Hartekamp, he completed several important botanical works, which his previously unsettled life had not permitted him to pursue uninterruptedly. Among these the *Systema Naturæ* (Leyden, 1735), of which 13 editions appeared in the author's lifetime, and which was translated into most European languages, and the *Genera Plantarum* (1737), hold the first place, the latter being memorable for unfolding with particularity the celebrated artificial system called after the author, and founded on the sexual parts of plants. The

idea of classifying plants after this method had however been broached by him as early as 1731 in his *Hortus Uplandicus*. The *Genera Plantarum* is a monument of industry and application, the author having in preparing it examined the characters of 8,000 flowers. Among his other important works of this period were the *Fundamenta Botanica* (Amsterdam, 1736; 8th ed., Paris, 1774); *Bibliotheca Botanica* (Amsterdam, 1736); *Flora Laponica* (1737); *Critica Botanica* (Leyden, 1737); *Hortus Cliffortianus* (Amsterdam, 1737), a magnificent work, prepared in honor of his benefactor, whose collections it describes; and the *Classes Plantarum* (Leyden, 1738). Wearing finally of the drudgery of his life at Hartekamp, Linnæus returned in the summer of 1738 to Sweden, having first paid a short visit to Paris, where he met a cordial reception from the Jussieus, and was elected a member of the academy of sciences. He was soon after married to the lady to whom five years previous he had been betrothed, and established himself in Stockholm as a physician. Notwithstanding the fame he had acquired abroad as a naturalist, his countrymen failed at first to recognize his merits, and his early efforts to obtain practice met with little encouragement; but within a year he was appointed physician to the fleet and president of the newly established royal academy of Stockholm. The botanical chair at Upsal had always been the chief object of his ambition, and in 1741 he was enabled by his appointment as medical professor at the university to perform the functions of the former office, his old opponent, Rosen, who had succeeded Rudbeck, consenting to an exchange of duties with him. Before entering upon his professorship he made a scientific survey of the islands of Öland and Gottland in the Baltic, the reflections and observations resulting from which were embodied in a Latin oration "On the Necessity of Travelling in one's own Country," which he pronounced before the university upon being inaugurated into office. He soon made the botanical chair of Upsal the most famous in that department of science in Europe, and students flocked from all parts of the continent, from the British isles, and even from America, to receive his instructions. Many of these, including Loeffling, Osbeck, Solander (naturalist in Capt. Cook's first voyage), Kalm, Hasselquist, and others, were worthy disciples of their master, and by their explorations in both hemispheres, undertaken at his suggestion, greatly advanced the cause of science. Strangers were even attracted to Upsal solely to see and converse with Linnæus; and so great was the enthusiasm for the study of natural history, that the king and queen of Sweden had their separate collection of rarities, which were arranged and described by him. The academical garden, which had been for many years neglected, became one of the first objects of his attention, and within six years he increased the number



of exotic plants from 50 to 1,100, besides adding largely to the Swedish plants which it contained. Distinctions of all kinds were showered upon him. He received the much coveted appointment of botanical professor, and in 1746 the rank and title of archiater; in 1757 he was ennobled and took the title of Von Linné; the chief learned bodies of Europe enrolled him among their members; and the king of Spain endeavored in vain, by the offer of a liberal salary and letters of nobility, to induce him to settle in Madrid. His material prosperity kept pace with his fame, and during the last 20 years of his life his leisure hours were passed in ease and affluence at a country seat purchased by him at Hammarby near Upsal. His literary and scientific labors were pursued with untiring energy, and from all parts of the world he was constantly receiving rare specimens of animals, plants, and minerals to add to the rich collections of the university, and to enable him to perfect and systematize the results of his former inquiries. The herbarium of Linnæus, a small affair as compared with the collections of botanists of the present day, is now in the possession of the Linnæan society at London. After the king of Sweden learned that it had been sold, and was already on its way to England, he despatched a man-of-war to overtake and restore it, but without effect. A careful examination of his herbarium shows that Linnæus did not exercise the care necessary to make it of value in determining his plants, and it is of little use save as a memento of the great botanist. His chief publications after his establishment at Upsal comprise the *Flora Suecica* (Leyden, 1745); *Animalia Suecica* (Stockholm, 1745); *Fauna Suecica Regni* (1746); *Hortus Upsaliensis* (1748), a description of the academical garden; *Materia Medica e Regno Vegetabili* (1747); *Amnitates Academicæ* (Leyden, 1749-77), a collection of treatises on various subjects bearing the names of his pupils, but inspired and revised by himself; *Materia Medica e Regno Animalis* (Upsal, 1750); *Philosophia Botanica* (Stockholm, 1751; four other editions appeared in the lifetime of the author), the principal work on the Linnæan system of botany, and that from which many popular introductions have been compiled; and the *Species Plantarum* (2 vols. 8vo, 1753), the author's most important contribution to scientific literature. In this last work, which Haller calls *maximum opus et æternum*, he first adopted trivial names expressing some obvious character to designate species, thus dispensing with the clumsy and tedious descriptions which naturalists formerly employed, and rendering it possible to speak of every known plant in two words. So highly is the work still esteemed that an edition of it, together with the *Genera Plantarum* and other writings of Linnæus in the form in which he left them, was published in Leipsic in 1840, under the title of *Codex Botanicus Linnæanus*, collated by Dr.

Hermann E. Richter. A similar improvement was carried out in other branches of natural history, his works upon which, though less important than those devoted to botany, are characterized by the same lucid classification and logical precision. In 1774, while lecturing on botany, he experienced an attack of apoplexy, which incapacitated him for the active discharge of his professional duties. Two years later a second attack paralyzed his right side and impaired his faculties, and the remaining months of his life were passed in mental darkness, which the sight of flowers and opening buds and other familiar and beloved objects could never wholly dispel. His death was the signal for a general mourning in Upsal; a medal was struck and a monument erected to his memory, and the king of Sweden pronounced a panegyric upon him in a speech from the throne to the assembly of the states.—The sexual or artificial system of Linnæus, though generally adopted soon after its promulgation, has failed to stand the test of time, and has long been replaced by the natural one of Jussieu, De Candolle, and their followers; but it accomplished a useful purpose in reducing to order the chaotic state in which classification in all branches of natural history was involved, and was applicable to the comparatively few plants then known to naturalists. It does not appear that the author regarded it otherwise than as a temporary expedient. As a promoter of the study of botany, and indeed of all the principal branches of natural history, his merit was transcendent, and the enthusiasm and the systematic spirit of inquiry with which he imbued his pupils raised botany within a brief period to the position of an almost perfected science. In stature Linnæus was diminutive, with a large head, and quick, piercing eyes. His temper was irascible, but he was easily appeased, and his relations with his pupils and scientific associates appear to have been on an agreeable footing. He was vain to excess, and is said to have persecuted his only son at the instigation of his wife, a woman of profligate character. Five children survived him, one of whom, Elizabeth Christina, inherited much of her father's genius. She was the first naturalist to observe the inflammability of exhalations of certain plants, and also the electric sparks to be drawn from the nasturtium. The son succeeded his father in the botanical chair at Upsal, but was not distinguished by discoveries. The family is now extinct.

**LINNELL, John**, an English painter, born in London in June, 1792. He first exhibited at the academy in 1807, and in 1809 gained the prize at the British institution for the best landscapes. For many years he mainly painted portraits, among which are many of distinguished persons, but subsequently devoted himself to landscape and figure painting. Among his works are: "The Morning Walk" (1847); "The Windmül" and a "Wood Scene," in the

Vernon gallery (1848); "The Return of Ulysses" (1849); "Christ and the Woman of Samaria" (1850); "The Disobedient Prophet" (1854); "The Timber Wagon;" "Under the Hawthorn;" "Crossing the Brook;" "The Last Glean before the Storm;" and "Harvest Showers" (1868).

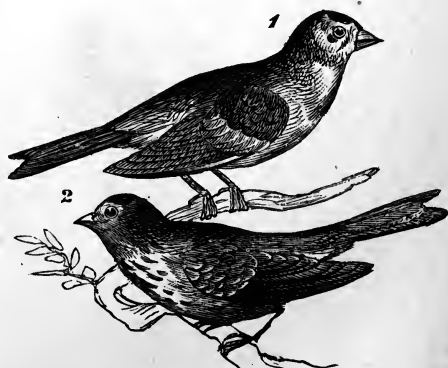
**LINNET**, the name of several birds of the finch family, of the genus *linota* (Bonap.) or



Brown Linnet (*Linota cannabina*).

*ægiothus* (Cab.); the distinguishing characters have been given under FINCH, in the genus *fringilla* of which they are placed by Gray. The common brown linnet of Europe (*L. cannabina*, Selb.) is about 5½ in. long, with an extent of wings of 10 in.; the bill is moderately thick, the head small, the body ovate, the wings and tail moderate, and the tarsi very short and much compressed. In the adult male the winter plumage is reddish brown above with darker streaks, the throat yellowish gray streaked with brown, the forehead and breast reddish with yellowish gray edgings, and the bill dusky above; in the female the upper parts are streaked with dusky brown and grayish yellow, the lower yellowish gray with brownish streaks on the throat, breast, and sides; the young resemble the female. In summer the throat is whitish with brown streaks, the back and wing coverts reddish brown, with the forehead and breast rose red. This is the largest and most robust of the true European linnets, and one of the most lively; it is called brown, gray, or rose linnet, according to the season of the year and sex. Toward winter they assemble in flocks and visit farm yards in search of seeds, sometimes in company with other finches; the flight is rapid and undulated, and the motions on the ground are active; the song is soft and mellow, and so varied and sweet as to render them great favorites as cage birds. They are easily raised from the nest, and eat the same food as the canary, with which as well as with the goldfinch they will pair. The nest is usually in a bush, very neatly made, and the

eggs, four to six, are three fourths of an inch long, bluish white with purplish and reddish brown spots, especially at the larger end; there are commonly two broods in a season, the first being abroad by the end of May. As their name imports, they are very fond of the seeds of flax. The mountain linnet or twite (*L. montana*, Selb.) resembles the preceding, but is smaller, with a yellowish bill, and without any red on the head and breast or streaks on the throat. The green linnet has been described under FINCH.—There are two linnets common to northern Europe and America, the lesser and the mealy red-poll linnet, referred, as above stated, to the genus *ægiothus* (Cab.). The lesser red-poll linnet (*Æ. linarius*, Cab.) is 5 in. long and about 9 in extent of wings; these reach to the middle of the deeply forked tail. The color above is light yellowish, with dark brown streaks; the crown crimson, and the upper breast and sides tinged with the same; rump and under tail coverts still lighter with dusky streaks; rest of under parts white, streaked with brown on the sides; lores and chin dusky; cheeks and narrow front whitish; wing and tail feathers edged with white; two yellowish white bands across the wing coverts; bill yellowish; this is the winter plumage, there being much more red in the spring. It is a lively, familiar, and favorite bird; the flight is peculiarly buoyant, and the notes are clear and loud; in the winter large flocks resort to the woods of birch and alder, on the seeds of which they feed. It is often kept as a pet in Europe for its lively and gentle disposition; it pairs with the canary and goldfinch. It is distributed generally over the northern and temperate parts of Europe and eastern North America, going south in winter, and is found as far west as Washington territory. The



Lesser Red-poll Linnet (*Ægiothus linarius*).  
1. Male. 2. Female.

mealy red-poll linnet (*Æ. canescens*, Cab.) is 6 in. long; the colors are as in the preceding species, but the edges of the feathers are paler and hoary, the rump grayish white, and the lower parts nearly white. It inhabits Greenland and the northern portions of the conti-

nent, and doubtless occasionally wanders within the limits of the United States, as it does into Great Britain.—The bird commonly called linnet by dealers in New England is the purple finch (*carpodacus purpureus*, Gray), described under FINCH.

**LINSEED OIL**, or **Flaxseed Oil**, an oil expressed from the seeds of flax, and very extensively employed in the arts, and particularly in the preparation of paints for woodwork and other surfaces. It is the type of a class called drying oils, on account of possessing the property of forming a hard resinous mass from oxidation and exposure to the air. Thus employed it makes with the powdered substance called the body a paste, and on drying acts both as a cement and a varnish. The seeds, either in their raw state or roasted, are ground in mills, and the powder is then subjected to powerful hydraulic pressure. By roasting, the gummy matter in the interior coating of the seeds is destroyed, and the oil is obtained more free from mucilage, but it is of higher color and more acrid than that expressed from the raw seeds. Linseed oil freshly pressed is of a golden yellow color, which turns to dark brown with age. When fresh and cold pressed it is without disagreeable taste, but the commercial oil has a peculiar smell and taste. Its specific gravity is 0.940. At 600° F. it boils, and at about zero, or 4° below, it solidifies. Exposed a short time to the air, it becomes rancid; but on being agitated with warm water and allowed to stand till the two fluids separate, the oil may be decanted sweet. Its chemical composition, according to Sacc, is that of an oleate and margarate of glycerine, containing no stearate. Sulphur dissolves in hot linseed oil with a red color, partially crystallizing on cooling; on longer heating, the oil takes up with solution of sulphydric acid one fourth its weight of sulphur, forming a brown viscid mass (fatty balsam of sulphur). Boiled with phosphorus, it acquires a scarlet color. On mixing from 15 to 25 parts of chloride of sulphur with 100 parts of linseed oil, products resembling caoutchouc are formed, hard in proportion to the amount of sulphur. Linseed oil takes fire with fuming nitric acid; and shaken with very dilute nitric acid, it is decolorized and finally converted into a varnish. It dissolves oxide of lead when heated, by which it is decolorized and rendered more drying, forming what is called boiled oil. According to Bucholz, it dissolves in 5 parts of boiling and 40 parts of cold alcohol. Besides the uses already named for this oil, it is largely applied in the manufacture of varnishes as a vehicle for the harder resins, to which it imparts softness and toughness. But for the best varnishes it is necessary to clarify the oil by repeated skimming while it is allowed to simmer at nearly the boiling point, afterward boiling it with calcined magnesia, and letting it stand at least three months for the impurities to subside with the magnesia.—Linseed oil is an important commercial pro-

duct, and is largely imported into the United States from Europe. The English import the seed from the East Indies, Russia, Germany, Holland, and America. From this they obtain the oil, and make of the residue, called oil cake, an important article of food for cattle. This incidental product of the manufacture of linseed oil is also largely used for the same purpose in the United States.—As the chief use of linseed oil is in decorative painting for the sake of its drying quality, it is essential that it should be free from mixture with other oils of a different nature, and from all other foreign ingredients possessing properties incompatible with this application. It is unfortunately the case, particularly with seed obtained from tropical regions, that other oleaginous seeds of plants that have grown up with the flax are intermixed with those of the latter; and the oil they furnish not possessing the same drying character, the product is thereby seriously impaired. Linseed oil is moreover intentionally adulterated, as with common rosin dissolved in it, also with rosin oil, and with various fats and non-drying oils. The effect of rosin is to render the paint when apparently dry easily affected by warmth, even that of the hand, so as to be softened and made sticky. To detect the rosin or rosin oil, it is sufficient to heat a small portion in a porcelain cup, when the peculiar odor of the substance will be noticed if only  $\frac{1}{1000}$  part be present. To detect the presence of fats or non-drying oils, the practice is to touch the centre of a drop or two of the oil placed upon a white plate with a drop of sulphuric acid conveyed at the end of a glass rod; changes of color are thereby induced, and the formation of concentric rings of various shades, which suggest to an experienced eye the nature of the oil and of its adulterations. More perfect methods of testing linseed oil are very much to be desired.—In medicine linseed oil has sometimes been used internally as a laxative in the dose of a fluid ounce. It may be used externally as an ingredient of resin cerate, or of the *linimentum calcis*, sometimes called Carron oil. It is occasionally employed as a vehicle for the external application of carbolic acid or in the carbolic acid putty.

**LINTON**, **William**, an English painter, born in Liverpool about 1790. He was originally engaged in mercantile business, but subsequently devoted himself to art, and in 1819 exhibited at the British institution a picture of "A Carpenter's Shop," which was warmly commended. He afterward travelled in Italy, Greece, and Switzerland, and most of his works relate to those countries. Among them are: "Italy," "The Temple of Fortune," "The Embarkation of the Greeks for Troy," "A Greek City, with the Return of a victorious Armament," "Venus and Æneas," "Etna and Taormina," "The Lake of Lugano" (1838), "Corinth" (1842), "The Bay of Naples" (1843), "Jerusalem at the Time of

the Crucifixion," "Bay and Castle of Baiæ" (1845), "Athens" (1847), "Temple of Minerva at Rome" (1850), "Venice" (1851), "A Mountain Town in Calabria" (1853), and "The Tiber" (1856).

**LINTON, William James**, an English engraver, born in London in 1812. He entered warmly into the radical movements from 1844 to 1848, and was deputed to carry to the French provisional government the first congratulatory address of the British workmen. As an engraver on wood he ranks in the first class, and has prepared and illustrated "The History of Wood Engraving" and a series of "Works of Deceased British Artists" (1860). He has contributed largely to periodicals, and published "Claribel and other Poems" (1865), "A Life of Thomas Paine," and three volumes of "The English Republic." In 1867 he came to America, and took up his residence in New York, where he executed several admirable works. He subsequently removed to New Haven, Conn., where he conducts a large engraving establishment.—**ELIZA (LYNN)**, his wife, born at Keswick in 1822, has published "Azeth, the Egyptian" (1846); "Amynone, a Romance of the Days of Pericles" (1848); "Realities" (1851); "Witch Stories" (1861); "The Lake Country," illustrated by her husband (1864); "Grasp your Nettle" (1865); "Lizzie Lorton of Greyrigg" (1866); "Sowing the Wind" (1867); "Ourselves: Essays on Women" (1869); "The True History of Joshua Davidson, Christian and Communist" (1872; 6th ed., 1874); and "Patricia Kemball" (1874).

**LINUM**, the classical name of flax, and the botanical name of a genus of which that is the most important member (see **FLAX**), containing

several species cultivated as garden plants, both annual and perennial, not mentioned under that title. *L. grandiflorum* is a very showy annual from Algiers; the plant is much branching, about 18 in. high, and bears a profusion of brilliant scarlet flowers, shaded with crimson toward the centre, and over an inch in diameter; the plant rarely produces seed in this country. Among the perennial species none is more graceful than *L. perenne* of Missouri and westward; this, known in our gardens as perennial flax, forms tufts of slender stems 12 to 18 in. high, which produce an abundance of bright blue flowers an inch in diameter, upon such delicate flower stalks that at a little distance they seem to be floating without any support; there is a white variety of this in cultivation. Berlandier's flax (*L. Berlandieri*) is a fine yellow-flowered species in Texas; and similar to it is *L. flavum*, a common greenhouse species with yellow flowers. They all grow readily from seed.

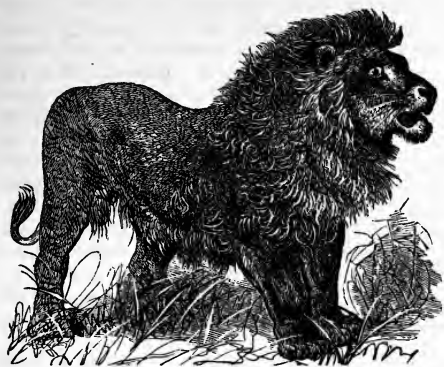
**LINZ**, or **Lintz**, a town of Austria, capital of the province of Upper Austria, at the confluence of the Traun with the Danube, which is here crossed by a wooden bridge 1,800 ft. long, 93 m. W. of Vienna; pop. in 1870, 30,538. It has two suburbs, one of which is separated from the city proper by the Danube. The former fortifications, constructed in 1831-'6, consisted of 32 detached forts, covering a circuit of 9 miles, and communicating by covered ways; they were rendered useless by recent improvements in artillery, and have been to a great extent demolished. The Landhaus, formerly a Franciscan convent, is now occupied by the diet of Upper Austria and the government offices. It was modernized after the fire of 1800. A modern Gothic cathedral was erected in 1863. The Hofburg is built on the site of the ancient archducal palace, destroyed by fire in 1800. There is a government carpet and cloth manufactory, founded by Maria Theresa, and manufactures of woollen, linen, silk, and cotton goods. There are two annual fairs, each of which lasts a fortnight. Linz is the seat of a bishop, and has a theological seminary, a lyceum, a gymnasium, a surgical school, a national museum containing a natural history collection, and educational institutions of a high grade. The vicinity is noted for beautiful scenery.

**LION** (*leo*, Leach, and *felis leo*, Linn.), the largest and most majestic of the cat family, an inhabitant of Africa and Asia. Several species are made by some zoologists, and these are even elevated into a genus distinct from *felis* by Leach; but the specific distinctions are doubtful, and it is more consonant with the prevailing tendency of naturalists to consider these as varieties of a single species. The best known variety is the African lion, whose great strength, noble appearance, and assumed magnanimity have been the theme of travellers from time immemorial; the male has a long and thick mane, which gives an appearance of nobleness



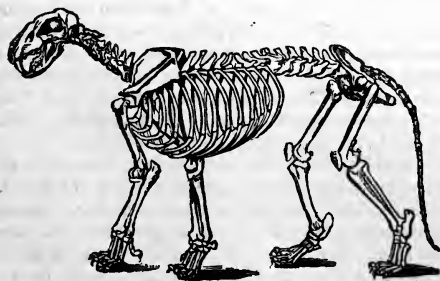
*Linum grandiflorum.*

to the animal; the tail has a tuft at the end, which is absent in the tiger and the various spotted cats; the usual color is tawny, with the mane dark, approaching to black; in some the color is much lighter, and in others dark-



African Lion.

er, and there is considerable difference in the amplex of the mane, but the color is always uniform and without spots; the females are destitute of mane. The average length of a full-grown lion is between 6 and 7 ft., exclusive of the tail, and the height at the shoulder nearly 3 ft.; specimens are on record considerably larger than this. The chest and shoulders are broader and the neck thicker than in any others of the family, indicating great strength in the anterior extremities; it can carry off a good-sized heifer with ease, and can drag to a considerable distance an ox or a horse. The lioness is smaller than the lion, with more slender and graceful form, and is more agile in her movements and impetuous in her passions. The appearance of the lion when in confinement or unannoyed does not convey the idea of ferocity inspired by the tiger, and his wide



Skeleton of the Lion.

forehead, overhanging brows, and shaggy mane give him a majestic look which well entitles him to the appellation of "king of beasts;" but when irritated, there is sufficient evidence that the passion and power of the feline race in him reach their greatest development.—In

ancient times lions were far more extensively distributed than at present. They abounded in S. E. Europe, and Herodotus relates that the camels which accompanied the army of Xerxes were attacked by lions while on the march through Macedonia. Pausanias also speaks of lions as inhabiting the mountains between Macedonia and Thessaly. From the Scriptures it is evident that lions were once common in Syria and Palestine, where they are no longer found; and they have also disappeared from other parts of Asia which they formerly inhabited. Their abundance in ancient times is shown by the fact that in 40 years 1,000 lions were killed at Rome in the amphitheatres, where sometimes 100 at a time were exhibited in the arena. The advance of population and civilization, and especially the general use of firearms, have caused their extermination in many countries, and are gradually driving them into narrower limits. At the present day they are found only in Africa and in Arabia, Persia, India, and on the banks of the Euphrates. In Africa there are four varieties, the Numidian lion, or lion of Barbary, the lion of Senegal, and two varieties of the Cape lion or lion of south Africa. The Barbary lion is brown, and the male has a very thick mane. The Senegal lion is of a yellow hue with a thinner mane. Of the two varieties of the Cape lion, one is yellowish and the other brown, and it is said that some with black manes have been seen in that region.—The lion prefers an open level country, such as affords pasture to the immense herds of antelopes, well watered, and with sufficient thicket to shelter him from the midday sun; a favorite haunt is about some spring, where he can easily procure prey as they come to drink. When not pressed by hunger, the lion generally lies concealed during the day, feeding at early dawn and evening, but occasionally prowling during the whole night around the herds of wild animals, the flocks of the inhabitants, or the encampment of the traveller; skulking from man in the daytime, at night he becomes bold, tearing a bullock or a horse from the enclosure, and sometimes dragging a human victim from the midst of a sleeping circle around a watch fire; his most frequent prey, however, are the various kinds of antelopes, zebras, gnus, giraffes, and wild cattle; the horse is believed to be especially relished by the lion. The breeding place is generally in some deep cover, which is carefully guarded by both parents; gestation is about 110 days, and from two to four young are produced at a time, born with eyes open, but helpless for some weeks; the female is exceedingly ferocious when taking care of her young. Several lions have been born in menageries both in Europe and America, some of which have been raised, though most die at the shedding of the milk teeth, if not in the first few weeks of life, from the neglect of the mother or her inability to supply proper nourishment; the whelps have



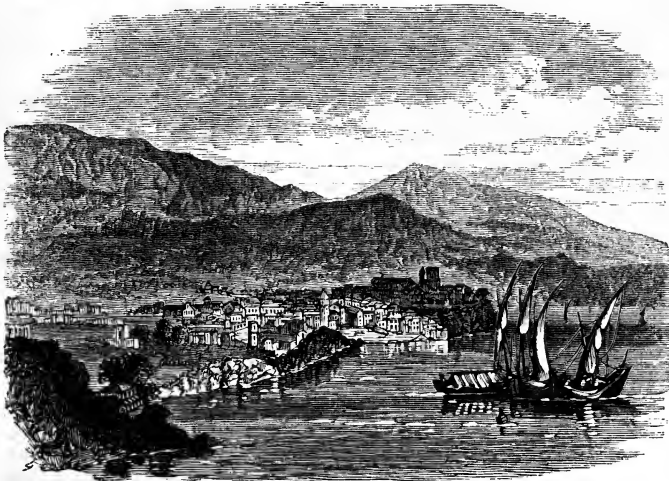
a frizzled fur, brindled or clouded with dark brown, and with a dark dorsal line; the shaggy mane and tufted tail begin to appear about the third year, attaining their full development in the seventh or eighth; the average age of the lion is about 25 years, though individuals have lived in confinement much longer than this. As seen in menageries, the lion is one of the most tractable of the large *felidæ*, and shows gratitude and attachment to those who treat it kindly; it is susceptible of being trained to perform certain feats, and to permit familiarities with its formidable jaws and claws which make the spectators shudder; whipping, pulling open the jaws, and placing the head within the range of their teeth, evince a rash courage in their keepers which few but a Van Amburgh or Driesbach would care to imitate.—The lion of the menagerie is a very different animal from that seen in its native wilds; hunting it in Africa is not a very dangerous sport for men of nerve, though it is rarely indulged in for the mere sake of sport unless by a Gérard or a Cumming. The natives occasionally assemble to destroy it, when their flocks have suffered severely; on these occasions the animal is worried in the daytime, when it is timid and unable to see very clearly, or when satiated with food, by dogs and men, and is generally easily killed if the hunters have the courage to approach within gun-shot. Livingstone, though he had sufficient reason for dreading the king of beasts, speaks of him in a manner which detracts greatly from his regal and magnanimous character; according to him, the lion fears man, except at night, and never attacks him unless from necessity, a "man-eater" being always an old animal, whose decaying teeth force him to come to the villages in search of prey; seen in the daytime, he finds nothing very majestic in his appearance, but merely an animal somewhat larger than the largest dog, partaking very strongly of the canine features, and very unlike the usual representations; he stands a second or two gazing, turns and walks slowly away for a dozen paces, looking over the shoulder, then begins to trot, and, when nearly out of sight, bounds off like a greyhound. By day there is not, as a rule, the smallest danger of lions which are not molested attacking a man, nor even on a clear moonlight night, unless during breeding time; travellers always tie up their cattle and horses on dark rainy nights, but not on moonlight ones. The approach of the lion is stealthy, and any appearance of a trap will prevent his making a spring. Lions are abundant where game is plenty; six or eight, probably one family, occasionally hunt together. Livingstone says: "One is in much more danger of being run over when walking in the streets of London, than he is of being devoured by lions in Africa, unless engaged in hunting the animal." As to the roar of the lion, he says that in a dark and stormy night and in an exposed situation it

might inspire fear, but not otherwise, and that the ostrich makes a noise as loud and with difficulty distinguishable from it; as to his prowess, a large buffalo is more than a match for him, as a single toss would disable him; lions never approach a full-grown elephant, and rush off at the very sight of a rhinoceros. Gordon Cumming does not write so disrespectfully of the king of beasts, but is delighted with his noble appearance, regards his roar as extremely grand and powerful, and from personal experience considers lion hunting under all circumstances decidedly a dangerous pursuit.—The Asiatic variety of the lion is inferior in size, strength, and fierceness, with less ample mane, of a uniform pale fawn color, and with less width of head and nobleness of bearing. Lion hunting in Asia is attended with great pomp and show, and with comparatively little danger on account of the open nature of the districts infested by them, and the consequent fair mark they present to the bullet; occasionally an enraged and wounded animal gives evidence of his strength by pulling the largest elephant to the ground, to the great peril of his riders. The maneless lion of Guzerat, described by Capt. Smee, is probably a variety of the preceding.—Cuvier and others describe a fossil lion (*F. spelæa*) as occurring in the caverns of the diluvial epoch in Europe as far north as Great Britain; some of the fragments found indicate an animal one fourth larger than the existing lion; their remains are found with those of bears and hyænas in the caverns of Kirkdale and Gailenreuth, though less abundant.

**LIPANS**, a tribe of American Indians, a branch of the Apaches. In the last century they roamed of the Rio Grande and the borders of Chihuahua to the grounds of the Comanches, and made war on the Spanish frontiers and the more settled tribes. In 1721 they killed the missionary Father Joseph Pita at a place which was called in consequence Carniceria. They resembled their allies the Comanches in their habits, but were more enterprising and warlike. They made some progress in civilization, and many learned to speak Spanish. They thus came to figure in the revolutions of Mexico; 300 Lipans under Capt. Menchaca formed part of the force which captured Hidalgo in Coahuila in 1811; and in 1813 a party of them under Capt. McFarland were engaged in the battle of Rosales, where the Spaniards were defeated. When Texas became a republic, the Lipans were next to the Comanches the most powerful tribe in its territory. They ranged from Austin to Corpus Christi, and, though brave and daring, seem not to have often molested the Texans, but plundered the Mexicans. In the summer of 1848 a collision occurred with the Texans, with loss on both sides. The Lipans then retired up the Brazos, and began a desolating war. They gave up their Mexican prisoners in 1851, and were advised to avoid the hostility of the Texans, whose settlements

were spreading, and who disregarded the old established Indian line. Texas finally established reservations in 1854, but the Lipians, instead of going on them, returned to Mexico, numbering at the time 560, and constantly raided into Texas. After the close of the civil war the United States endeavored to draw back the Indians who had gone to Mexico. Some of the Lipians entered New Mexico in 1872, but did not remain. The next year a party raiding into Texas were pursued by Gen. McKenzie, who struck a Kickapoo camp, killing several. Soon afterward the Kickapoos were induced to remove back to the United States, but efforts to recover the Lipians failed.

**LIPARI. I.** A group of volcanic islands (anc. *Æolia* or *Vulcania insule*) in the Tyrrhenian sea, between the W. coast of Naples and the N. coast of Sicily, from which they are distant from 12 to 40 m.; pop. about 22,000. The isl-



Town of Lipari.

ands are 17 in number; the principal of them are Lipari, Vulcano, Stromboli, Salina, Panaria, Felicudi, and Alicudi, with many adjacent islets and rocks. They are all mountainous. The climate is salubrious and the air pure, and the principal products are fruits, wine, cotton, corn, peas, beans, &c. Storms and earthquakes are frequent. Lipari (anc. *Lipara*), the largest of the islands, is about 18 m. in circuit; pop. about 18,000. It supplies Europe with pumice stone, of which its surface is almost wholly composed. None of the islands except Lipari appear to have been anciently inhabited to any extent. At the commencement of the second Punic war a Carthaginian squadron was wrecked on the shores of Lipari and the island of Vulcano. Lipari was prosperous under the Romans, and was sometimes used as a place of exile for political offenders. It was much frequented for its hot springs, one of which still remains in use. **II.** A town, capital of the

group, on the E. coast of Lipari island, with a harbor nearly 2 m. in circuit, 38 m. N. W. of Messina; pop. about 6,000. It has an active trade in the produce of the islands with Palermo, Messina, and Naples. It contains a castle, a bishop's palace, several churches, a hospital, and some remains of antiquity. The greater part of the present fortress was built by Charles V. about the middle of the 16th century, after the town had been plundered by Khair ed-Din (Barbarossa).

**LIPETZK**, a town of Russia, in the government of Tambov, on the Voronezh, 230 m. S. S. E. of Moscow; pop. in 1867, 14,239. It is noted for its manufactories and mineral springs.

**LIPPE**, or **Lippe-Deimold**, a German principality, bounded N. E. by the Prussian province of Hesse-Nassau, E. by the province of Hanover and by Waldeck, and on all other sides by Westphalia; area, 437 sq. m.; pop. in 1871,

111,135, of whom 2,638 were Roman Catholics, 1,035 Jews, and all the others Protestants, mostly Reformed. It is traversed by chains of the Teutoburg mountains, called here *Lippe'scher Wald*, and drained by the Werre and other small tributaries of the Weser. The staple productions are flax and timber. The principality comprises the counties of Lippe, Schwalenberg, and Sternberg, and several Westphalian places. The principal towns are Deimold, the capital, and Lemgo. — In 1815 the principality became one of the states of the German confederation; in 1866 it joined the

North German confederation; and since the beginning of 1871 it has formed part of the German empire. In 1848 a new constitution was promulgated, but the former and less liberal one was restored in 1853. The diet consists of only one chamber, numbering 21 deputies, 7 of whom are chosen by the nobility and 14 by the towns and rural communities. The revenue in 1871 amounted to \$189,000, the expenditures to \$186,000; the public debt in 1872 was \$304,000. In virtue of a special military treaty with Prussia, the military force has been incorporated with the Prussian army.

**LIPPE - SCHAUMBURG.** See SCHAUMBURG-LIPPE.

**LIPPI. I.** *Fra Filippo*, an Italian painter, born in Florence in 1412, died in Spoleto in 1469. He was of obscure parentage, and at an early age found refuge in the convent of the Carmelites in Florence, where he was induced by poverty to assume the habit of the order.

According to Vasari, he was the pupil of Masaccio. Impelled partly by a passion for his art, partly by a love of pleasure, he escaped to Ancona when about 18 years old, renounced his sacred profession, and established himself as a painter. While on a sea excursion near Ancona, he was captured by a Barbary corsair and carried into captivity in Africa. Drawing one day a sketch of his master in charcoal, the latter was so much pleased with the performance that he released him and sent him home. Fra Filippo visited Naples and Rome, gaining, in spite of his profligate life, so much celebrity that the Medici family recalled him to Florence. In 1459, while engaged in painting the walls of the convent of Santa Margherita in Prato, he seduced a young novice named Lucrezia Buti, who had sat for one of the figures in his pictures, and carried her away from the convent; a crime which it needed all the influence of the Medici to prevent the community from punishing summarily. A dispensation was finally procured from the pope to enable Fra Filippo to marry Lucrezia; but as he neglected to do so, her family contrived, it is said, to have him poisoned. He is generally considered one of the greatest of the painters before Raphael, and was one of the first to design the human figure of the size of life, and to paint landscape backgrounds with some feeling for nature. **II. Filippino**, the natural son of the preceding by the novice Lucrezia Buti, born in Florence in 1460, died in 1505. He followed the profession of his father, though free from his libertine tastes, and was among the first to introduce ornamental accessories from the antique into pictures. Many of his frescoes remain in Rome and Florence, some of which were long supposed to be by Masaccio.

**LIPPINCOTT, Sara Jane** (CLARKE), an American authoress, known by her *nom de plume* of "Grace Greenwood," born at Pompey, Onondaga co., N. Y., Sept. 23, 1823. Much of her childhood was passed at Rochester. About 1842 she removed with her father to New Brighton, Pa., and in 1853 was married to Leander K. Lippincott of Philadelphia. She published occasional verses at an early age under her own name, but her first prose publications appeared in the "New York Mirror" in 1844, under the signature which she has since retained. She has published "Greenwood Leaves" (1850-'52), "History of my Pets" (1850), "Poems" (1851), "Recollections of my Childhood" (1851), "Haps and Mishaps of a Tour in Europe" (1854), "Merrie England" (1855), "Forest Tragedy and other Tales" (1856), "Stories and Legends of Travel" (1858), "History for Children" (1858), "Stories from Famous Ballads" (1860), "Stories of Many Lands," "Stories and Sights in France and Italy," "Records of Five Years" (1867), and "New Life in New Lands" (1873). She is also the author of several addresses and lectures, and has been largely connected, as editor or contributor, with periodical literature.

**LIPTÓ** (Ger. *Liptau*), a county of N. Hungary, watered by the Waag, an affluent of the Danube; area, 872 sq. m.; pop. in 1870, 79,273, mostly Slavs. The N. E. portions belong to the highest division of the northern Carpathians, known as the Tátra range. The inhabitants are engaged in agriculture and raising of cattle. There are mines of gold, silver, copper, and iron. Capital, Szent-Miklós.

**LIQUIDAMBAR** (*L. styraciflua*), the sweet gum tree or bilsted, a large deciduous tree, placed by some botanists in a family by itself, while others unite it with the witch hazel and a few other genera to form the witch-hazel family, the *hamamelaceæ*. The tree grows 60 to 70 ft. high and 2 ft. or more in diameter, with a grayish bark; the small branches and twigs have the corky layer of the bark developed as prominent longitudinal ridges; the rounded leaves are five- to seven-lobed, giving them a star shape, unlike those of any others



Liquidambar.

of our forest trees; the lobes are pointed and glandular serrate; the leaves are 3 to 6 in. in diameter, smooth and shining, and fragrant when bruised. The flowers are usually monoecious, in globular heads or catkins; the staminate clusters consist of numerous stamens intermixed with scales; the fertile flowers consist of two-celled, two-beaked ovaries, with scales in place of a calyx, and cohering in a globular head. The fruit is a spherical woody mass an inch or more in diameter, prickly with the hardened beaks of the ovaries; the seeds are small, winged, escaping from the head by openings between the beaks. But a very small proportion of the seeds perfect themselves, and the pods are filled with the abortive ones, which appear like sawdust. The tree is found from southern New England to Illinois and southward to the gulf. The wood is soft, fine-grained, and can be readily stained or polished,

but on account of its want of durability can only be used for interior work; hence it has but little value as a timber tree, and it is a very poor fuel. A decoction of the bark is used as a domestic remedy in diarrhœa and other cases requiring astringents; the leaves of the tree, according to Porcher, contain large amounts of tannic and gallic acid, and their employment in tanning has been suggested. The generic name, which is a mongrel compound of Latin and Arabic, means liquid amber, and has reference to an exudation resembling storax, which is only developed in the tree in warm climates. (See BALSAMS.) The chief utility of the tree is in its ornamental character; and for planting for decorative purposes it is in some respects not excelled by any other native of our forests. When crowded by other trees, it is drawn up with a straight trunk and presents but little beauty; but where it has room to properly develop itself, it forms a fine, broad, rounded head like a maple, and with its bright, clean, star-shaped leaves is a most attractive object. Its greatest beauty is however seen in autumn; its foliage in ripening assumes various pleasing tints, ultimately becoming a dark purplish red or crimson, and adding essentially to the brilliancy of the autumn landscape. The tree is readily raised from seed, but cannot be successfully transplanted from the forest unless taken when very young.

**LIQUORICE**, or **Licorice**, a medicinal article derived from plants belonging to the genus *glycyrrhiza* (Gr. γλυκύς, sweet, and ρίζα, a root), commonly from the *G. glabra*, and probably a portion is furnished by *G. echinata*. A species, *G. lepidota*, is found on the shores of Lake Erie, but more abundantly further west, which has in a measure the taste of the foreign plant. The glycyrrhizas are herbaceous plants of the natural order *leguminosa*, having erect stems 4 or 5 ft. high, with few branches, leaves alternate, pinnate; flowers violet or purple, formed like those of the pea, and arranged in axillary spikes on long peduncles. The fruit is a smooth or bristly pod, with one to four small kidney-shaped seeds in a single cell. The root, which is perennial, attains the length of several feet, and is sometimes more than an inch in diameter. When three years old it is dug, and when cleansed and dried is ready for the market, in which state it is known as liquorice root or stick liquorice. The extract of liquorice, sometimes called in commerce Spanish juice, and popularly known as ball liquorice, is prepared by boiling the root with water; the saturated decoction is then decanted off and evaporated to proper consistence for forming the substance into cylinders 5 or 6 in. long and an inch in diameter. These, packed in cases with bay leaves, are the extract of liquorice of commerce. It is dry and brittle, of shining fracture, of sweet and peculiar taste, and, if pure and genuine, entirely soluble in water. This, however, is rarely the

case, for the article is subject to gross adulterations. The Spanish liquorice is frequently nothing else than a mixture of the juice with the worst kind of gum arabic, called Barbary gum. Metallic copper scraped off the evaporating pans is very frequently present; and starch and flour sometimes constitute nearly one half of the substance. These adulterations Dr. Hassall found extended to the different kinds of roll and pipe liquorice, and Pontefract lozenges, which last, made near the town of that name, are usually considered as presenting a very pure form of the extract. Liquorice is refined by dissolving the impure extract in water without boiling, separating the insoluble matters and also the acrid oleo-resinous portions which by long boiling were extracted from the root, and reforming the article in cylinders of the size of pipe stems. But in the place of the substances removed others are commonly intro-



Liquorice Plant (*Glycyrrhiza glabra*).

duced, as sugar, flour, starch, and gelatine.—The most important proximate principles found in liquorice are: 1, glycyrrhizine or glycione, a glucoside ( $C_{44}H_{38}O_{18}$ , or  $C_{16}H_{12}O_6$ ), a transparent yellow substance, of a sweet taste, but distinct from sugar, scarcely soluble in cold but exceedingly so in boiling water, with which it gelatinizes on cooling; 2, a crystallizable principle identical with asparagine; 3, a brown acrid resin. Besides these, it contains starch, albumen, extract of gum, salts, &c. Glycyrrhizine is present, according to Dr. Hassall, in the fresh root, the undecorticated powder, and the decorticated powder, in the respective percentages of 8.60, 10.40, and 13.0, and the pure extract should contain 10 to 15 per cent. The commercial extracts vary more or less from this. Liquorice is used in medicine chiefly as a demulcent, especially in affections of the bronchial tubes, and also to

cover the taste of acrid or disagreeable substances, as seneca or hydrochlorate of ammonia. It is possible that the resin may have some therapeutic action in chronic bronchial affections. The decoction of the root, a solution of the extract, or the extract in substance, may be employed. The powder may be used to impart bulk and consistence to other drugs in making pills or lozenges.

**LISBON** (Port. *Lisboa*), a city and the chief seaport of Portugal, capital of the kingdom and of the province of Estremadura, on the right bank of the Tagus, about 9 m. from its mouth, 173 m. S. by W. of Oporto, 310 m. W. S. W. of Madrid, and 218 m. N. W. of Cadiz; lat. 38° 42' N., lon. 9° 8' W.; pop. in 1864, 224,063. The city is built on a series of hills, and rises in amphitheatre from

the river, viewed from which it presents, with its palaces, churches, and dazzling white houses, an aspect of magnificence surpassed by few other cities in the world. The streets in the old portion of the town (mostly hilly), where the ravages of the great earthquake were least extensive, are narrow, crooked, badly paved, and filthy; while those in the flat district, stretching from the Castello de São Jorge westward along the river, are spacious and well kept, and many of them cross each other at right angles. But in no part of Lisbon are now seen the hosts of mendicants, vagrant dogs, and mounds of dirt which formerly rendered the old streets so unhealthy for the inhabitants and insupportable to strangers. The houses in the old portions are with few exceptions wretched hovels, but those in



Lisbon, from the south bank of the Tagus.

the new are well built and extremely neat. The Necessidades palace, erected in the 18th century by King John V., has no architectural pretensions; but being situated on an eminence in the extreme west of the city, it commands a fine view of the river, and the gardens, with numerous fountains and aviaries, contain rare collections of botanical curiosities. The Ajuda palace, standing on a high hill behind the suburb of Belem, is a huge unfinished structure, in which the court receptions are usually held. Other royal residences are the palace of Belem and the Quinta de Cima, the ancient Bemposta, now used as a military school, and a new palace built in 1864. The sittings of the cortes are held in the old convent of São Bento, appropriated to that use in 1834. The cathedral, one of the most ancient edifices in Lisbon, was according to tradition once a mosque, and

in the 12th century converted into a temple by Alfonso I., who also rebuilt it, and appointed an English ecclesiastic the first bishop of the see. São Vicente de Fora, a church so named from its site outside the walls of the Saracen city, was founded by Alfonso I., and within its walls in a low dark chapel are entombed the sovereigns of the house of Bragança. The monastery adjoining this church was one of the largest in Lisbon; since 1773 it has been the residence of the patriarch, but its valuable library has not been removed. Near the cathedral stands the church of São Antonio da Sé, of rather small proportions, but with a rich interior decoration. The church of Nossa Senhora da Graça, rebuilt on one of the highest hills in 1556, is very conspicuous in all general views of the city. Of the numerous other churches, none deserve special mention except that of



Nossa Senhora dos Martyres, erected by Alfonso I. on the site of the crusaders' camp, and consequently the most ancient parish in Lisbon, the beautiful church of Santa Engracia, and that at São Roque. A large number of convents seated on the various hills, and mostly massive and imposing structures, present the appearance of palaces and fortresses. Among the other public buildings of importance are the Castello de São Jorge, on one of the highest eminences, which with the ground immediately surrounding it formed the original Moorish city; the military arsenal, in the easternmost district, on the banks of the river; the naval arsenal, adjoining the Largo do Pelourinho, and erected by Pombal after the earthquake; the custom house, on the east side of the Praça do Commercio; the exchange; the mint, with a coining machine worked by steam; the polytechnic institute, the architecture of which is chaste in style and admirable in execution; and above all, the grand aqueduct, constructed under John V., conveying water from springs some 10 m. N. W. of the city to the reservoir Mãi d'Agua, near the Praça do Rato. This magnificent structure crosses the valley of Alcantara upon a series of lofty arches, the maximum height of which is about 250 ft. Lisbon abounds in hospitals and charitable institutions; the most interesting of the former is São José, and of the latter the Real Casa Pia, now located in the convent of São Geronimo at Belem, for foundlings, orphans, and little wanderers. There are five theatres, a museum of natural history, and a botanic garden, three general cemeteries near the city for natives, and several smaller ones for foreigners. The English burial ground, called by the Portuguese Os Cyprestes, on the Estrella hill, contains the tombs of Fielding the novelist and Dr. Philip Doddridge. Adjoining the ground is a school for English children of both sexes whose parents are in straitened circumstances. The Limoeiro, now the principal prison, was formerly a palace. The only bridge worthy of mention is that over the small stream of Alcantara, on the road to Belem, with a beautiful statue of St. John Nepomuck, the patron of bridges, executed by the sculptor Padua. Near the bridge is a large collection of royal carriages. Among the scientific and learned societies may be mentioned the royal academy of sciences, founded in 1778; the society for the promotion of national industry; the society for the amelioration of the laboring classes; the royal marine academy, with its observatory; the military college; royal academy of artillery and engineers; school of music; the national library, with over 150,000 volumes; and the library of the cortes, with 30,000 volumes. The educational establishments comprise the royal schools of Vicente de Fora for philosophy, the sciences, and the ancient languages; the royal school of design and architecture; and a number of elementary schools, public and private. Besides the thea-

tres, there are several other places of amusement, such as the Circo dos Touros, for bull fights, constructed in 1831, with accommodation for an immense number of spectators, and a profusion of public gardens and promenades.—The port (or rather roadstead) of Lisbon is very spacious, offering excellent anchorage for whole fleets together, and is justly regarded as one of the finest in Europe. The entrance to the Tagus is defended by two forts, São Julião, and Bugio situated on the islet of Alcaçova, on which is also a lighthouse; and the bar at the mouth is the only one in Portugal which vessels can cross in all seasons and at all hours. Among the most ancient industries of the Lisbonese are those of the goldsmith and jeweller; while those of modern introduction include cotton and woollen spinning, and the manufacture of silk fabrics, sails, cordage, paper, chemicals, wax candles, and earthenware. Meats and fruits of various kinds are extensively preserved for export; there is a steam saw mill; and a spinning and weaving factory, some 7 m. from the city, on the opposite bank of the river, has recently achieved marked improvement in the manufacture of woollen and cotton stuffs. The imports mainly consist of cotton and woollen goods, anthracite coal, sugar, butter, raw metals, hides, and skins; the exports, of wine, olive oil, coffee, raw wax, bark, minerals (antimony, manganese, &c.), cotton fabrics, preserved meats and fruits, dried and green fruits, chemicals, and various other commodities. The total value of the exports in 1872 was \$8,145,526 (wine, \$1,335,376), and in 1873, \$8,024,619 (wine, \$1,836,680); of imports in 1872, \$12,072,443, and in 1873, \$12,497,728. The bank of Portugal, created in 1846, with a capital of about \$12,000,000, is the principal establishment of its kind in the kingdom. The wealthiest merchants are for the most part English; but there are many French, Germans, Dutch, and Italians. Lisbon is directly connected by rail with Oporto and other important cities in the kingdom, and with Madrid.—Nothing is definitely known of the date of the foundation of Lisbon, though some native historians gravely ascribe it to Ulysses, whence the early name Olisipo. Julius Cæsar bestowed upon it the rights of a *municipium*, and called it Felicitas Julia. The Alani, Vandals, and Suevi seized it in 409; and the Moors, who captured it in 711, named it Lishbuna, and held it till 1147, when it was wrested from them by Count Affonso Henriques (afterward king as Alfonso I.). Lisbon was made an archbishopric in 1390, and a patriarchate in 1716 by Clement XI. In 1433 the seat of government was transferred hither from Coimbra. It reached the zenith of its importance at the beginning of the 16th century under Emanuel the Great, when the Portuguese were distinguished above all other nations for their maritime discovery and commercial enterprise. From 1580 to 1640, under Spanish rule, it was a provincial

town; and the Spanish armada sailed hence in 1588. The most memorable event in the history of the city is the great earthquake of Nov. 1, 1755, by which about 40,000 persons lost their lives, and most of the city was destroyed. (See EARTHQUAKE, vol. vi., p. 360.) It has never fully recovered from this calamity, of which traces still remain in the desolated aspect of many vacant building sites. The city was occupied by the French in November, 1807, but delivered by the English in 1808, and protected by the duke of Wellington against the attacks of the enemy by the erection in 1809-'10 of formidable fortifications, extending from the Atlantic eastward to Torres Vedras (hence called the lines of Torres Vedras), and thence southeastward to Alhandra on the Tagus. On the occasion of the revolt of the troops against Dom Miguel, Aug. 21, 1831, some 300 persons lost their lives. The town was seized by Dom Pedro in July, 1833.

**L'ISLET**, a S. county of Quebec, Canada, bounded S. E. by Maine and N. W. by the St. Lawrence; area, 793 sq. m.; pop. in 1871, 13,517, of whom 13,375 were of French origin or descent. It is traversed by the Grand Trunk railway. Capital, St. Jean Port Joli.

**LISIEUX** (anc. *Noviomagus*), a city of Normandy, France, in the department of Calvados, 25 m. E. of Caen; pop. in 1866, 12,617. It is situated in a fine valley, watered by the small streams Orbec and Touques. The principal street, traversed by the highway from Caen to Evreux, is spacious and handsome; the rest of the town is composed of narrow and tortuous streets, and most of the houses are of wood and present a wretched appearance. The finest edifice is the cathedral, a Gothic building of the 12th century. The episcopal palace is a fine building with beautiful gardens. Most of the manufactures of the arrondissement of Lisieux, chiefly linen, woollen, cotton, ribbons, &c., are sold here, and there is also a brisk commerce in grain, fruits, cider, hemp, flax, cattle, and the other produce of the country.—Lisieux was anciently the capital of the Lexovii. It was pillaged by the Normans in 877, burned by the Bretons in 1130, taken by Philip Augustus in 1203, by the English in 1417, and by Henry IV. in 1590. It became early the see of a bishop, but the diocese was abolished in 1801.

**LISLE**. **I. Guillaume de**, a French geographer, born in Paris, Feb. 28, 1675, died Jan. 25, 1726. He was the son of Claude de Lisle, a geographer and historian of some note, and at the age of nine had constructed several charts of ancient history. He wholly reconstructed the system of geography current in Europe in 1700, by the publication of maps of the world, and of Europe, Asia, and Africa, in which he corrected many of the errors that had been copied with little alteration into all the works on geography since the time of Ptolemy. He also constructed a celestial and terrestrial globe. He was admitted to the

academy of sciences in 1702, and was afterward appointed tutor in geography to Louis XV., who created for him in 1718 the title of "first geographer to the king," with a pension of 1,200 livres. De Lisle drew up several maps for the use of his royal pupil, and the whole number made by him is said to amount to 134. In 1724 he published a corrected edition of his map of the world. He contributed several memoirs to the *Recueil de l'Académie des sciences*. **II. Joseph Nicolas**, a French astronomer, brother of the preceding, born in Paris, April 4, 1688, died there, Sept. 11, 1768. He first brought himself into notice in 1706 by an essay on an eclipse of the sun. In 1714 he was chosen a member of the French academy, and in 1724 visited England, where he was elected a fellow of the royal society. On the invitation of Catharine I. in 1726, he went to St. Petersburg, where he had charge of the observatory till 1747, when ill health obliged him to return to France. While in Russia he had made a collection of objects illustrative of geography and astronomy, which on his return was purchased by Louis XV., and De Lisle charged with the care of it. He also became a professor in the royal college of France.

**LISSA** (Polish *Leszno*), a town of Prussia, in the province and 42 m. S. S. W. of the city of Posen; pop. in 1871, 10,635, of whom more than one third were Jews. It has four churches, a synagogue, a normal school, a gymnasium, and a large number of manufactories. It was originally a family estate of the counts Leszczynski, with whom in the 16th century the persecuted Bohemian Brethren found a refuge. At the time of the thirty years' war Lissa was the chief seat of the Bohemian Brethren, who had here their most famous school, a seminary, and their archives.

**LISSA**, an Austrian island in the Adriatic sea, belonging to Dalmatia, 22 m. S. W. of Spalato; area, 38 sq. m.; pop. about 7,000. It has a strongly fortified war port. The Austrian admiral Tegetthoff obtained here, July 20, 1866, a great naval victory over the Italians under Admiral Persano.

**LIST**, **Friedrich**, a German political economist, born in Reutlingen, Aug. 6, 1789, died by his own hand in Kufstein, Nov. 30, 1846. He studied political economy, was for two years professor of this and kindred sciences at Tübingen, and officiated as agent of the German commercial union from 1819 to 1821, when he was elected to the Würtemberg chamber of deputies; but having attacked the government in a petition, he was prevented from taking his seat, and sentenced to ten months' imprisonment. After fruitless attempts to obtain pardon, and after several years' exile, he was eventually imprisoned in the fortress of Asperg, after which he emigrated to the United States, and settled in Pennsylvania. His "Outlines of a new System of Political Economy" was published in Philadelphia in 1827. He became an extensive holder of land, which he made avail-

able for cultivation in concert with other capitalists, and also took an active interest in the establishment of railroads. In 1830 he was appointed United States consul at Hamburg; but after a residence in Paris, he came back to Pennsylvania, and finally returned to Europe in 1832, and in 1833 took up his abode at Leipsic, where for some time he officiated as American consul. In 1837 he went to Paris, whence he wrote a series of letters to the Augsburg *Allgemeine Zeitung*, subsequently collected in a work, the first volume of which was published under the title of *Das nationale System der politischen Oekonomie* (Stuttgart, 1841). In 1843 he established at Augsburg the *Zollvereinsblatt*, in which he proposed the enlargement of the customs union, and the organization of a national commercial system and of a national fleet. In 1844 he visited Austria and Hungary, and in 1846 England with the view of forming a commercial alliance between that country and Germany. He was not successful, and, having lost his property and his health, shot himself. His works have been published with his biography by Häusser (3 vols., Stuttgart, 1850-'51).

**LISTER, Thomas Henry**, an English author, born about 1800, died in 1842. He was register general of births. He wrote two novels, "Granby" and "Herbert Lacy," and a "Life of Lord Clarendon, the Historian."—His widow, a sister of the earl of Clarendon, was in 1844 married to Sir George Cornwall Lewis. (See LEWIS.)

**LISTON, John**, an English actor, born in London in 1776, died March 22, 1846. He was educated at Dr. Barrow's school, Soho, and subsequently became second master in the grammar school of St. Martin's, Leicester square, founded by Archbishop Tenison. Having been expelled from this establishment for acting in plays with the large boys, he went upon the stage, and for several years appeared in provincial theatres with moderate success. His Diggory in "She Stoops to Conquer" first revealed his remarkable comic genius. In 1806 he obtained an engagement at the Haymarket theatre, and by his Gawkey in the "Chapter of Accidents" and Lord Grizzle in "Tom Thumb" established a reputation as one of the first low comedians of the day. In 1809 he attempted tragedy, with but moderate success. His famous character of Paul Pry, first performed in 1825, created an unusual sensation. Among his other principal characters were Mawworm, Tony Lumpkin, Bombastes Furioso, and Billy Lackaday in "Sweethearts and Wives." He retired from the stage about 1837. He was a man of exemplary character.—His wife, whose maiden name was Tyres, born in London about 1780, was almost a dwarf, but was for many years a favorite with the public in her acting as well as in her songs. Her best part was that of Queen Dolalolla in "Tom Thumb." She was married to Liston in 1807, and died Sept. 19, 1854.

**LISZT, Franz**, a Hungarian pianist and composer, born at Raiding, near Oedenburg, Oct. 22, 1811. At six years of age he manifested so extraordinary an aptitude for music, that his father, himself a musician of some repute, thenceforth carefully instructed him on the pianoforte. In his ninth year he performed at a public concert in Presburg at which were present several wealthy Hungarian noblemen. The latter, astonished at young Liszt's talents, at once proposed to contribute to his musical education during the next six years. In accordance with this proposition Liszt was taken by his father to Vienna and put under the instruction of Karl Czerny and Salieri, with whom he remained about 18 months, after which he appeared in concerts in Vienna, Munich, and elsewhere, with great success. At Paris, where he arrived in 1823, he received the most flattering attentions. Although rejected as a pupil by the conservatory on account of his foreign birth, he was carefully instructed in counterpoint by Reicha, and not a day passed in which he did not give many hours of practice to the works of Bach and other eminent composers for the pianoforte. When his education was considered finished, father and son made lucrative concert tours in the provinces and in England. Upon his return to Paris in 1825, Franz produced an opera in one act entitled *Don Sanche, ou le châteaueu de l'amour*, which only escaped condemnation on account of the youth of the composer. In 1827 he lost his father, an event which made a deep impression upon him, and under the influence of an unusually active imagination he surrendered himself to gloomy fancies and religious rhapsodies. An unhappy attachment to a woman of rank at the same time prompted him to retire from the world, and for several years he almost wholly relinquished his art. In this interval he embraced at different times the doctrines of the St. Simonians, the philosophy of Lamennais, and the vivid poetic fancies of Victor Hugo or George Sand. During the revolution of July, 1830, he composed a *Symphonie révolutionnaire*, which was never published. The appearance of Paganini in Paris in 1831 roused him from this mood, and, full of the idea of becoming the Paganini of the pianoforte, he resumed his practice on that instrument. In 1835 he heard of the success of Thalberg in Paris, and, after an interval of eight years, suddenly made his reappearance there with an éclat which his long absence had in no respect diminished. A contemporary critic, in enumerating the qualities which distinguished both pianists, observed: "Thalberg is the first, but Liszt is the only one." From Paris Liszt proceeded in 1837 to Italy, creating everywhere a sensation not less lively than that caused by Paganini. At Vienna he gave a series of concerts in aid of the sufferers by the great inundation of 1838 at Pesth; and at the solicitation of a deputation of Hungarian noblemen he subsequently visited the latter city, where he was

received with extraordinary enthusiasm, and was presented by the inhabitants with a sword of honor and the rights of citizenship. In 1839 an effort was made to raise by subscription a sum sufficient to erect a monument to Beethoven in Bonn, his birthplace. At the end of six months only 600 francs had been subscribed, when Liszt contributed the whole amount (about 60,000 francs) necessary for the completion of the monument, and it was inaugurated in August, 1845. From 1838 to 1847 his career was a succession of triumphs. In the latter year he retired to a small village in Germany, with the intention of devoting himself to a higher order of composition than the fantasias and other pianoforte pieces which he had previously produced. About this time he accepted an offer from the duke of Weimar to assume the post of conductor of the court concerts and the opera at Weimar. In this position he made Weimar one of the chief musical centres of Europe, and helped to introduce to notice several of the rising composers of Germany, notably Richard Wagner. With characteristic generosity he also afforded gratuitous instruction to young pianists, for whose benefit he gave private performances. During this period he produced his most important musical compositions. His *Faustsymphonie mit Chor*, *Gränermesse*, *Krönungsmesse*, and his oratorios *Die Heilige Elisabeth* and *Christus*, created a great sensation and gave rise to much criticism and discussion. In 1861 he went to Rome and became a great favorite of the pope. In 1865 he took ecclesiastical orders; and since that time he has been known as the abbé Liszt, and has devoted himself principally to the composition of church music. In 1870 he acted as leader of the Beethoven festival at Weimar, and afterward gave concerts for charitable and religious objects in Munich, Vienna, Pesth, and other cities. In 1871 he suddenly offered for sale his villa at Rome, and took up his residence in Pesth; and in 1874, the 50th year of his artistic career, he gave to the museum of Pesth his valuable collection of curiosities and works of art. As a performer Liszt stands at the head of what has been called the "prodigious" school, excelling in the production of difficult and novel effects. His fingering is firm, vigorous, and wonderfully flexible; but he labors under the imputation, not altogether unfounded, of sacrificing grace to strength, and of a desire to astonish rather than to charm by his playing. Bach, Handel, Beethoven, and the older composers have, however, had no more eloquent interpreter, notwithstanding he cannot always avoid substituting his own ideas for theirs. He has been an active contributor to musical literature, and is the author of a "Life of Chopin" (1852; English translation by Martha Walker Cook, 1863), of a work on "The Gypsies and their Music" (Paris, 1859), and of numerous articles in the *Neue Zeitschrift für Musik*. His *Theoretische und praktische Musik*, in 3 vols., is announced for

publication in 1875. He has been one of the most prolific composers of this generation. His works number several hundred, and belong to almost every department of the art. During the earlier parts of his career he was more conspicuous as an arranger of the ideas of others than as an original composer. He has made fantasias and improvisations on nearly all the popular Italian and German operas, and has transcribed for the piano a great number of German songs. His compositions for orchestra are numerous, and display boldness of treatment and variety of instrumental effect rather than originality or beauty of thought.

**LITCHFIELD**, the N. W. county of Connecticut, bordering on New York and Massachusetts; area, 885 sq. m.; pop. in 1870 48,727. It is watered by the Housatonic, Naugatuck, and Farmington rivers, with their branches, which supply extensive water power. The surface is uneven, in some parts mountainous, and the soil is good. Iron ore abounds, and is extensively manufactured. The Housatonic, the Naugatuck, and the Connecticut Western railroads pass through it. The chief productions in 1870 were 6,822 bushels of wheat, 50,444 of rye, 236,900 of Indian corn, 257,606 of oats, 27,561 of buckwheat, 319,497 of potatoes, 1,048,569 lbs. of tobacco, 51,759 of wool, 1,617,850 of butter, 1,307,396 of cheese, and 109,415 tons of hay. There were 6,076 horses, 22,514 milch cows, 6,482 working oxen, 17,477 other cattle, 17,824 sheep, and 7,232 swine. Of the numerous manufacturing establishments, the principal were 14 of agricultural implements, 9 of brass, brass ware, pins, &c., 41 of carriages, 3 of cotton goods, 10 of cutlery and edge tools, 12 of hardware, 2 of hats and caps, 20 of iron, 4 of machinery, 1 of needles, 6 of paper, 2 of plated ware, 1 of silk goods, 17 of tin, copper, and sheet-iron ware, 9 of woollen goods, 1 of worsted goods, 11 tanneries, 6 currying establishments, 31 flour mills, and 30 saw mills. Capital, Litchfield.

**LITCHFIELD**, the shire town of Litchfield co., Connecticut, situated between the Naugatuck river on the east and the Shepaug on the west, 30 m. W. of Hartford; pop. in 1870, 3,113. It contains five post villages, viz.: Bantam Falls, East Litchfield (on the Naugatuck railroad), Litchfield, Milton, and Northfield. The village of Litchfield is near the centre of the town, at the terminus of the Shepaug railroad, and occupies an elevated site noted for the beauty of its view. It is built chiefly on two streets, shaded with ancient elms and crossing each other at right angles; near the intersection of these are two parks, in the E. one of which a monument to the memory of citizens of the town who fell in the civil war has been erected. The village contains the court house, jail, a national and a savings bank, three hotels, several schools, a private lunatic asylum, two weekly newspapers, and four churches. It was the seat of a celebrated law school, established in 1784 and discontinued in 1838, and

of the first young ladies' seminary established in the United States. The village has become a favorite summer resort. Bantam lake on the S. border of the town is the largest in the state, and at Bantam Falls near its outlet, where there is good water power, several factories have been built.—The town was settled in 1720. In 1859 the town of Morris was taken from it, and in 1866 a portion was annexed to Torrington.

**LITCHI**, a Chinese edible fruit, which is occasionally to be found in the fruit stores of our seaport cities. It is produced by a small tree, *nephelium litchi*, belonging to the *sapindaceae*, the family which includes the horse chestnut, soap berry, &c.; the leaves are pinnate, and the small apetalous flowers are in panicles at the ends of the branches. The fruit, which is borne in clusters, is globular, about an inch and a half in diameter, and when fresh is filled with a sweet, white, nearly transparent, jelly-



Litchi.

like pulp, within which is a single seed. The Chinese are exceedingly fond of the pulp, and esteem the litchi above all other native fruits. The fruits come to us in the dried state only, but they are dried for home use as well as for exportation; as found in the stores, the very thin handsomely marked shell is of a reddish brown color, and partly empty from the shrinking of the pulp in drying, which tastes somewhat like prunes. Other species of *nephelium* furnish the longan and rambutan, fruits highly esteemed in China and neighboring countries; but the litchi is the only one imported.

**LITHARGE.** See LEAD.

**LITHGOW, William**, a Scottish traveller, born in the parish of Lanark in 1583, died there in 1640. He was of humble parentage, and as soon as he attained manhood commenced a pedestrian tour on the continent. After travelling in Germany, Bohemia, the Netherlands, Switzerland, and France, he proceeded

to Italy, then visited Greece, western Asia, and Egypt, and returned to England, bringing with him "certain rare gifts and notable relics" from Jordan and Jerusalem, which he presented to King James and the queen. Having remained a year in London, he set out for Africa, and traversed Morocco, Algiers, Tunis, and Tripoli, returning home through Hungary, Poland, and Germany. In 1619 he departed on a third tour, bearing recommendatory letters from King James to all kings, princes, and potentates. These documents however did not much avail him, for on arriving at Malaga in Spain he was arrested as a spy and subjected to torture; his limbs were mangled and crushed, and his body lacerated with tightened cords. Through the intervention of the British consul he at length obtained his liberty, and was conveyed to England in 1621, a helpless invalid. His condition was so deplorable that he had to be presented at court reclining on a feather bed. On recovering his health Lithgow was so imprudent as to assault the Spanish ambassador in the presence chamber, which consigned him for nine months to the Marshalsea prison. His latter days were passed in Scotland. The first edition of his "Adventures" was published in London in 1614, the latest in 1814. He was also the author of a history of the siege of Breda (1637).

**LITHIA** (Gr. λίθος, a stone), the oxide of the metal lithium, discovered by Arfwedson in 1817 in the mineral petalite, since found in lepidolite, spodumene, and in several varieties of mica and feldspar, also in tobacco and mineral waters; symbol  $\text{Li}_2\text{O}$ , chemical equivalent 30. It is an alkaline substance closely allied to potash and soda. It is separated by igniting the pulverized minerals that contain it with twice their weight of quicklime, treating first with hydrochloric and then with sulphuric acid. The sulphate of lithia, being soluble, is thus separated from the insoluble sulphate of lime, and is afterward decomposed by baryta water, the hydrate of lithia after filtration being recovered by evaporation; this fuses below redness; but as the alkali powerfully attacks platinum, the capsules employed should be of silver. Lithia forms several salts, which in general are remarkably fusible.

**LITHIUM**, a metal first obtained by Bunsen; symbol Li, chemical equivalent 7. (See LITHIA.) It is most easily reduced from the chloride by the galvanic current. It is a soft, ductile, white metal, susceptible of being welded and drawn into wire, but has less tenacity than lead. It fuses at  $356^\circ$ , and is not volatilized at a red heat. It is the lightest metal known, its specific gravity being only 0.5936. It burns brilliantly, floats upon water and naphtha, and soon abstracts oxygen, its behavior being like that of sodium. It was supposed to be a very rare substance, but Bunsen and Kirchoff have shown by spectrum analysis that, though sparingly, it is widely distributed.—Three salts of lithium, the carbonate, citrate, and bromide, are used in



medicine. Of these the first two are more powerfully diuretic than the corresponding salts of sodium or potassium, and from their low combining numbers a smaller dose suffices to render the urine alkaline. The compound formed by lithia with uric acid is very soluble, and these salts have accordingly been recommended and used in the treatment of gout (in which disease an excess of uric acid is found in the blood), being administered either in the form of an ordinary pharmaceutical solution or mixture, or as natural or artificial mineral waters. The action of the bromide of lithium is similar to that of the bromide of potassium, but is said to be effective in cases in which the latter fails.

**LITHOGRAPHY** (Gr. λίθος, a stone, and γραφειν, to write), a method of producing printed copies of a writing or drawing on stone without the usual process of engraving. It was invented about 1796-'8, in Munich, by Aloys Senefelder. As originally proposed by him, it was merely an etching in relief upon stone, a process which had long before been practised both upon stone and metal, although he was probably ignorant of the fact. As early as 1728 Dufay, a member of the French academy, described and practised a method of etching upon stone. He made a drawing with varnish, and used an acid to eat down the unprotected parts of the stone, leaving the lines in relief, and is said to have produced some exquisite work. About 1788 William Blake, the English painter, invented (or as he believed was spiritually taught) a similar process, only he used plates of copper, and in this manner produced his most famous works. Senefelder's use of stone was wholly accidental. Being, like Blake, too poor to pay for printing his works, he endeavored to devise some means of doing this himself from plates etched in relief, and to avoid expense he used smooth slabs of stone instead of plates of copper. Being ignorant of the composition of the varnish used by engravers for their etching ground, he invented a kind of crayon composed of wax and tallow. One day his mother wished him to write out a list of clothes to be sent to the laundress. Paper and ink not being at hand, he wrote the list upon a stone with his crayon. When he was about to clean off the stone it occurred to him, as it had to Dufay, that the body of the stone could be eaten down by aquafortis, leaving the lines in relief, so that impressions could be taken in the usual manner. His experiments in this direction were partially successful, although less so than those of Blake. In 1798 he thought of the availability of the chemical principle which is the foundation of the art of lithography properly so called, namely, the mutual repulsion between oily substances and water.—The material upon which the drawing is usually made is an argillaceous limestone. Stones more or less adapted for the purpose occur in various parts of Europe and America; but the best are found in the quarries of Solenhofen in Bavaria, and these are almost ex-

clusively used, being exported to all parts of the world where lithography is practised. The rock belongs to the upper oolite, is very closely grained, and is evidently formed from the finest sediments, the color varying from a light buff to a pearl gray. The stones, being quarried in mass, are split or sawn into slabs two or three inches in thickness and of any required size. To prepare them for use, they are ground to a perfectly uniform face and polished. If the drawing is to be in crayon, they are "grained" by rubbing two together, with the intervention of fine sand, the graining being finer or coarser according to the nature of the work to be produced. If the drawing is to be in ink, the surface is left polished. The crayons are composed mainly of tallow, wax, hard soap, and shell lac, colored with lamp black; other ingredients being sometimes added. The mixture is thoroughly incorporated in a closed vessel over a fire, and then moulded into the usual crayon form. Crayons, technically called "chalk," are required of different degrees of hardness; an increase of tallow makes them softer, of shell lac harder. With these crayons the drawing is made upon the stone precisely as upon paper. For pen-and-ink drawings a piece of the chalk is rubbed down with water upon a marble or porcelain slab, so as to form a liquid ink, which is applied with a fine pen or a camel's hair pencil. Both methods are frequently used in the same drawing, the fine strokes and sharp outlines being made with a pen, the coarser ones with crayons, while broad masses and tints are washed in with the pencil. But owing to the presence of the alkali of the soap, the chalk is soluble in water, and the drawing can be washed off with a moistened sponge. Diluted nitric or hydrochloric acid is therefore poured over the stone; the acid unites with and neutralizes the alkali, leaving the remainder of the chalk insoluble in water. The acid attacks the uncovered portions of the stone, rendering them more porous and more capable of absorbing water, and also eats it down, leaving the lines in slight relief, and thus facilitates the process of printing. The stone is next washed with pure water and afterward with gum water; the object of the latter is to prevent the coloring matter from spreading under the pressure to which the stone is to be subjected in printing, and to retain the acid that adheres to the greasy substance, the quality of which it is designed to change. Being then rolled over with printers' ink, it is ready for printing, although it is sometimes necessary to lay it aside for a day or two in order that the chalk may become thoroughly hardened. Sometimes the drawing is made upon transfer paper, which is merely paper coated on one side with a solution of gum, starch, and alum; thus the drawing is not directly upon the surface of the paper, but upon the preparation with which it is covered. The paper is then laid upon the stone, and

pressure being applied, the ink adheres to the stone, for which it has a strong affinity. The back of the paper being moistened, the gum is loosened, when the sheet is readily removed, and the remaining gum is washed off with water. The stone is then treated precisely as though the drawing had been originally made upon it. The transfer process is also used to multiply copies for printing of the original drawing, and also to produce copies of engravings to be printed lithographically. For this purpose an impression from the original plate is taken upon transfer paper in transfer ink, which is composed mainly of the same ingredients as the chalk, only reduced to a semi-fluid state by oil or some other liquid. The number of copies which can be taken from a single lithographic drawing varies greatly. A fine crayon drawing will give from 500 to 3,000 good impressions; an ink drawing about twice as many; while from drawings produced by the photolithographic process, described further on, as many as 30,000 have been obtained. It is customary to make one or more transfers, which can be substituted for the original drawing when worn out. Plates of metal, especially of zinc, are sometimes used instead of stone, and in the same manner; but stone is generally preferred. Stone is also frequently employed as a material upon which to engrave, in the same manner as upon a copper plate, only the lines are cut with a diamond point instead of a graver. For maps and plans this succeeds very well, the work being nearly as good, and the cost much less. Engraving upon stone, however, does not properly come under the head of lithography, the printing being performed as with copper plates, and not in the manner now to be described.—Lithographic printing is a process partly chemical and partly mechanical. The ink used is the ordinary printer's ink, composed essentially of linseed oil and lamp black, in a semi-fluid state, although other ingredients are usually added. (See Ink.) The lithographic hand press consists of a roller revolving upon its pivots in an upright frame, with a bed beneath it, moved back and forward by a winch. The stone is firmly secured upon the bed, and a moistened sponge is passed over it; the water is repelled from the greasy lines of the drawing, but wets the uncovered parts of the stone. The ink is applied by means of the usual printer's roller; it adheres to the greasy lines, and is repelled from the wet stone. The bed is then pulled under the roller, which is adjusted so as to give a heavy pressure. The ink is thus transferred to the paper, which also absorbs the moisture of the stone. These successive operations of wetting, inking, and pulling must be repeated for each impression. If the drawing is a large one, not more than 75 or 100 impressions a day can be taken upon the hand press; if the drawing is small, seven or eight times as many. Power presses have been constructed within a few years capable of work-

ing off 1,000 sheets an hour of any size. The principle, however, is the same as that of the hand press. The quality of the paper is a matter that requires attention. If it contain any gritty substances, it will soon act upon the stone; plaster in its composition soon causes the lines to be clogged; and alum attacks the gum and ruins the drawing. The printer should be able to appreciate the character of the work in hand, for upon his manner of applying the ink the general tone of the impressions may in great part depend. Their perfection is also in part due to the condition of the paper as to proper amount of moisture, and to the manner of regulating the press.—Lithography was introduced into Vienna in 1802, into Rome and London in 1807, and into Paris in 1814. Everywhere it met with great favor, and especially in Paris. Artists of distinction practised and aided to perfect it; and it was fashionable for the nobility to design on stone. Lemercier cultivated the art with the most distinguished and long continued success. He invented the autolithographic or transfer paper; and at the Paris exhibition of 1855 the medal of honor was awarded to Lemercier, who was then conducting a large establishment containing more than 100 presses and employing about 200 workmen. Count de Lasteyrie invented the method of facsimile printing, applicable to obtaining copies of characters that cannot easily be brought into ordinary typography, and also to maps in which all the details are lithographic, while the names of places are first produced upon the paper by ordinary printing. Engelmann by his knowledge of chemistry was able to give a great impulse to the art of lithographic printing in colors, or chromolithography. Full treatises upon lithography were published in 1819 by Count Raucourt and Senefelder. In England its productions have been of a high order, especially in landscapes; and the establishment of the Ackermans in London was long famous for the fine specimens it furnished in this department, including the productions of Hughe, Ward, Westall, Harding, Lane, and others. The art was introduced in America in 1821, and was practised by Messrs. Barnet and Doolittle in New York. There is a favorable notice of it, with some of the earliest specimens, in the "American Journal of Science" for 1822. For many years, owing to the want of artists, it made little progress here, except for commercial purposes and the production of cheap prints; but within the last few years many works of much merit, especially portraits, have been produced by Sarony and others.—CHROMO-LITHOGRAPHY is the art of producing by lithography works in which various colors are printed in a single picture. It is much used in various branches of ornamental work, and has been successfully employed in the production of pictures which are almost facsimiles of paintings and colored drawings. Each different color is printed separately, from a stone which contains only the

one color. Very frequently 10 or 15 separate stones are employed, and in some very elaborate prints as many as 30 or 40, some colors being printed over others to produce variations of tint and shading. In the first place a drawing is made which contains the general outlines of the position of the different colors. On the second and third stones the general effect of the drawing is worked in; these are printed in neutral colors, as a pearl gray or faint sepia. Each succeeding stone is charged with its own special tint, brown, blue, green, or yellow, as the case may be; and the last one contains the sharp dark touches, whether of shade or outline, which give character and expression to the whole. Upon the skill with which these colors are arranged, and upon the accuracy with which each falls exactly into its proper place, depend the value of the whole work. The misplacement of a single color to the extent of the fiftieth part of an inch might mar the whole. This involves the necessity of the utmost accuracy in the drawing upon each stone, and also in the placing of the paper in its exact place at each impression. The difficulty of this last is much increased by the fact that the sheet of paper must be dampened at each impression, whereby it expands perceptibly, and dried, when it contracts. If these successive dampenings be unequal, some of the colors will not fall in their right places. Finally, if an oil painting upon canvas is to be reproduced, an additional impression is given from a plate upon which are embossed lines representing the threads of the canvas. The print is then varnished or glazed, like an oil painting. Many "chromos" thus produced can hardly be distinguished from the original pictures from which they are copied. Chromolithography has been brought to great perfection in London, Paris, and Vienna. In the United States Mr. Louis Prang of Boston has within a few years executed many works not excelled by any produced in Europe. It is said that the first successful attempts to produce chromo-lithographic portraits, in which the effects of the painter were closely imitated, was made about 1860 by Mr. E. C. Middleton of Cincinnati, Ohio. He produced previous to 1866 a series entitled "Middleton's National Oil Portraits," several of which are admirable specimens of the art.—PHOTO-LITHOGRAPHY is the art of producing lithographic drawings by the action of light. About 1813 Joseph Nicéphore Niepce began his experiments for the production of permanent photographic pictures. These are the earliest on record, though not published till many years afterward. He used asphaltum as the substance sensitive to light, dissolving it in essential oil of lavender, and applying it as a thin varnish to metallic plates. After long exposure in the camera or under a cliché of some sort, the asphaltum became insoluble in the parts affected by light, and the picture was developed by dissolving away the unaffected portions. Undoubtedly Niepce had

in view not only the production of a picture, but also the subsequent etching of the surface supporting his photograph, so as to yield engraved plates from which copies could be printed in the press. In 1839 his method was superseded by that of Daguerre, with whom he had associated himself; but his discovery of the sensitiveness of asphaltum formed the basis of the first photo-lithographic process deserving the name. This invention was made by Lemercier, Barreswill, and Lerebours of Paris, and patented in France in 1852. They proceeded by making a solution of asphaltum in ether, coating a clean lithographic stone with this varnish, and exposing under a negative the dried surface so prepared. When the light had sufficiently acted through the transparent parts of the latter, the stone was washed with ether in abundance, whereby the unchanged and still soluble portions of the coating were removed, and the stone was gummed, rolled up with ink, and etched in the manner practised by lithographers. This invention was based essentially on the discovery that the altered mineral pitch had an affinity for the greasy ink on the lithographer's roller, and this was applied to the production of designs on stone. The process gave crude results; but it was the first of a series of six photo-lithographic methods, each of which must be regarded as typical, and therefore worthy of description in the present article.—M. Poitevin of Paris patented in December, 1855, a process for producing printable designs on stone. This was to a certain extent based on Mungo Ponton's original and fundamental discovery in 1839, that a sheet of paper sensitized with bichromate of potash applied in solution, and dried in the dark, was acted upon by light, giving a negative brownish picture, which, after exposure under an intercepting screen, resisted the solvent action of water. Becquerel had subsequently shown that the sizing of the paper played an important part in this phenomenon; but Poitevin in 1855 was the first to discover and utilize the remarkable property possessed by organic matter altered by the action of light in the presence of bichromate of potash, which forms the foundation of most of the photo-mechanical printing processes now in use; namely, that of repelling water and attracting greasy bodies, such as lithographic ink. To accomplish his purpose he coated the lithographic stone with a solution of bichromate of potash and albumen. After exposure under a negative, he applied moisture and ink followed by etching, in the manner practised by lithographers, thereby obtaining an inky picture on the parts exposed to light. This process is interesting, although the results were far from satisfactory, inasmuch as the printing took place, not from a picture on the stone itself, but separated from it by a film of altered organic matter; a circumstance which was not recognized by Poitevin, but was made use of many years later by Tessié du Motay, Albert,

Edwards, and others, in their collographic processes, which are of so much importance at the present day. Joseph Dixon, late of Jersey City, published the essential features of this process in 1854; but his experiments were of a somewhat incomplete nature, and not sufficient to displace the claims of Poitevin. Messrs. Cutting and Bradford of Boston, Mass., patented a photo-lithographic process in March, 1858. They sensitized the stone much as Poitevin did, using bichromate of potash, gum arabic, and a little sugar. They exposed it however under a transparent positive, and washing the stone with a solution of soap, succeeded in making those parts of it take the ink which were unacted on by light; the altered gum protecting the other places from the soap water. In this case the lithographic work was actually on or in the stone. A suitable etching removed the altered gum after rolling up.—M. Asser of Amsterdam was the first to suggest a transfer process. This invention was made early in 1859, but not published till November. His method consisted in sensitizing a sheet of unsized paper, or one slightly sized with starch, with bichromate of potash; exposing the same under a negative; washing the resulting print with water; drying and heating it strongly upon a hot plate; and finally again moistening and rolling up with transfer ink. The transfer sheet so prepared gave an inky positive picture, corresponding with greater or less fidelity to the lights and shades of the negative. After completion it was transferred to stone, which was then etched in the usual manner and printed. This process, like all the preceding, never gave results of commercial value.—J. W. Osborne, then of Melbourne, Australia, in August, 1859, invented the photo-lithographic process which bears his name. He prepares a sheet of paper by coating one side with a viscid solution, consisting of a mixture of albumen, gelatine, and bichromate of potash; this, after being dried in the dark, is exposed under a negative of the original to be reproduced. The photographic positive picture thus obtained is inked all over while dry by pulling it through the press face down, in contact with a lithographic stone to which an even coating of transfer ink has been applied. When the sheet is removed from the stone, the adhesive ink covers its surface, and nearly conceals the underlying photographic picture below it. This sheet is next placed floating on hot water, with the inked side upward; the moisture and heat together effect a coagulation of the albumen in the compound organic film, while the gelatine portion of the same gelatinizes and swells. The sheet is now lifted from the water, laid flat upon a slab, and friction applied to its inked surface by means of a wet sponge. The superfluous ink not needed to form the transferable picture is hereby removed; the sheet is flooded with abundance of warm water, dried, damped again slightly, and transferred to stone by simply inverting it

thereon and pulling it through the press in the usual way. When removed the ink on the surface of the transfer sheet will be found to have passed over to the stone, which is then rolled up and etched, after which it is ready for the printer. In this process the albumen plays an important part; its insolubility after coagulation prevents the undermining of the finer details by the solvent action of the water, and it also sticks the sheet to the surface of the stone during the operation of transferring, thereby preventing any shift and consequent doubling of the work. This process is chiefly adapted for copying line engravings, drawings, manuscripts, &c.; and this is also true of all analogous methods. It was adopted by the government of Victoria in September, 1859, for copying and publishing maps and plans; and since that time many thousand originals have been reproduced, being at present almost the only means employed there. This photo-lithographic process was the first which proved of real practical value. In 1865 the American photo-lithographic company of New York was organized, and has since worked this process with unvarying success. The drawings of the patent office for several years, and those of other governmental bureaus, have been executed by its means, whereby a great saving in cost and innumerable advantages in promptness and accuracy have been secured.—In August, 1861, Mr. Hannaford of London suggested a photo-lithographic method, which he never reduced to practice, but which M. Toovey of Brussels subsequently patented. Although this process has not come into general use, it must be regarded as essentially typical in its nature. Mr. Hannaford recommended the preparation of a sheet of paper with bichromate of potash and gum, its exposure under a negative, and its transfer while damp, without inking, to the stone. The consequence would be the passing over to the latter of more or less gum from the unexposed and unaltered parts, whereby the stone on such places would be incapacitated for receiving ink. If we now attempt to roll up the transferred surface with ink, we shall find the latter to adhere only to the clean parts of the stone, forming there the lithographic picture.—In addition to the six essentially different processes which have been described, there are numerous others based upon them, which it is unnecessary to particularize here.—As early as 1841 the late Mr. Joseph Dixon of Jersey City, and Mr. Lewis, a lithographer of Dublin, Ireland, each made attempts at the production of pictures on stone from which impressions could be printed. Mr. Dixon used bichromate and gum, much as Poitevin did. Mr. Lewis prepared a card surface with hard transparent ink, gave the same a thin coating of metallic silver, and then, proceeding as in the daguerreotype process, managed to expose certain portions of the underlying ink, which he then transferred to stone. The experiments of both these gentlemen were

exceedingly limited, and the evidence respecting them is derived from their own later statements only, no specimens or contemporaneous description being extant; but when we remember that the announcements of Fox Talbot's and Daguerre's inventions were only made two years before the date claimed by them, their assertions, which there is no reason to doubt, are of the highest interest.—In 1873 the Graphic company was formed in New York, for the purpose of conducting the business of photo-lithography on a large scale. They established a daily illustrated newspaper, "The Graphic," one side of which, containing four large pages, is printed in lithograph, the illustrations being produced by photo-lithography, and the other side from type in the usual manner. They profess to have made many improvements in the processes employed, the essential features of which they retain as a secret. By their processes they are able to produce upon stone a photo-lithographic copy of any engraving or drawing in less than half an hour, although two or three hours is the usual time.—At the present day photo-lithography is one of the necessities of civilization, and there are few cities of importance where it is not practised. Its results have done much to popularize the graphic arts, and to bring admirable copies of engravings, maps, and drawings within the reach of all. (See PHOTOGRAPHY.)

**LITHOLOGY.** See ROCKS.

**LITHOTOMY, and Lithotripsy.** See STONE.

**LITHUANIA** (Lith. *Letuva*; Pol. *Litwa*; Ger. *Lithauen*), a large tract of land in eastern Europe, which now belongs to the Russian empire, with the exception of a small part included in the East Prussian district of Gumbinnen, but which in the middle ages formed an independent state, and subsequently a great principality or grand duchy united with Poland. At the period of its greatest power in the 14th century it extended from the shores of the Baltic to those of the Black sea, and from the northern Bug to the Don. At the time of the first dismemberment of Poland, in 1772, it consisted of the palatinates of Wilna, Troki, Novogrodek, Brzesc (Brest), Vitebsk, Polock (Polotzk), and Mstislav, and the duchy of Samogitia; almost the whole of these territories is now included in the Russian governments of Wilna and Grodno, or Lithuania proper, Kovno, Vitebsk, Mohilev, Minsk, and Suwalki; area estimated at about 100,000 sq. m. Lithuania is generally a flat and low country, covered in great part with sand heaths, forests, marshes, and fens. The marshes of Pinsk, in the government of Minsk, are very extensive, and form a kind of dreary and gloomy desert. The principal rivers are the Niemen, Duna, Willa, Dnieper, Beresina, and Pripet, all of which abound in fish. The chief exportable productions are grains, flax, hemp, honey, timber, cattle, and horses. Among the wild animals are bears, wolves, elks, lynxes, wild hogs, foxes, and the aurochs

or European bison, which is now confined exclusively to the great forests in the government of Grodno. The climate is moderate and healthy. The inhabitants consist chiefly of Lithuanians proper, Poles, Russians, Tartars, and Jews.—Lithuania is first mentioned under this name about the beginning of the 11th century, when the inhabitants were little more than half savages living on the rude products of their extensive forests. They were long tributary to various neighboring Russian principalities, and, having recovered their independence, became involved in the 13th century in a long struggle with the knights sword-bearers, who established themselves on the shores of the Baltic, and in connection with the Teutonic order subdued and converted the kindred pagan tribes of the Prussians and others. Though inferior to their enemies in the art of war, the Lithuanians not only maintained their freedom, but also commenced a series of aggressive wars with their eastern neighbors, and rapidly grew in power. Rimgold appears as the first great prince or grand duke of the united country before the middle of the 13th century. His son Mindog received the royal diadem from the pope after having adopted the Christian religion, and was crowned at Novogrodek, but soon relapsed into paganism. Under Gedimin, in the earlier part of the 14th century, Lithuania became a powerful state by the conquest of Volhynia, the principalities of Kiev and Tchernigov, and others. His son and successor, Olgierd, even thrice appeared before the gates of Moscow. The son of the latter, Jagello, who married Hedvig, the daughter of King Louis of Hungary and Poland, becoming king of the latter country, united with it Lithuania, and converted his hereditary subjects to Christianity. Under Sigismund II. Augustus the two countries were still more closely united in 1569, though Lithuania retained separate armies, finances, and laws. (See POLAND.)—The Lithuanian language, a branch of the Lettic (see LETTIC RACE), is spoken in parts of East Prussia, in Samogitia, and in Lithuania proper. Its close affinity to the Sanskrit and relation to other languages have been established by Bohlen, Bopp, Schleicher, and others. The Latin form of writing was introduced with the religion of Rome. The vowels are the Italian *a, e, i*, (or *y*), *o, u*, the pronunciation of which is determined by the use of the three French accents (´, `), and *û* (*uo*). The consonants are: *b, c* (as in Polish, like *ts* in English), *ç* or *cz* (the Polish *cz*, Eng. *ch*), *d, g* (hard), *i* before vowels (Pol. *j*, Eng. *y* consonant), *k, l, ʃ* (resembling *rl*), *m, n, p, r, s, sz* (Eng. *sh*), *t, v* (Eng. *v*), *z* (as in English), *ż* (Eng. *j*). There is no letter *h*. A dropped nasal sound is marked by a little line in the vowels. Like the Slavic tongues and the Latin, the Lithuanian has no article, and three genders for nouns and adjectives. There are seven cases of declension, the same as in Polish: nominative,



genitive, dative, accusative, vocative, instrumental, and locative. The noun has five forms of declension, depending upon the termination and gender. The comparative degree is formed by *ensis* or *esne*, the superlative by *ausas* or *ausa*. The numerals are: *wienas* (Lat. *unus*), *du* (Lat. *duo*), *trys* (Lat. *tres*), *keturi* (Lat. *quatuor*, Pol. *cztery*), *penke* (Pol. *pięć*), *szessi* (Lat. *sex*, Pol. *sześć*), *septyni* (Lat. *septem*), *astūni* (Lat. *octo*), *dewyni* (Pol. *dziewięć*), *dessimti* (Pol. *dziesięć*, Lat. *decem*), &c. The pronouns resemble those of most Indo-European languages. The tenses of the verb are the present, imperfect, perfect, pluperfect, and future; it has conjunctive, factitive, inchoative, frequentative, and reciprocal forms, various participles, and a passive formed by auxiliaries. The language is rich in formatives and particles of every kind. Prepositions govern the cases of declension. Among the earlier grammars and dictionaries are those by Ruhig (1747) and Mielcke (1800), and the Polish-Latin-Lithuanian dictionary by the Jesuit Schyrnoid (died in 1631), whose sermons are the earliest extant work printed in the language. The most important works on the language are Schleicher's *Handbuch der litauischen Sprache* (2 vols., Prague, 1856-'7), his *Litauische Märchen*, &c. (Vienna, 1857), and his edition of the Lithuanian verses of Donaleitis (St. Petersburg, 1865). There is hardly any Lithuanian literature, the principal productions being popular songs, religious and liturgical hymns, riddles, and other poetry.

**LITMUS** (Ger. *Lackmus*), a blue coloring matter prepared from *rocella tinctoria* and related lichens. The various species of *rocella* are found upon the rocks of the coast of the Mediterranean and other warm countries; they are known in commerce as archil or orchella weed, and are designated by the names of the countries which produce them. (See ARCHIL.) They are used for dyeing, and when prepared by fermentation with potash or soda, they produce litmus. The lichen is macerated for several weeks in water, to which urine, lime, and potash have been added. Exposed to the air, the mixture undergoes a fermentation, becoming at first reddish, and ultimately blue. When the pulpy mass has assumed the proper blue color, it is pressed into a mould to form small rectangular cakes, plaster or clay being sometimes added to increase the bulk. As found in commerce, litmus is in small squares, light, friable, of the color of poor indigo, and of an odor that has been compared to that of violets. It consists of several peculiar coloring matters, together with the remains of lichens and such earthy substances as may have been added. The sole use of litmus is as a test for acids and alkalies, it being reddened upon contact with an acid, and the blue color being at once restored by an alkali.—Litmus paper is the form in which litmus is used as a test. To prepare this, a strong infusion of litmus is made with boiling water; this is divided into

two parts; dilute sulphuric acid is gradually added to one of these portions until it assumes a red color, after which the two portions of liquid are mixed. As from the manner of preparation litmus is likely to contain an excess of alkali, this method is adopted to render it as nearly neutral as may be, and thus increase its sensitiveness. Unsized paper is dipped into this infusion, and after it is dry cut in strips of convenient size and preserved in a stoppered bottle to prevent access of acid fumes. The paper thus prepared is a very sensitive test for acids. Another portion is prepared by adding acid to the blue infusion until it is red, and dipping paper in this; this is red litmus paper, and serves as a test for the presence of alkalies, which restores the normal blue color.

**LITTA, Pompeo**, count, an Italian historian, born in Milan, Sept. 27, 1781, died there, Aug. 17, 1852. Enlisting in 1804 as a common soldier, he attained a high position in the French army, which he left in 1814. Under the revolutionary government of Lombardy in 1848 he officiated for a short time as minister of war and commander of the national guard of Milan. He is the author of *Famiglie celebri italiane* (1819-'52), containing the history of upward of 50 eminent Italian families, a work renowned both for superb execution and historical accuracy. It was continued from his materials by Odorici and others.

**LITTLEDALE, Richard Frederick**, an Irish clergyman, born in Dublin, Sept. 14, 1833. He graduated at Trinity college, Dublin, in 1854, took orders in England in 1856, and was a curate in London till 1861, since which he has been occupied in writing. Among his works are: "Philosophy of Revivals" (1860); "Offices of the Holy Eastern Church" (1863); "Catholic Ritual in the Church of England" (1865); "Lecture on the Reformers" (1868); "Commentary on the Song of Songs" (1869); "Church Reform" (1870); "Pharisaic Protestantism" (1870); and "Church and Dissent" (1871). He has also edited St. Anselm's *Cur Deus Homo?* (1863), and "Primitive Liturgies in Greek and English" (1868-'9).

**LITTLE FALLS**, a town and village of Herkimer co., New York, on the Mohawk river, and on the Erie canal and New York Central railroad, 65 m. W. N. W. of Albany; pop. of the town in 1870, 5,612; of the village, 5,387. The village lies partly in the adjoining towns of Manheim and Danube, and is built in a narrow valley, with granite rocks rising on either side to the height of about 500 ft. The river here falls 42 ft. in three fourths of a mile, affording great water power, and the canal passes by a deep cut in the solid rock through a picturesque defile, 2 m. in length. The feeder of the canal crosses the river by an aqueduct, with an arch of 70 ft. span. The village has an extensive trade in cheese, and contains paper mills, woollen factories, flour mills, a cotton mill, manufactories of starch,

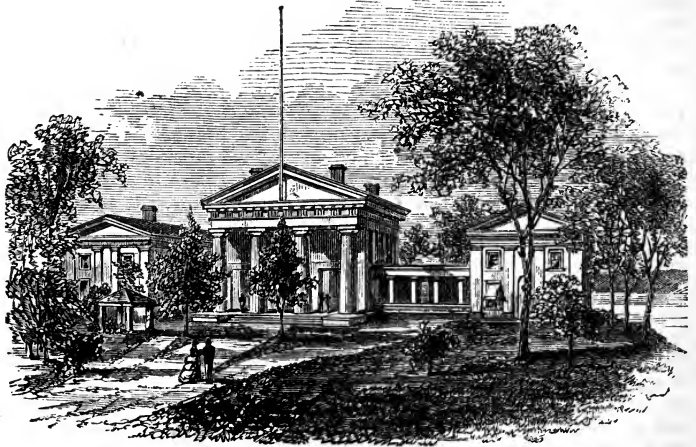
boots and shoes, axes, &c., a national bank, several public and private schools, two weekly newspapers, and a semi-monthly periodical.

**LITTLEJOHN, Abram Newkirk**, an American bishop, born in Montgomery co., N. Y., Dec. 13, 1824. He graduated at Union college in 1845, and was ordained deacon in the Protestant Episcopal church, March 18, 1848. He spent the first two years of his ministry in Amsterdam, N. Y., and Meriden, Conn.; was ordained priest Sept. 20, 1849, and became rector of Christ's church, Springfield, Mass., in February, 1850. In June of the following year he accepted the rectorship of St. Paul's church, New Haven, Conn.; was elected president of Hobart college, Geneva, N. Y., in 1858, but declined; and in the spring of 1860 became rector of the church of the Holy Trinity, Brooklyn, N. Y. Long Island having been

made a separate diocese in 1868, Dr. Littlejohn was chosen its first bishop, and was consecrated Jan. 27, 1869. He had also in November, 1868, been elected bishop of Central New York, but declined. During a period of seven years (1853-'60) he was lecturer on pastoral theology in the Berkeley divinity school, Middletown, Conn. In July, 1874, he was appointed by the presiding bishop to take charge of the American Episcopal churches on the continent of Europe. He has contributed largely to current literature, especially to the "Church Review," since 1853. In the winter of 1854 he delivered the first of a series of lectures on the "Evidences of Christianity," projected by Bishop Potter of Pennsylvania, taking for his subject "The Philosophy of Religion." He has published a number of charges, addresses, occasional sermons, &c.; and has in press (1874) a treatise "On the Causes, the Consequences, and the Remedies of the alleged Decline of the Influence of the Christian Priesthood."

**LITTLE RIVER**, a S. W. county of Arkansas, bordering on Texas and the Indian territory; area, about 500 sq. m.; pop. in 1870, 3,236, of whom 1,878 were colored. It lies between Little and Red rivers. The surface is diversified and the soil fertile. The chief productions in 1870 were 136,500 bushels of Indian corn and 4,966 bales of cotton. There were 892 horses, 598 mules and asses, 2,853 milch cows, 1,177 other cattle, and 4,899 swine. Capital, Rocky Comfort.

**LITTLE ROCK**, the capital and chief city of Arkansas, county seat of Pulaski co., situated near the centre of the state, on the S. bank of the Arkansas river, about 250 m. above its mouth, and 125 m. W. S. W. of Memphis, Tenn.; lat. 34° 40' N., lon. 92° 12' W.; pop. in 1850, 2,167; in 1860, 3,727; in 1870, 12,380, of whom 5,274 were colored; in 1874, estimated by local authorities at 20,000. It is built upon the first bed of rocks that is met with in ascending the Arkansas. Its elevation is not more than 40 or 50 ft.; but about 2 m. above the opposite bank of the river rises abruptly into a precipitous range of cliffs, 400 or 500 ft. high, known as the Big Rock. The name Little Rock is antithetical to this. The situation is dry and generally healthful. A brook, forming a considerable valley, flows through the city. The streets



State Capitol, Little Rock.

are wide, laid out at right angles with each other, and lighted with gas. The business houses are principally of brick, and the residences are surrounded by gardens adorned with shade trees and shrubbery, presenting a handsome appearance. The principal public buildings are the state house and St. John's college, of brick; several of the school houses and churches are handsome structures. Water works, to cost \$150,000, were in process of construction in 1874. Street cars accommodate local travel. The adjacent country is generally poor, except in the Arkansas bottom or lowlands. The river is navigable to this point at all times by steamers, and communication is furnished by the Cairo and Fulton, the Memphis and Little Rock, and the Little Rock and Fort Smith railroads. The Cairo and Fulton railroad has large passenger and freight depots, and this company is constructing an iron drawbridge across the Arkansas. The Arkansas Central railroad is in progress from Hele-

na, and the Little Rock, Pine Bluff, and New Orleans line toward the Louisiana boundary. The trade of Little Rock is extensive, and there are several important manufactories, embracing two of carriages and wagons, three of sash, doors, and blinds, two founderies, and two flouring mills. There are two national banks, with a capital of \$205,000, and a branch of the freedmen's savings bank and trust company. Little Rock is the seat of a United States arsenal and land office, of the state prison, and of the state institutions for deaf mutes and the blind. The United States courts for the E. district of Arkansas are held here. St. John's college (masonic), established in 1857, is essentially a military institute. It was discontinued during the civil war, and reopened in 1867. In 1872 it had 6 instructors and 102 students. St. Mary's academy for young ladies is under the charge of the sisters of the convent of mercy. The public schools embrace the various grades from primary to high school, and in 1872 had 23 teachers and 1,650 pupils. The mercantile library contains 1,800 volumes, and the state library 12,500. Three daily and three weekly newspapers and one monthly periodical are published. There are nine churches, viz.: Baptist (two), Christian, Episcopal, Lutheran, Methodist (two), Presbyterian, and Roman Catholic.—Little Rock was founded about 1820, and in that year became the seat of the territorial government. During the civil war it was in the possession of the confederates until Sept. 10, 1863, when it was captured by Gen. Steele.

**LITTLETON**, or *Lyttelton*, Sir Thomas, an English jurist, born in Devonshire early in the 15th century, died at Frankley, Worcestershire, Aug. 23, 1481. His father's name was Westcote, but he substituted for it that of his maternal grandfather. He most probably received his collegiate education at Cambridge, whence he afterward removed to the Inner Temple, where he was nominated reader of law lectures. Henry VI. made him steward (or judge of the court of the palace or Marshalsea) of the king's household, and on May 13, 1455, a king's sergeant, in which capacity he rode the northern circuit as judge of assize. On the deposition of Henry, his successor Edward IV. confirmed to Littleton all the offices and honors he had received from the Lancastrians. In 1466 he was appointed one of the judges of the court of common pleas. His famous treatise on "Tenures," originally written in Norman French, and translated into English in 1539, from the great changes in the law of real property, no longer receives as much attention as formerly. It is usually accompanied in modern editions by the commentary of Sir Edward Coke.

**LITTORALE**, or properly *Litorale* (Lat. and Ital., belonging to the seashore; Ger. *Küstenland*), a province of the Austro-Hungarian monarchy, situated on the N. shores of the Adriatic sea and including the neighboring

islands, comprising the counties of Görz and Gradisca, the margraviate of Istria, and the district of Trieste; area, 3,085 sq. m.; pop. in 1870, 600,525. The name was formerly applied to two strips of land on the northern shores of the Adriatic sea, of which the eastern, or the Hungarian Littorale, has often figured in Austrian history. It originally belonged to the Croatian military district, was converted into a civil district of Hungary by Maria Theresa, formed a part of the French province of Illyria under Napoleon, was retaken by Austria in 1814, reannexed to Hungary in 1823, occupied by Jellachich, ban of Croatia, in 1848, and attached to that province by Francis Joseph in 1849. Its principal places are Buccari and Porto Re, Fiume having been reincorporated with Hungary.

**LITTRÉ**, *Maximilien Paul Émile*, a French philologist, born in Paris, Feb. 1, 1801. He was educated for the profession of medicine, but his attention has always been given chiefly to philosophical and literary pursuits. After the revolution of July, 1830, he became one of the contributors to the *National* newspaper, the organ of the democratic party, his connection with which lasted until its suppression in 1851. He wrote a number of papers for the *Dictionnaire de médecine*, among which is an important article on Asiatic cholera. In 1837, in concert with Dezeimeris, he established a medical and surgical journal, and at the same time was employed in editing and translating the works of Hippocrates. The first volume appeared in 1839, and procured his admission to the academy of inscriptions. The 10th and last volume was published in 1861. In 1839-'40 he published a translation of Strauss's "Life of Jesus." He became a prominent promoter of the doctrines of Auguste Comte, of which he gave a clear synopsis in his work *De la philosophie positive* (Paris, 1845), and which he has defended and elucidated in a series of pamphlets. In 1844 he had been appointed by his colleagues of the institute successor to Fauriel for continuing the *Histoire littéraire de la France*, to the 21st, 22d, and 23d volumes of which he made important contributions. In 1848 he mingled actively in politics, and held the honorary office of municipal councillor of Paris, and in 1849 published *Application de la philosophie positive au gouvernement des sociétés, et en particulier à la crise actuelle*. In 1854 he was appointed editor of the *Journal des Savants*. In 1863 he was a candidate for admission to the French academy, but was rejected on account of his irreligious opinions. In January, 1871, he was appointed by Gambetta professor of history and geography in the polytechnic school. In February he was elected to the national assembly as one of the representatives of the department of the Seine, and was chosen vice president. On Dec. 30 he was chosen a member of the academy in place of M. Villemain, in consequence of which Bishop Dupanloup, who

had strenuously opposed his election, resigned. In the assembly M. Littré generally acted with the left. In 1863 he commenced the publication of his *Dictionnaire de la langue française*, and finished it in 1873 (4 vols. 4to). Its composition occupied a large portion of his time for nearly 30 years, and it is generally regarded as superior to any similar work in the French language. Among his other works are a translation of Pliny's "Natural History," which appeared in Nisard's *Collection des classiques latins* (1848); *Conservation, révolution et positivisme* (1852); *Sur la mort de M. Auguste Comte* (1857); *Paroles de philosophie positive* (1859); *Médecine et médecins* (1872); and *La science sous le point de vue philosophique* (1873).

**LITROW, Joseph Johann von**, a German astronomer, born at Bischof-Teinitz, Bohemia, March 13, 1781, died in Vienna, Nov. 30, 1840. He studied at Prague, and in 1807 became professor of astronomy at Cracow. The war of 1809 caused a dissolution of the university there, and Litrow accepted an appointment in that of Kazan. In 1816 he became assistant superintendent of the observatory on the Blocksberg in Buda, and some years later professor of astronomy in the university of Vienna and director of the observatory there, the excellence of which is chiefly due to his exertions. He wrote many valuable works on astronomy.—His eldest son, KARL LUDWIG, was his assistant from 1831, and after his death succeeded him as director of the observatory.

**LITURGY** (Gr. *λεiturγία*, a public act or service), in general, the totality of the prayers and ceremonies which are used by a church for the celebration of divine worship. More commonly, however, it is taken in a narrower sense, and denotes those formularies or books which contain these prayers and ceremonies. Those who administered the liturgy were called in the ancient church *λειτουργοί*, a term which denoted in Athens the managers of public spectacles, but in later times came to be used exclusively in an ecclesiastical sense. Moses established days for public worship, various sacrificial rites, and forms of words to be used on specified occasions. This national order of public worship was made more pompous under Solomon, and afterward it became customary to accompany the offering of sacrifices with psalmody. In these forms Christ and his apostles joined. He also left one form of prayer which has been in universal use among Christians, and the rites of the Lord's supper and baptism, which have been all but universal. I. **PSALMODIC LITURGIES**. It appears well established that the first Christians met at certain hours to pray and sing psalms. The Septuagint version of the Psalms was used for this purpose in the Greek churches, and the old Italic version in the Latin till St. Jerome, by order of Pope Damasus, corrected at first the Italic version, and afterward translated the psalms from the Hebrew and arranged them in a suitable order for the divine office. This psalter

was introduced throughout the West. Pope Gelasius added hymns to it; and by degrees lessons from the Old and New Testaments, commentaries from the church fathers, and the acts of the local martyrologies relating to the saints commemorated on each day, became a part of the psalmodic office. Thus grew up the long liturgy of the East, and what in an abridged form became the breviary of the western churches. (See **BREVIARY**.) An important part of this office was the litany (Gr. *λιτανεία*, supplication), which consisted at first in the deacon's reciting from the ambon the most important objects of supplication, to each of which the congregation responded "Lord, have mercy," "Christ, have mercy," "Hear us, Lord," "Help us, Lord," &c. These successive appeals to the persons of the Trinity were known as the lesser litanies; but gradually, after the 4th century, these responsive forms were lengthened, became usual in solemn processions, and were then called the "greater litanies." The sacramental offices or liturgies were distinguished in the beginning by a few simple forms, still underlying the diversity and multiplicity of rites gradually superadded. The primitive forms relating to baptism and the Lord's supper especially have been preserved without alteration. They were carefully handed down unwritten from generation to generation till the age of Constantine, when sacramentaries or liturgical formularies were published, containing the whole order of divine service. II. **EUCCHARISTIC LITURGIES**. As in the sacramental system the eucharist or Lord's supper occupied a central position, the term liturgy began to be applied chiefly or exclusively to its celebration. The eastern eucharistic liturgies are usually classed into four groups: 1. The "liturgy of the apostles," sketched in the 8th book of the apostolic constitutions attributed to St. Clement, in general use during the first four centuries, and which served as a groundwork for subsequent rituals. 2. The liturgy of St. James the Elder, used in the patriarchal churches of Jerusalem, Antioch, and their dependencies. The Greek version of it was successively corrected and amplified by St. Basil the Great and St. John Chrysostom. This version was introduced into the church of Constantinople in the 6th century, and has ever since continued to be used there. It is the original of the Slavie liturgy of St. Cyril, which became the liturgy of the Russo-Greek church and its offshoots. The Syriac liturgy of St. James in use at Antioch is considered to be a free version. Modified to suit the Monophysite doctrines, it has been everywhere one of the favorite liturgical forms of the Jacobite churches. Modified to suit the opposite Nestorian tenets, it has always been used by the Nestorian churches of Armenia, Mesopotamia, Persia, and the East Indies. 3. The Alexandrian liturgy, attributed to St. Mark, received its complete form from St. Cyril of Alexandria. He permitted it to be

translated into Coptic and used by the Coptic churches throughout Egypt. It was also translated into the Ethiopic, and has always been used by the Abyssinian churches. The Monophysites employ no fewer than 28 different liturgical forms, each named after some apostle or saint. 4. The liturgy of St. John the Apostle, or Ephesian liturgy, though superseded in the East by that of St. James after the 4th century, appears to have been introduced into southern Gaul by St. Irenæus and St. Pothinus, and to have served as the prototype of the early rituals of Gaul, Spain, Great Britain, and Ireland.—The Roman liturgy, ascribed by Catholics to St. Peter, was in use throughout Italy till after the age of Constantine. It was embodied in the sacramentaries of St. Leo the Great, St. Gelasius, and St. Gregory the Great. The most remarkable innovation of the Gregorian liturgy was the establishment of an ecclesiastical chant which helped toward the general adoption of the whole Gregorian liturgy by the western churches. The Roman sacramentary received at an early date the name of missal or mass book, and contained at first only what the officiating bishop or priest recited or sang at the altar, namely, the canon with the prefaces and collects. To these were afterward added what was sung in the choir; and finally, in the 9th century, appeared the complete or “plenary missal,” containing, with the above additions, the lessons, epistles, and gospels, or what belonged to the office of lectors, subdeacons, and deacons. In this form the Roman liturgy continued to exist till the council of Trent appointed a commission to revise it. This revision was promulgated as the “Roman Missal” by Pius V. in 1570, and was further corrected by Clement VIII. and Urban VIII. The Milanese or Ambrosian liturgy was never superseded by the Gregorian, and was formally sanctioned as the “Ambrosian rite” by Alexander VI.—The Mozarabic and Gallican liturgies have already been alluded to as offshoots of the Ephesian liturgy of St. John. The former, supposed to have been named from its being adopted by the mixed population of Goths and Arabs in Spain (*Mixti-Arabs*), was introduced in the 6th century. It began to be replaced by the Gregorian ritual in the 11th century, and in the 16th its use was limited to a single chapel in the cathedral of Toledo. In Gaul special sacramentaries were composed by St. Hilary of Poitiers (died about 368), by Musæus, a priest of Marseilles, and by Sidonius Apollinaris, bishop of Clermont (died about 484). That of the church of Lyons, claiming St. Irenæus for its author, subsisted till quite recently, when it was superseded by the Roman missal and breviary. The rituals in use in the various dioceses of France before 1789 were the work of the respective bishops. The Roman court protested against their introduction. The last of them gave way in the diocese of Paris to the Roman liturgy in

1874. St. Augustin on his arrival in Britain found such liturgical diversity among the Saxons, that he was advised by St. Gregory the Great to allow the local churches to adopt either the Gallican or the Roman ritual, or such portions of them as best suited established customs. The Norman bishops after the conquest made strenuous efforts to introduce uniformity. Thence came the Salisbury liturgy, or “use of Sarum,” which did not differ substantially from the Gregorian rite, and which became general in Ireland, and was adopted in many places on the continent. Many local customs or “uses” subsisted in England till the reformation. III. PROTESTANT LITURGIES. A complete history of the liturgy of the church of England and of the Protestant Episcopal church of America is given under the title COMMON PRAYER, BOOK OF. Of the Protestant liturgies, the first in chronological order was Luther's *Taufbüchlein*, published at Wittenberg in 1523, followed by *Formula Missæ et Communio* in 1524, a hymn book entitled *Enchiridion*, and his *Deutsche Messe* in 1526. Luther wished to introduce as few changes as possible; he made the Lord's supper the central part of his liturgy, gave a more prominent part to preaching, and retained the church music. Of the churches reformed through his instrumentality, some adhered to the Wittenberg order of service, while others adopted the simpler forms of Zwingli and Calvin. However, in northern, eastern, and middle Germany this Lutheran ritual has been always maintained. In the Scandinavian kingdoms and Iceland, the preservation of the episcopal office contributed to that of the old liturgy in its main features. Although no one form of public worship is obligatory among Lutherans, as in the church of England, the conservative portion of them were strongly attached to the old forms, while the progress of liberal and rationalistic ideas inclined the remainder to a ritual more adapted to their wants. The Prussian government published in 1822 the union liturgy, made obligatory both on Lutherans and Reformed in Prussia, and aiming at uniting them in one evangelical state church. This measure, as well as others subsequently taken in the same direction, led to a wide-spread resistance, which ended in the formation of the “Separated Lutheran” churches. These were granted a legal status in 1845, and are governed by a high consistory of their own, and preserve the old liturgy of their fathers.—The Moravian liturgy, preserved in the works of Bishop Amos Comenius, and published in 1632, served as a basis for the present ritual of the United Brethren, which was compiled by Count Zinzendorf from the Greek and Latin services. This liturgy comprises the orders for the Lord's supper, baptism, betrothal and marriage, confirmation, ordination, and burial. There are litanies for Sunday morning service, and a choral office with music. (See “Liturgy and Hymns for the Use of the Protestant Church



of the United Brethren," London, 1849.)—The liturgy of Calvin differs much from that of Luther. There is no responsive portion, but there are offices for the Lord's supper, and for baptism and marriage. The liturgy of Geneva is moulded on that of Calvin; and the churches of continental Europe in sympathy with the Calvinistic system have rituals closely resembling the Genevese. The church of Scotland received her order of divine worship from Knox, who drew it up at Frankfort, tried it at Geneva, and made it obligatory in Scotland in 1564. The "New Book of Scotland," published in 1644, combined the main features of the liturgies of Calvin and Knox. The only guide for the Presbyterian order of worship is the Westminster "Directory for the Public Worship of God." Some Congregational and Baptist churches have adopted written forms for the administration of baptism and the Lord's supper, and for marriage and burial services. The Swedenborgians (New Jerusalem church) admit the Lord's prayer as the one fixed form, and with it they have a choral and responsive service, including the psalms of David recited or sung to old Gregorian music, and separate services for the sacraments and special occasions. Unitarianism, having no priestly order, nor indispensable, saving sacraments, has no established liturgy. In most Unitarian congregations there is a communion service, whose efficacy is believed to consist principally in fostering religious feeling. The ordinary services are very simple, consisting of prayer, preaching, and singing; and an afternoon service is now adopted by some congregations, in which choral music is used with much effect.—See Muratori, *Liturgia Romana Vetus* (2 vols., Venice, 1748); Assemani, *Codex Liturgicus Ecclesie Universalis* (13 vols., Rome, 1749-'66); the Lutheran Daniel, *Codex Liturgicus Ecclesie Universalis* (4 vols., Leipzig, 1847-'54); Mone, *Lateinische und Griechische Messen aus dem 2ten bis 6ten Jahrhundert* (Frankfort, 1850); Neale, "The Liturgies of St. Mark, St. James, St. Clement, St. Chrysostom, and St. Basil" (fol., London, 1859); and "Liturgies and other Documents of the Ante-Nicene Period" (Edinburgh, 1872).

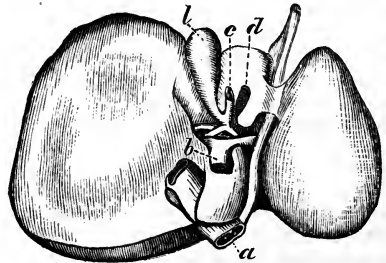
**LIU KIU.** See Loo Choo.

**LUTPRAND.** See LUITPRAND.

**LIVADIA,** or *Levadea* (anc. *Lebadea*), a town of Greece, capital of an eparchy of the same name in the nomarchy of Attica and Beotia, situated on the Hercyna, 52 m. N. W. of Athens; pop. about 5,000. It was formerly the most flourishing town of northern Greece, and was the capital of the Turkish province of Livadia, which included all of modern Greece N. of the isthmus of Corinth; but it was nearly destroyed during the war of independence. It was famous in antiquity as the site of the cave of Trophonius and of the springs of Lethe and Mnemosyne. Cotton is raised in the surrounding country, and there are several cotton gins in the town, imported from England.

**LIVE OAK,** a S. county of Texas, intersected by the Rio Nueces; area, 1,200 sq. m.; pop. in 1870, 852, of whom 28 were colored. There is considerable tillable land in the valleys of the streams, but it is best adapted to stock raising. Rains are infrequent in summer. In 1870 there were 5,010 horses, 611 milch cows, 62,177 other cattle, 5,204 sheep, and 681 swine. Capital, Oakville.

**LIVER,** an organ characterized by the presence of cells secreting bile, and found in some form or other throughout almost the whole animal series. These cells may be scattered over the intestinal canal, restricted within its follicles, contained in elongated branching tubes or cæca, or collected in loosely lobulated masses, as in invertebrates; or they may be clustered together in lobules and consolidated into a firm and compact organ, as in man and other vertebrates. The liver in man occupies the right hypochondriac and epigastric regions, extending partly into the left hypochondrium, below the diaphragm; it is above the stomach, duodenum, arch of the colon, gall bladder, and right kidney, and in front of the aorta and

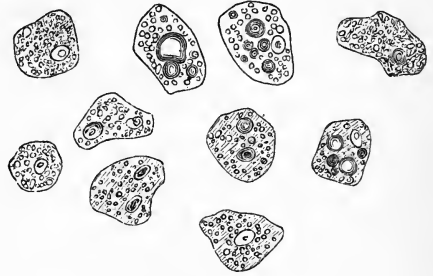


The Liver viewed from below.—a, vena cava; b, vena portæ; c, bile duct; d, hepatic artery; l, gall bladder.

lower vena cava. Its size is large, and its normal weight from 3 to 4 lbs.; its form is irregular, being elongated transversely, flattened from above downward, very thick behind and thin in front; its tissue is dense and of a reddish brown color. The upper surface is convex, in contact with the diaphragm, and divided by the suspensory ligament or fold of peritoneum into two unequal parts, of which the right lobe is considerably larger than the left. The lower surface is irregularly concave, presenting from left to right a superficial depression corresponding to the upper wall of the stomach; the antero-posterior or longitudinal fissure, which lodges in the fetus the umbilical vein and the *ductus venosus*, shrunk into mere fibrous cords in the adult; the transverse fissure, at right angles to the preceding, in which are situated the vena portæ, the hepatic artery and biliary duct, and numerous nervous filaments and lymphatic vessels; the short fissure for the vena cava, near the posterior border; the small lobe of Spigelius, an irregularly triangular portion behind the transverse fissure; the *lobus quadratus*, in front of the

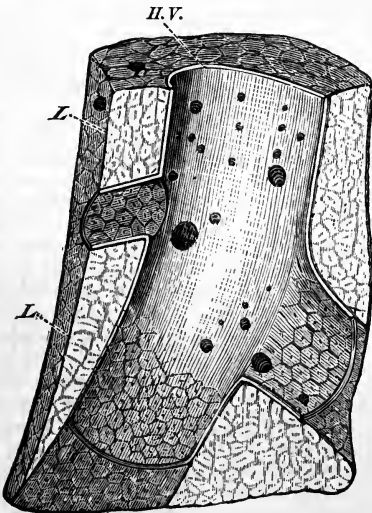
transverse fissure, the gall bladder lying between it and the right lobe; and on the right lobe, depressions corresponding to the right portion of the transverse colon, and to the right kidney and supra-renal capsule. In the carnivora and rodents, portions of the liver rudimentary in man are highly developed; in these there are five distinct parts, a central or principal lobe, and a right and left lateral lobe, each with a lobular appendage. The liver is in great part covered with a shining peritoneal or serous envelope; an investment of areolar tissue also is spread over the organ, extending into the interior, and forming thin but dense sheaths to the vessels and canals, called the capsule of Glisson.—The blood vessels of the liver are the hepatic artery and veins and the vena portæ; in the fœtus the maternal blood is brought to the liver by the umbilical vein; the lymphatics are numerous, and the nervous filaments are supplied from the pneumogastric nerve and the hepatic plexus of the sympathetic. The proper tissue of the liver is composed of a great number of polygonal masses, about  $\frac{1}{12}$  or  $\frac{1}{16}$  of an inch in diameter, generally called lobules or *acini*, of a foliated appearance from the branching distribution of the hepatic veins in the centre of each; in the spaces left between the polygonal lobules lie the branches of the vena portæ, hepatic artery, and duct, each lobule giving the characteristic structure of the organ. The vena por-

come lobular veins, their terminal branches ending in the intralobular or hepatic vein. The hepatic artery, a branch of the great cœliac axis from the aorta, sends its branches to all parts of the organ, supplying the walls of



Glandular Cells from the Human Liver.

the vessels and ducts, and the lobules through the interlobular spaces. The lobules or acini are made up of a great number of minute glandular cells, the "liver cells;" transparent rounded or polygonal bodies,  $\frac{1}{12}$  to  $\frac{1}{16}$  of an inch in diameter, slightly granular in texture, and each one containing a round or oval nucleus and nucleolus. These cells often contain granules of yellow coloring matter, and one, two, or three oil globules of various sizes.—An abundance of minute capillary blood vessels penetrate into the substance of the lobule, ramify around and among the liver cells, and thus bring the blood into intimate relation with the glandular tissue of the organ. The blood coming from the alimentary canal by the portal vein reaches the hepatic vein only after having passed through the capillary circulation of the liver itself; and it is during this passage that various important changes take place having for their object partly the modification of the blood itself, and partly the production of new substances in the tissue of the liver. In the first place, the blood, in passing through the liver, loses a great portion of its fibrine (a fact fully established by the observations of Simon, Lehmann, Bernard, and Brown-Séquard), so that the blood drawn from the hepatic vein always has less fibrine than that taken from the portal vein, and sometimes has so completely disappeared that the hepatic blood will not coagulate at all. What becomes of this fibrine is not positively known; but it is doubtless transformed into some other substance, required either for the nutrition of the liver itself, or for use in some other part of the circulation. Secondly, a kind of animal sugar is formed in the substance of the liver, and this independently of any vegetable or saccharine materials taken with the food. This sugar appears first in the solid substance of the hepatic tissue, where it exists on an average, at the moment of death, in the proportion of at least  $2\frac{1}{2}$  parts in 1,000. The sugar, however, is not formed directly from the



A Section of part of the Liver to show the hepatic vein (H.V.), with the lobules or acini (L.) of the liver, seated upon its walls, and sending their intralobular veins into it.

tæ, which receives the venous blood from the digestive organs, divides and subdivides in the liver like an artery, till it reaches the interlobular spaces, forming a freely anastomosing network throughout the organ, and constituting the intralobular veins; after ramifying on the capsules they enter the lobules and be-

albuminous ingredients of the liver tissue, but is produced by the catalytic transformation of a peculiar substance termed "glycogene," which is itself produced in the hepatic tissue and afterward converted into sugar by a kind of fermentation. Thirdly, certain ingredients of the bile, such as cholesterine, and the various mineral salts, already existing in the blood, are separated from it by the action of the liver, and exuded, together with the watery parts of the secretion, into the biliary ducts, there to take part in the constitution of the bile. Fourthly, there are other ingredients of the bile, and these the most important ones, such as the tauro-cholate and glyco-cholate of soda, which do not preëxist in the blood, but are formed by the liver itself, in the substance of its glandular tissue. Thence they are exuded, with the other constituent parts of the biliary fluid accumulated in the bile ducts, and are either at once discharged into the intestine, or stored up in the gall bladder for subsequent use. The bile is collected from the glandular tissue of the liver by a great number of minute biliary ducts, which converge in such a way as to form larger and larger branches. Two of these main branches, coming one from the right, the other from the left lobe of the liver, emerge into the great transverse fissure of the organ, and there unite to form a single duct known as the "hepatic duct." The hepatic duct descends for about two inches toward the small intestine, when it is joined at an acute angle by another duct coming from the gall bladder, and termed the "cystic duct." The main canal formed by the union of the two, and called the "common biliary duct," then pursues its course, and penetrating obliquely the walls of the duodenum, or upper portion of the small intestine, terminates by a rounded orifice upon the internal surface of the duodenum, about four inches below the pyloric extremity of the stomach.—The liver is an organ which is continuously active, discharging its secretion during the intervals of digestion, as well as while that process is going on. Its activity, however, according to the experiments of Bidder and Schmidt and others, increases perceptibly several hours after digestion has commenced, and continues at its height for a certain period, again to diminish, though not entirely to cease, until the next digestive period comes round. It is liable to various diseases, such as inflammation and cancerous growths; a peculiar degeneration termed "cirrhosis," in which it becomes contracted, hard, and irregular in shape; a fibrinous or waxy infiltration; and a fatty degeneration, in which the proportion of fat globules naturally existing in the hepatic cells is so much increased that the whole organ loses its glandular texture and fails to perform the necessary functions which belong to it as a secreting organ.

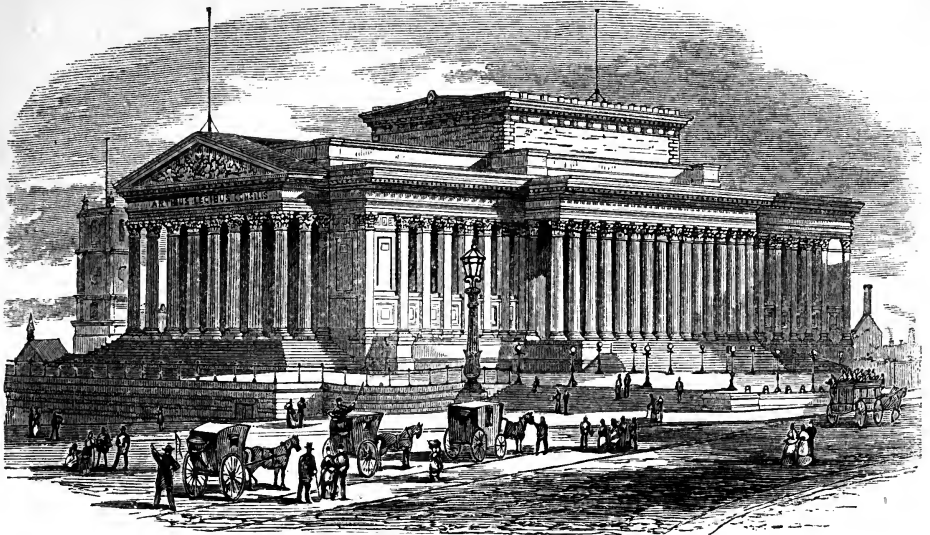
**LIVERIES.** See GUILD.

**LIVERMORE,** Abel Abbot, an American clergyman, born in Wilton, N. H., Oct. 30, 1811.

He graduated at Harvard college in 1833, studied in the Cambridge divinity school, and was ordained as pastor of the Unitarian church in Keene, N. H., Nov. 2, 1836. In 1850 he became pastor of the Unitarian church in Cincinnati, and in 1857 editor of the "Christian Inquirer" in New York, and pastor of the first Unitarian Congregational church in Yonkers. In 1863 he was chosen president of the theological seminary at Meadville, Pa. His principal works are: "The Four Gospels," with a commentary (2 vols., Boston, 1841-2; Belfast, Ireland, 1844); "The Acts of the Apostles," with a commentary (Boston, 1844; London, 1846); "Lectures to Young Men on their Moral Dangers and Duties" (1846); "The Marriage Offering," a compilation of prose and poetry (1848); "The War with Mexico Reviewed," a prize essay (1850); "Discourses" (1854); and "Christian Hymns" (5th ed., 1859).

**LIVERPOOL,** a borough and the principal seaport of England, in Lancashire, on the right bank of the river Mersey, 4 m. above its mouth in the Irish sea, 201 m. by railway N. W. of London and 31 m. W. by S. of Manchester; pop. in 1851, 375,955; in 1861, 443,938; in 1871, 493,346. Liverpool resembles in its bustle and animation more an American than an English town. It has wonderfully improved within the last 60 years, and now contains several wide and handsome streets. Many of the principal avenues diverge from the open space partly occupied by St. John's church and the railway station; as Dale street, running S. W. to the town hall and exchange buildings, and continued under the name of Water street to St. George's docks; White-chapel and Paradise street, leading to the custom house; Lime street, Renshaw street, Berry street, and Great George street, running almost S. in the direction of Toxteth park and the London road, following an eastward course toward the zoölogical gardens. The best known squares are St. George's, Queen's, Abercrombie, Clayton, and Cleveland. The town is abundantly supplied with water and gas. St. John's market covers 1½ acre, being 550 ft. long and 135 wide, and is supported by 116 pillars. There are other market places in different parts of the town. Among the principal public buildings are the custom house, in the Ionic style, with a lofty dome, and the town hall, with statues of Canning and Roscoe by Chantrey. The exchange buildings form three sides of a square, of which the town hall constitutes the fourth. The quadrangular area, with a monument in honor of Nelson, is used as an exchange. On the E. side of this exchange area is a news room, and above it are the underwriters' and cotton sales rooms. The W. and N. sides are occupied by the American and Liverpool chambers of commerce and by merchants' counting houses. Most of the business of Liverpool is transacted in this vicinity. There is a distinct market

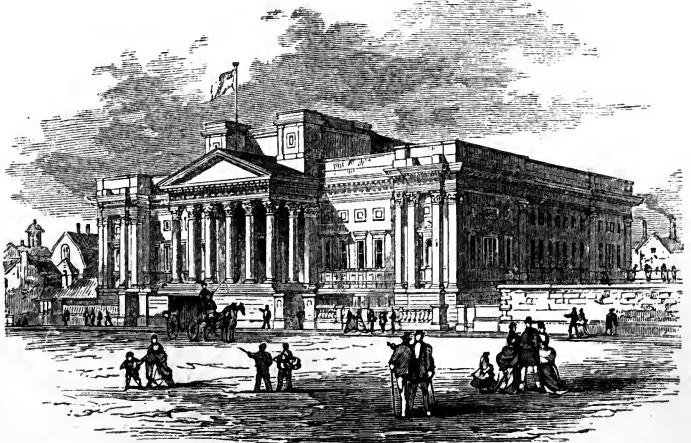
for the corn trade in Brunswick street.—The | St. George's hall, opened in 1851; it is a com-  
most celebrated public building in Liverpool is | manding edifice in the Corinthian style, with



St George's Hall, Liverpool.

columns 45 ft. high, and having two large rooms for the holding of assizes, and the great hall 161 ft. long and 75 in width and height, used for public meetings, concerts, &c. In 1872 there were 100 places of worship belonging to the established church, and 139 to other denominations. A Catholic bishopric was founded at Liverpool by Pope Pius IX. in 1850. The principal educational institution is the elegant Church of England college, fronting Shaw street, with ample provision for many branches of instruction, a sculpture gallery, a music hall, a laboratory, and a lecture hall holding over 2,000 persons. It is in the Tudor style from a design of Mr. Elmes, the architect of St. George's hall. The foundation stone was laid in 1840. It comprises three distinct day schools, and evening schools for adults. There are many other schools, several of which are attached to the mechanics' institution and to the royal institution. There are also schools for the deaf and dumb and the blind, and numerous charitable schools. The

royal institution has a museum of natural history and collections of fine arts, mineralogy, &c. There are associations for the promotion of the various branches of science, literature, and art, and a flourishing philharmonic society. The foundation stone of a free library and museum, to which Mr. William Brown contributed £30,000, was laid in 1857; and Mr. Joseph Mayer presented to it his extensive collection of Egyptian and other antiquities



Free Public Library and Museum, Liverpool.

and articles of *vertu*, the money value of which is estimated at nearly £40,000. The new mu-

seum has also been enriched by the donations and bequests of the 13th earl of Derby, and by collections from different museums of the town. Liverpool abounds with institutions for the relief of the distressed sick and for the reform of criminals, and with well attended public baths, wash houses, and drinking fountains. There are several theatres and music halls in the town, a botanic garden at Edgehill, and a zoological garden in West Derby road, whose attractions were increased by the munificence of the 18th earl of Derby. The hotels of Liverpool present extraordinary scenes of excitement on the arrival and departure of American steamers. The necropolis on Low hill near the zoological gardens, and the St. James cemetery, with the remains and statue of Mr. Huskisson, are the principal burial places. St. James's walk, near the cemetery, and the Princes' parade on the river bank, are well kept promenades. The environs are dotted with many elegant residences of the opulent merchants and the nobility. Liverpool is the most densely peopled city in England, containing in 1868 96 persons to an acre, while London had only 40, Birmingham 44, and Manchester 81. Until recently it was also one of the unhealthiest cities; but great sanitary improvements have been made, and the mortality, which in 1866 was 4.2 per cent., declined in 1868 to 3.3 per cent. The aggregate length of the sewers, which 20 years ago was 30 m., had reached 240 m. in 1868. The parliamentary borough of Liverpool is governed by 16 aldermen and 48 councillors, one of whom is mayor. The church livings are in the archdeaconry of Liverpool and diocese of Chester. The corporation is distinguished for its wealth and liberality. More than 30 consuls of foreign nations reside in Liverpool. — There are sugar refineries and other manufactures in Liverpool, and that of soap is most extensively carried on. Ship building is also very active, including sailing vessels, steamers, and war ships. In 1867 the splendid docks of Liverpool, including those of Birkenhead, covered 404 acres of water along the Mersey, and extended 5 m. on the Liverpool side of the river and 2 m. on the Birkenhead side. The lineal quay space on the Liverpool side is over 16 m., and on the Birkenhead side over 10 m. The amount of capital invested in the docks is £10,000,000, of which £7,000,000 is in Liverpool proper. The sea wall along the Liverpool side, by which shipping in the docks is protected against the elements, is upward of 5 m. in length, 11 ft. in average thickness, and 40 ft. in average height from the foundations. Upward of 80 pairs of gates have been erected, some of which reach to the enormous width of 100 ft. (See Dock.) The improvement of the approach to the river was to be completed in 1874; but the landing stage, the most magnificent structure of the kind in the world, was destroyed by fire, July 28, 1874. On Jan. 1, 1858, when the Mersey

docks and harbor act came into operation, the tonnage dues, which up to that time had to be paid by all vessels entering the port whether they used the docks or not, were abolished, so that no vessel or steamer, entering the river Mersey and not going into dock, has now any other dues to pay than those appertaining to lights, buoys, or anchorage.—Its contiguity to the ocean and to the British manufacturing districts, as well as the enterprise of its inhabitants, gives to Liverpool a foremost position in the trade of the world. Nearly one half of all the products exported from England are shipped from this port. The exports of British produce and manufactures for the year ending Jan. 1, 1874, were valued at £93,925,396. The principal articles of export were: cotton manufactures, £34,794,989; cotton yarn, £4,631,045; woollen manufactures, £11,299,679; linen manufactures, £4,648,362; iron, £11,350,312; hardware and cutlery, £2,626,994; haberdashery and millinery, £2,282,088. There is also a considerable exportation of foreign and colonial produce. The imports of such produce in 1873 amounted to £112,824,613, on which the amount of duties received was £3,176,927. More than half of all the madder, palm oil, bacon, hams, and lard, and nearly half of all the rice and unmanufactured tobacco imported into the United Kingdom in 1873, were entered at Liverpool. This is also the leading port for the receipt of grain, and is the greatest cotton market in the world. Of the 13,639,252 cwts. of raw cotton imported into the United Kingdom in 1873, 12,570,632 cwts. were received at Liverpool. The city has an extensive commerce with the United States, arising from the importation of cotton, flour, grain, and provisions, and the exportation of manufactured goods. During the year ending Sept. 1, 1874, out of 2,840,981 bales of cotton exported from the United States, 1,807,584 went to Liverpool. The total number of vessels that entered in 1873 was 15,104 of 6,339,376 tons, of which all but 1,231 had cargoes; 7,923 were sailing and 7,083 steam vessels; 4,042 were from foreign countries, including 1,509 from the United States, 1,043 from British possessions, and 9,408 in the coastwise trade. The total number of clearances, including 1,324 for the United States, was 15,006, of which 12,964 had cargoes. The registered shipping belonging to the port Jan. 1, 1874, comprised 1,866 sailing vessels of 990,867 tons, and 563 steamers of 412,464 tons. There were 29 vessels of 31,806 tons built here during the year. The majority of the 8,000,000 emigrants who left Great Britain from 1815 to 1874 sailed from Liverpool. Even of the German emigration a considerable portion has passed through this port.—The first authentic record relative to Liverpool is contained in a charter of Henry II. (1173), in which the privileges of a seaport are conferred upon the town. King John granted it a municipal charter, Aug. 28, 1207. It was constituted a free



borough by Henry III. in 1229. But it continued in a state of stagnation for many centuries. In 1644, during the contest between Charles I. and his parliament, the town held out for the latter nearly a month. Finally it was taken by Prince Rupert, and a great number of the inhabitants perished by the sword, and others soon afterward by pestilence and famine. Its population was insignificant in the middle of the 17th century, and was not much above 5,000 in 1699, when the town, which up to that time had been a chapelry attached to the parish of Walton, became an independent parish. The budding manufactures of Lancashire, Yorkshire, and Cheshire, and above all the plantations and the rise of America, gave a powerful impetus to its commercial activity; and the profitable and conspicuous part taken by the merchants and ship owners of Liverpool in the slave trade added considerably to the wealth of the town. At the beginning of the 18th century Liverpool had but a single dock. Between 1830 and 1860 over 25 new docks and basins were opened. In 1854 the corporation purchased the Birkenhead dock and estates for about £1,100,000, and made them available for the constantly increasing demands of trade. The half-tide and graving docks on the Herculaneum estate were completed and opened for use on March 16, 1866. Two new docks were finished in 1867. The railway to Manchester was commenced in 1825; in October, 1829, the directors awarded a prize to Stephenson's locomotive engine; the railway was opened Sept. 15, 1830, and in 1837 also that to Birmingham. The London railway was completed Sept. 17, 1838, and that to Preston Oct. 31. Liverpool is now the focus of a net of railways encircling the whole United Kingdom. A telegraph line to Holyhead was opened April 18, 1860. California and soon afterward Australia gave another stimulus to Liverpool. The Australian trade is steadily increasing, and promises to make this the greatest wool market in the world. After the abolition of the monopoly of the East India company in 1833, Liverpool began to rival London in the trade with the East. On the whole, however, the town may be said to have advanced in proportion to the progress of the United States, upon the trade with which country its prosperity is chiefly dependent.

**LIVERPOOL**, a town, port of entry, and the capital of Queens co., Nova Scotia, situated on the right bank of the river Mersey, here spanned by a bridge, at its entrance into Liverpool harbor, 70 m. S. W. of Halifax; pop. in 1871, 3,104. It is well and regularly built, has a good harbor protected by a lighthouse, with a revolving light 75 ft. high, and is the centre of an important and increasing trade. The number of vessels entered for the year ending June 30, 1872, was 122, with an aggregate tonnage of 21,688; cleared, 102, of 14,914 tons; value of imports, \$157,140; of exports, \$253,365, chiefly lumber, staves, and fish. Ship building

is extensively carried on. The town contains saw mills, iron founderies, machine shops, &c., a weekly newspaper, and five churches.

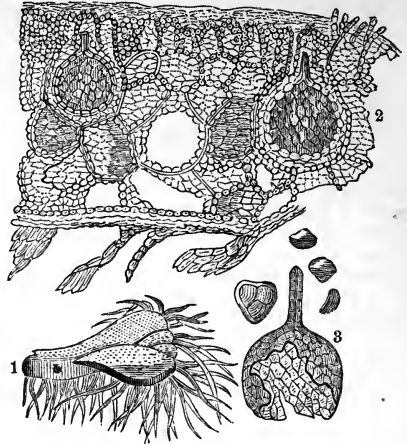
**LIVERPOOL**, a town of New Brunswick. See **RICHIBUCTO**.

**LIVERPOOL**. **I.** Charles Jenkinson, first earl of, a British statesman, born May 16, 1727, died Dec. 17, 1808. He was educated at the Charterhouse, and at University college, Oxford, and entered parliament in 1761. In the same year he was appointed under-secretary of state, in 1763 joint secretary to the treasury, in 1766 a lord of the admiralty, and in 1778 secretary at war, a post which he retained until the close of Lord North's administration. Adhering thenceforth to the party of Mr. Pitt, he was appointed in 1784 president of the board of trade. After 17 years' tenure of this office he retired in 1801. He was a man of respectable attainments, but was to an unusual degree the object of popular dislike on account of his supposed undue influence with the king. He wrote several political works, the most important of which are a "Collection of all the Treaties of Peace, &c., between Great Britain and other Powers, from 1648 to 1783," with a "Discourse on the Conduct of Great Britain in respect to Neutral Nations" (3 vols. 8vo, London, 1785); and a "Treatise on the Coins of the Realm" (4to, Oxford, 1805). He was created Lord Hawkesbury in 1786, and earl of Liverpool in 1796. **II.** Robert Banks Jenkinson, second earl of, eldest son of the preceding, born June 7, 1770, died Dec. 4, 1828. He was educated at the Charterhouse and at Christchurch college, Oxford. In 1790, before he had attained his majority, he was elected to parliament as member for Rye, and upon taking his seat in the succeeding year proved himself a ready debater and an efficient supporter of the ministry. Upon the retirement of Mr. Pitt in 1801 he was appointed foreign secretary in the Addington cabinet, in which capacity he conducted the negotiation which terminated in the treaty of Amiens. Upon the return of Pitt to power he took office as home secretary, and in the latter part of 1808 was called to the house of peers as Lord Hawkesbury, in virtue of his father's barony of that name. The death of Pitt (1806) interrupted his official career, and although offered the premiership, he preferred to remain in opposition during the Fox and Grenville administration. Upon its dissolution he again declined to form a ministry, but accepted the home department, which he retained until the assassination of Mr. Perceval. At the request of the prince regent, whose fullest confidence he always enjoyed, he then accepted, although with reluctance, the vacant premiership. His administration extended from 1812 to 1827, a longer period than that of any other modern British premier except Walpole and Pitt, and was rendered permanent and successful mainly through the efforts of Castlereagh and Canning in the foreign office. The military successes

of England brought him at the outset considerable popularity; but the distresses which followed after the war, and the severe measures adopted to repress internal disturbances, subsequently aroused against him a strong feeling of dislike, which was increased by the introduction of the bill of pains and penalties against Queen Caroline. To liberal opinions he was always steadfastly opposed, and his efforts, extending over a period of more than 30 years, greatly contributed to retard Catholic emancipation, parliamentary reform, the emancipation of the slaves in the West India colonies, and other kindred measures. His private character was above reproach, and few ministers holding such extreme views have been more respected by political adversaries. He was attacked by paralysis, Feb. 17, 1827, and passed the last three months of his life in a state of helplessness and imbecility.

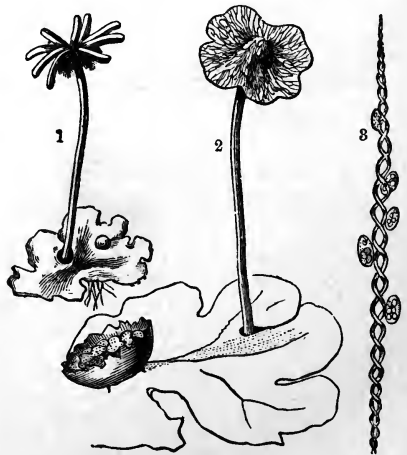
**LIVERWORTS**, a family of cryptogamous plants, called *hepaticæ* by botanists. The liverworts are humble, often very minute plants, in some genera resembling the lichens and in others the mosses, from both of which they differ in their organs of reproduction. In some genera the vegetative portion of the plant is frondose, consisting of a leaf-like expansion of very loose cellular tissue, which spreads upon the ground and emits rootlets from its under surface; this is variously lobed or forked; in other genera there is a distinct stem, bearing true leaves in two rows, and there is often on the under side of the stem a row of rudimentary stipule-like leaves (*amphigastria*); the leaves are entire, toothed, lobed, or even deeply divided, and the form and markings of these as well as of the amphigastria being very constant in each genus and species, they afford characters by which the plants may be distinguished when the fructification is wanting. The reproductive organs are of two kinds, corresponding in their office to the stamens and pistils in the higher orders of plants; these are monoecious or dioecious, are sometimes sunk within the substance of the frond as in *Riccia*, sometimes above it, or, as in *Marchantia*, elevated upon a pedicel. The *antheridia*, or male organs, consist of numerous oblong or spherical sacs, which when ripe rupture and liberate their contained cells, which in a short time emit the antherozoids, minute filiform bodies which bear at one extremity two still smaller threads. The pistillate organs, termed *pistillidia* or *archegonia*, after receiving the action of the antherozoids, increase in size and form the *sporangia* or the true fructification; these open usually by four valves to discharge their spores, the true reproductive bodies; the spores are contained in fours in mother cells; their dissemination is often aided by elongated cells, the elaters, which are capable of a spirally twisting movement. The capsule or sporangium is usually surrounded by a tubular organ, the perianth, and this again by an involucre, also tubular, or

leaves of a peculiar form. Besides this sexual reproduction, liverworts are often multiplied by bulbils, which are variously shaped cellular bodies, capable of growing and producing a plant; these bulbils are in the marchantias produced in little cups, elegantly fringed on



*Riccia natans*.—1. The Plant. 2. Magnified Section. 3. Calyptra and Spores.

their edges, which are situated upon the upper surface of the fronds; in other genera they are produced in different parts of the plant.—The large family of the liverworts is divided into suborders. Berkeley, who is an author-



*Marchantia polymorpha*.—1. Female Plant. 2. Male Plant with cupule. 3. Elater and Spores.

ity in cryptogamic botany, makes three, which he thinks should rank as natural orders: 1, the *Ricciaceæ*, which consists of a few chiefly floating frondose plants, which produce rootlets from beneath, and have their organs of fructification sunk in the frond, or sometimes

seated on its surface; spores without elaters; 2, *Marchantiaceæ*, frondose terrestrial perennials, with the valvate capsules upon the under side of a target-shaped, stalked disk; spores mixed with elaters; 3, *Jungermanniaceæ*, mostly leafy plants with solitary fruit which splits into four equal valves; spores mixed with elaters. These divisions are in systematic works subdivided by characters afforded by the fruit, leaves, &c. The liverworts are found in all parts of the world where excessive dryness does not prevail; while some are peculiar to temperate or cold regions, others are found only in tropical ones; two species of *Jungermannia* have been detected enclosed in amber, the only instances in which plants of this family have been found in the fossil state. The old herbalists called the frondose marchantias liverworts, and from their lobed appearance saw some resemblance in form to that of the liver; according to the

will sometimes become so covered with the fronds of *Marchantia* that the tiny plants cannot force their way through the mass; or after the plants are fairly up, if not watched this liverwort may increase so rapidly as to choke and destroy them. Liverworts are to be sought for in moist places, on the faces of damp rocks and on the bark of trees; the margins of springs and the beds of streams which become dry in summer are favorite places for the collector; the plants may be readily kept in a growing state, and their development watched, by placing them in a dish under a bell glass and supplying them with water.—When Linnæus published his *Species Plantarum* (1753) only 44 species were known, but the number in 1842 exceeded 600, and the labors of botanists since that time have led to the discovery of many others. The American liverworts were elaborated for the second edition of Gray's "Manual of Botany" (1856) by the late W. S. Sullivant of Ohio, who gave descriptions of 123 species in 38 genera; this memoir, together with that on mosses by the same author, was also published separately under the title of "The Musci and Hepaticæ of the United States east of the Mississippi River," illustrated with elaborate copperplate engravings of the structure in each genus. Mr. C. F. Austin of Closter, N. J., who has given special attention to these plants, published in 1873, under the title *Hepaticæ Boreali-Americanae*, a collection of dried specimens; this consists of 150 species, including several not before described. Besides these works, the student is referred to Schwägrichen, *Historia Muscorum Hepaticarum Prodromus* (Leipsic, 1804); Hooker, "British *Jungermannia*" (2 vols. fol., London, 1818, a beautifully illustrated work); Schweinitz, *Hepaticæ America Septentrionalis* (Raleigh, N. C., 1821); Nees von Esenbeck, *Hepaticæ Javanicae* (Breslau, 1831), and *Naturgeschichte der Europäischen Lebermoose* (4 vols. 8vo, Berlin and Breslau, 1833-'8); Montagne, *Essai d'organographie de la famille des hépatiques* (Paris, 1845); *Hepaticæ*, in "Catalogue of Plants of Cincinnati," by Thomas G. Lea (1849), and in "Memoirs of the American Academy," new series (1850); and Berkeley, "Introduction to Cryptogamic Botany" (London, 1857). An elaborate account of the microscopic structure and the development of the *hepatica* is to be found in Sachs, *Lehrbuch der Botanik* (Leipsic, 1873).

**LIVERY OF SEISIN** (Fr. *liverie de seisine*; Lat. *deliberatio* or *traditio seisinæ*). A change of possession naturally accompanies, as it is indeed the best evidence of, a transfer of property. Personal chattels may be corporeally exchanged; but the alienation of immovable property must be certified by some ceremony or act sufficient to express the change of ownership. Under the system of feudal tenures, the possession of lands was delivered by the lords to their vassals, by the solemn and public act of investiture. This ceremony took place upon the land



*Plagiochila macrostoma.*

then prevailing view, this indicated that the plants were adapted to cure diseases of the liver, and we find them in the early works recommended for liver complaints under the name of *hepatica*. Though the generic name *hepatica* is now attached to a ranunculaceous plant, closely related to *anemone*, the name *hepatica* has been unfortunately (as leading to confusion) retained for the liverworts. Some species of liverworts have a strong and peculiar odor and an acrid taste, but so little is known about their uses that they cannot be regarded as of any importance to man. In some cases *Marchantia polymorpha* (and perhaps others) is sufficiently troublesome to be regarded as a weed; in the moist climate of England it often annoys the gardener by spreading over the rocks of the fernery to the exclusion of other plants, and in greenhouses everywhere it is a frequent intruder; some seeds are very slow of germination, and the soil of the pan or pot in which they are sown

itself, in the presence of the peers of the lord's court, and originally by merely personal acts, without writing. The possession which complete investiture gave to the vassal was called his seisin, and this delivery of it by the superior was the livery of seisin. The design of the ceremony was to notify the transmission of the fee from one hand to another. For the lord, the peers of his court could bear witness to the obligations of servitude which the vassal had assumed, and to the conditions and limitation of the gift, if any had been annexed to it. For the tenant, they could testify to the fact of the grant in the event of a dispute respecting the freehold, and in other respects their testimony sufficed to assure his rights. But to make the evidence of these rights more certain, and to define more exactly the conditions of the fact, writings came to be introduced, declaring the tenor and terms of the investiture. In the general feudal law, such writings were called *brevia testata*; that is to say, short written memoranda, attested by witnesses. They bore no date, nor were they executed or sealed by the parties themselves; their authority rested altogether in the testimony of the witnesses. When then, in England, some more precise evidence of the agreement between lord and tenant had come to be required than the mere parol testimony of the peers of the court, these *brevia testata* were imitated, and a charter of feoffment was executed and delivered to the new possessor of the lands, at the same time with the livery of seisin. This charter of feoffment was the evidence of the gift or grant, and the livery of seisin was only the transfer of the possession. Livery was of two kinds: livery in deed, and livery in law. The former was made, in the words of Sir E. Coke, "by delivery of the ring or haspe of the doore, or of a branch or twigge of a tree, or of a turfe of the land, and with these or the like words, the feoffor and feoffee both holding the deed of feoffment and the ring or haspe, and the feoffor saying: 'Here I deliver you seisin and possession of this house, in the name of all the lands and tenements contained in this deed, according to the form and effect of the deed.'" Livery in law was not upon the land, but in sight of it, and the feoffee's title was not good until the livery was perfected by his actual entry upon the land during the feoffor's life. These charters of feoffment which accompanied livery of seisin were in early times but rarely signed. Sealing however became common and nearly universal, and imported the assent of parties to the instrument thus attested. This custom of affixing a seal remained long after the occasion for it had passed away, and founded the present rules of law in this respect. As these written charters or deeds (for they are nothing else) became more perfect, the more formal ceremonies of investiture were dispensed with. The doctrine of seisin, however, maintained its place in the English law until very lately. In respect to descents its importance was modified by the

statute 3 and 4 William IV.; and in regard to conveyances, lands might still be conveyed by a verbal contract alone, provided it was attended with public delivery of possession, until the latter part of the reign of Charles II., when the statute of frauds and perjuries enacted that there must be thenceforth some evidence in writing to support the grant. (See FRAUDS, STATUTE OF.)—Livery of seisin is entirely foreign to the American system of conveyances. A deed properly executed and delivered gives seisin in deed without entry; nor is the entry of an heir required to give him actual seisin.

**LIVIA DRUSILLA**, the wife of the emperor Augustus, born in 56 or 54 B. C., died in A. D. 29. She was the daughter of Livius Drusus, and was married first to Tiberius Claudius Nero, who, having fought against Octavius in the Perusian war, was afterward compelled to divorce his beautiful wife in favor of the victorious triumvir. She had already borne her husband the future emperor Tiberius, and a few months after her second marriage she bore another son, Drusus. She retained the affections of the emperor, by whom she had no children, till his death, owing to her fidelity, fascinating manners, and indulgence of conjugal derelictions on his part. She was skilled in the arts of dissimulation, and stands accused of having caused by foul means the deaths of various persons of the family of her husband who stood in the way of the succession of her own children. She was even suspected of having hastened by poison the death of Augustus himself. On the accession of Tiberius, when she believed she had finally attained the aim of her desires, imperial sway, she soon learned that she had misunderstood the disposition of her son, whose jealousy removed her from the court, and whose hatred was manifested even after her death.

**LIVINGSTON**, the name of six counties in the United States. **L. A. W.** county of New York, watered by the Genesee river and a number of creeks; area, 509 sq. m.; pop. in 1870, 38,309. Its surface is an upland, rolling in the north and hilly in the south, and its soil is of exceeding fertility. It contains Conesus and Hemlock lakes, and mineral springs at Avon, a well known watering place. It is traversed by the Genesee Valley canal and by the Buffalo and the Rochester divisions of the Erie railway, the Dansville and Mt. Morris branch, and the Canadawga, Batavia, and Towanda division of the New York Central railroad. The chief productions in 1870 were 947,489 bushels of wheat, 579,313 of Indian corn, 779,189 of oats, 465,365 of barley, 42,140 of buckwheat, 313,274 of potatoes, 605,341 lbs. of wool, 72,140 of flax, 155,703 of hops, 1,069,300 of butter, 39,322 of cheese, and 72,757 tons of hay. There were 11,599 horses, 11,109 milch cows, 15,689 other cattle, 113,933 sheep, and 10,504 swine; 16 manufactories of agricultural implements, 3 of brooms and wisp brushes, 29 of carriages and wagons, 12 of

cooperage, 10 of iron castings, 4 of machinery, 3 of malt, 5 of paper, 15 of saddlery and harness, 7 of tin, copper, and sheet-iron ware, 2 of woollen goods, 4 tanneries, 21 flour mills, 2 planing mills, and 16 saw mills. Capital, Geneseo. **II.** A S. E. parish of Louisiana, bounded S. and W. by Amite river, and intersected by the Tickfah; area, about 650 sq. m.; pop. in 1870, 4,026, of whom 933 were colored. Lake Maurepas is on its S. E. border. It has a level surface and a moderately fertile soil. The chief productions in 1870 were 46,595 bushels of Indian corn, 20,923 of sweet potatoes, 1,426 bales of cotton, 20,900 lbs. of rice, 135 hogsheads of sugar, and 3,518 gallons of molasses. There were 935 horses, 2,712 milch cows, 4,694 other cattle, 3,110 sheep, and 10,071 swine. Capital, Springfield. **III.** A W. county of Kentucky, separated from Illinois by the Ohio, bordered S. by the Tennessee, and intersected by the Cumberland river; area, 245 sq. m.; pop. in 1870, 8,200, of whom 1,052 were colored. The chief productions in 1870 were 27,525 bushels of wheat, 308,298 of Indian corn, 30,726 of oats, 23,735 of potatoes, 1,086,578 lbs. of tobacco, 11,996 of wool, and 44,512 of butter. There were 1,429 horses, 701 mules and asses, 1,439 milch cows, 2,654 other cattle, 6,344 sheep, and 10,997 swine; 2 flour mills, 3 saw mills, and 2 manufactories of barrels and casks. Capital, Smithland. **IV.** A N. E. county of Illinois, drained by the Vermilion river; area, 1,026 sq. m.; pop. in 1870, 31,471. The surface is undulating and the soil fertile. The Chicago and Alton, the Toledo, Peoria, and Warsaw, and the Illinois Central railroads pass through it. The chief productions in 1870 were 130,545 bushels of wheat, 1,182,696 of Indian corn, 659,300 of oats, 93,788 of potatoes, 27,979 lbs. of wool, 809,020 of butter, and 64,013 tons of hay. There were 13,897 horses, 10,225 milch cows, 14,651 other cattle, 6,766 sheep, and 28,100 swine; 8 manufactories of carriages, 7 of saddlery and harness, 3 of sash, doors, and blinds, 6 of tin, copper, and sheet-iron ware, 2 of woollen goods, and 5 flour mills. Capital, Pontiac. **V.** A S. E. county of Michigan, drained by Huron, Shiawassee, and Red Cedar rivers; area, 576 sq. m.; pop. in 1870, 19,336. The surface is undulating, and the soil, which consists of a rich black sandy loam, is very fertile. The Detroit, Lansing, and Lake Michigan railroad crosses it. The chief productions in 1870 were 673,701 bushels of wheat, 454,923 of Indian corn, 247,801 of oats, 40,481 of barley, 293,832 of potatoes, 106,229 lbs. of hops, 455,540 of wool, 751,357 of butter, and 43,027 tons of hay. There were 7,185 horses, 7,129 milch cows, 8,696 other cattle, 103,527 sheep, and 9,923 swine; 13 manufactories of carriages, 6 of cooperage, 6 of iron castings, 2 of machinery, 2 of sash, doors, and blinds, 4 flour mills, and 8 saw mills. Capital, Howell. **VI.** A N. W. county of Missouri, watered by Grand river and its branches, the Crooked Fork, Medicine, and Shoal creeks;

area, 510 sq. m.; pop. in 1870, 16,730, of whom 956 were colored. The surface is level and the soil fertile. The Hannibal and St. Joseph railroad and the Chillicothe and Omaha branch of the St. Louis, Kansas City, and Northern line cross it. The chief productions in 1870 were 141,657 bushels of wheat, 756,428 of Indian corn, 248,535 of oats, 57,817 of potatoes, 323,362 lbs. of tobacco, 292,694 of wool, 239,507 of butter, and 5,917 tons of hay. There were 5,182 horses, 1,033 mules and asses, 4,250 milch cows, 7,485 other cattle, 14,262 sheep, and 17,396 swine; 5 manufactories of brick, 1 of sash, doors, and blinds, 6 of tin, copper, and sheet-iron ware, 4 flour mills, and 8 saw mills. Capital, Chillicothe.

**LIVINGSTON**, the name of a family various members of which have been distinguished in American history. John Livingston (born in 1603), the common ancestor of the family, and a lineal descendant of the fifth Lord Livingston, ancestor of the earls of Linlithgow and Callender, was an energetic preacher of the Reformed church in Scotland, and, having been banished in 1663 for nonconformity to prelatical rule, took refuge in Rotterdam, where he died in 1672. Of his seven children, his son Robert (born in 1654) emigrated to New York about 1675, and in 1686 received from Gov. Dongan a grant of a large tract of land, which was in 1715 confirmed by a royal charter of George I. erecting the manor and lordship of Livingston, with the privilege of holding a court leet and a court baron, and with the right of advowson to all the churches within its boundaries. This tract embraced large portions of what are now the counties of Dutchess and Columbia, N. Y., and is still known as the Livingston manor, though the greater part of it has long since passed out of the hands of the family. He was a man of influence in the colony, and procured the fitting out of the ship with which Capt. Kidd undertook to restrain the excesses of the pirates. He was connected by marriage with the Schuyler family, and had three sons, Philip, Robert, and Gilbert, from whom the most distinguished members of the family in America are descended. **I. Philip**, a signer of the Declaration of Independence, son of Philip and great-grandson of John Livingston, born in Albany, N. Y., Jan. 15, 1716, died in York, Pa., June 12, 1778. He graduated at Yale college in 1737, subsequently embarked in business in the city of New York, and in 1754 and several years afterward served in the capacity of alderman. In 1758 he was returned to the colonial house of assembly from the city of New York, and continued a member of that body till 1769, when in consequence of his strong whig views he was unseated by the tory majority. He was chosen a member of the first and second continental congresses. He subsequently served in the New York provincial congress, in the state assembly and senate, and at the time of his death was a delegate



from New York to the continental congress, then sitting in York. **II. William**, governor of New Jersey, brother of the preceding, born in the province of New York in September, 1723, died in Elizabethtown, N. J., July 25, 1790. He graduated at Yale college in 1741, and subsequently became an eminent member of the bar in New York and New Jersey. He was elected a delegate to the first continental congress from the latter province in 1774, and after the deposition of William Franklin in 1776 succeeded to the office of governor, which he retained to the close of his life. During the period in which the Jerseys were the principal seat of the war he was indefatigable in his efforts to keep the militia in a state of efficiency. In 1787 he was a delegate to the convention which framed the federal constitution. He was the author of a poem called "Philosophical Solitude," a funeral oration on President Burr of Princeton college, and a variety of political and miscellaneous tracts. **III. Brockholst**, a soldier and jurist, son of the preceding, born in New York, Nov. 25, 1757, died in Washington, March 18, 1823. He graduated at Princeton college in 1774, and in 1776 became a member of the family of Gen. Schuyler, whom he attended as aide-de-camp during the operations of the army in the north. He was subsequently attached to the suite of Gen. Arnold with the rank of major, was present at the surrender of Burgoyne, and before leaving the army was promoted to a colonelcy. In 1779 he went to Spain as private secretary to Mr. Jay, who had married his sister. Returning home after three years' absence, he studied law, was admitted to the bar in 1783, was appointed judge of the supreme court of the state of New York in January, 1802, and in November, 1806, was raised to the bench of the United States supreme court. **IV. Robert R.**, a statesman and jurist, grandson of the second Robert Livingston, born in the city of New York, Nov. 27, 1746, died Feb. 26, 1813. He graduated at King's (now Columbia) college in 1765, studied and practised law in New York, and in 1773 was appointed recorder of that city, a judicial office of which he was soon deprived on account of his participation in revolutionary measures. He was a member of the second continental congress, and was one of the committee of five appointed to draft the Declaration of Independence. He was prevented from signing that instrument by a necessary absence from Philadelphia; but he furthered the cause with zeal and efficiency throughout the war, being a member of congress again in 1780, and secretary of foreign affairs for two years commencing in August, 1781. He was also a leading member of the Kingston convention which framed the first constitution of the state of New York, adopted in April, 1777. He was appointed the first chancellor of the state, and held the office till 1801, administering the oath of office taken by Washington on first assuming the duties of

president, April 30, 1789. In February, 1801, he was appointed minister plenipotentiary to France; and in April, 1803, he completed the purchase from that country of the territory of Louisiana. Mr. Monroe had been despatched as special envoy to assist him in the negotiation, but it was so far advanced before the arrival of the latter that the treaty of cession was signed a few days afterward. Mr. Livingston resigned his post in 1804, and, after travelling over the continent, returned home the next year. During the remainder of his life he was actively engaged in introducing into the state of New York several improvements in agriculture, and in measures for the encouragement of a taste for the fine arts among his countrymen; and he was associated with Robert Fulton in the early experiments in steam navigation. **V. Edward**, brother of the preceding, an American jurist and statesman, born in Clermont, Columbia co., N. Y., May 26, 1764, died in Rhinebeck, May 23, 1836. He graduated at Princeton college in 1781, studied law at Albany, and on his admission to the bar in 1785 commenced practice in the city of New York, where at an early age he attained high rank as a jurist and advocate. In 1794 he was elected a representative in congress from the district including the city of New York, and was reelected to the following two congresses, in which he was an opponent of the administrations of Washington and Adams upon the various party questions of the period. In March, 1801, he was appointed by Mr. Jefferson United States district attorney for the state of New York, then composing but one judicial district. He was also elected mayor of the city of New York for two years, commencing in 1801. By virtue of the latter office he was at the same time judge of an important municipal court of record. A volume of reports of his judicial opinions, delivered in that court during the year 1802, edited by himself, was published at New York in 1803. During his mayoralty the city was visited by yellow fever, when his benevolence and intrepidity in remaining at his post nearly cost him his life. He now found his private affairs so involved, through the fault of others it is said, that he was unable to pay his debts, including a considerable balance due to the general government. He promptly resigned his offices and removed to New Orleans, in hopes to retrieve his fortunes by fresh exertions in a new field. In this he succeeded thoroughly, paying his debt to the government in full, principal and interest, and making head against great difficulties, not the least of which was a severe controversy respecting the title which he had acquired to some lands at New Orleans formed by gradual deposits from the annual inundations of the Mississippi river, and called the Batture; a controversy in which, among other opposition, he encountered that of the federal government under the personal management of Mr. Jefferson himself. This matter was the

subject of a special message to congress of March 7, 1808, and of a pamphlet by the president, as well as of a pamphlet by Mr. Livingston in reply. The latter eventually triumphed in the courts, though the complete pecuniary fruits of the victory only came to his family long after his death. Many years later Mr. Livingston and Jefferson became heartily reconciled. Soon after his arrival in the territory the legislature of Louisiana commissioned him to prepare a system of judicial procedure, which was adopted in 1805, and continued in force till 1825, when it was superseded by the new and elaborate code of practice. In 1823 he was appointed, conjointly with Mr. Louis Moreau-Lislet, to revise the civil code of Louisiana, a work which was completed the next year, and substantially ratified by enactment. In 1821 Mr. Livingston had been intrusted solely with the task of preparing a code of criminal law and procedure. The next year he made a report of his plan for this work, which was soon afterward reprinted in London and Paris. The work itself was submitted to the legislature in 1826, but was never directly acted upon by that body, although by a joint resolution of March 21, 1822, the plan had been approved and its completion "earnestly solicited." However, the author derived from its publication great celebrity, both in America and in Europe. It was published at Philadelphia in 1833, in 1 vol. 8vo. He had completed his draft in 1824, and a copy had been made for the printer, when both copies were destroyed by fire. The next day, at the age of 60 years, he commenced the reconstruction of the work, and in two years more it was again complete. Upon this performance the best part of Mr. Livingston's fame rests. It is a comprehensive code, or series of codes, of crimes and punishments, of evidence, of procedure, of reform, of prison discipline, and of definitions, and is characterized throughout by the simplicity of its arrangement and by the wisdom and philanthropy of its provisions. It has visibly influenced the legislation of several countries, and portions of it have been enacted entire by the republic of Guatemala. All these juridical works were required to be prepared in both French and English, and called for the exercise of profound and philosophical knowledge, not only of the laws of England and the United States, but of the French, the Spanish, and the civil law. In 1823, on his retiring from the bar, Mr. Livingston was elected a representative in congress from Louisiana, which office he held till 1829, when he was made a United States senator from the same state. In 1831 he succeeded Mr. Van Buren as secretary of state of the United States, and in 1833 was appointed by President Jackson minister to France, where he resided till 1835, managing with success several affairs of more than ordinary importance and difficulty. On his return home he retired to Rhinebeck in his native county. An eloquent eulogy upon his life and works was pronounced by M. Mi-

gnet in 1838 before the French academy of moral and political sciences, of which he had been chosen an associate a few years before. Mr. Livingston was a man of very social tastes, great gayety of manners, and perfection of temper. Amiability and goodness of heart were always the terms first employed in describing his character by those who remembered him. His life by C. H. Hunt was published in New York in 1864, and his "Complete Works on Jurisprudence," in 2 vols., in 1873. **VI. John H.**, grandson of Gilbert Livingston, born in Poughkeepsie, N. Y., May 30, 1746, died in New Brunswick, N. J., Jan. 20, 1825. He graduated at Yale college in 1762, and began the study of law; but resolving to devote himself to the ministry, he studied theology at Utrecht in Holland, where he received the degree of D. D. in 1770. In the autumn of that year he returned to America, and at once became pastor of the Dutch church in New York city. In 1775 he was married to his third cousin, the daughter of Philip Livingston; and in 1776, having removed from New York on the occupation of that city by the British, he accepted a call to Albany, where he remained three years. He then preached successively at Kingston and Poughkeepsie, and at the close of the war returned to New York. In 1784 he was appointed by the general synod of America their professor of divinity, but it was not till 1795 that a regular seminary was opened under his direction at Bedford, L. I. This establishment was closed after two years for lack of support, and he resumed his labors in New York. In 1807 the professorate was united to Queen's college, New Brunswick, N. J., and Dr. Livingston was appointed president and professor of theology. He removed to New Brunswick in 1810, and there passed the rest of his life. His published writings comprise "A Funeral Service;" "Incestuous Marriage," a dissertation on marriage with a sister-in-law (1816); and some occasional pieces. There is a memoir of his life by the Rev. Alexander Gunn (New York, 1829).

**LIVINGSTONE, David**, a British traveller and explorer, born at Blantyre, near Glasgow, Scotland, March 19, 1813, died at Ijala, central Africa, May 1, 1873. He was the son of a poor weaver, and gained the greater part of his early education by attending an evening school while he was employed in the cotton mills near Glasgow. Later he so arranged his time as to secure the winter months for study, supporting himself by his labor during the remainder of the year. His family were earnest Presbyterians, and his attention was early turned toward questions of religious belief. His religious enthusiasm was strongly excited by the idea of a missionary life, and he determined to prepare himself for this career. Having studied theology and medicine for several years at Glasgow, still supporting himself as before, he offered his services to the London missionary society as a missionary

to Africa, and they were promptly accepted. Somewhat later he was formally ordained, and in 1840 he left England for Port Natal. Here he became acquainted with a fellow missionary, Robert Moffat, whose daughter he afterward married; and after a short residence here he proceeded inland to the mission station of Kuruman, in the Bechuana country, about 600 m. N. E. of Cape Town. Here and at several other stations he was occupied in teaching and missionary labor till 1849, making such journeys and explorations as were incidental to his work, and sending to England much valuable geographical and scientific information, but undertaking no expeditions independent of his missionary occupations. In 1849, however, he made his first journey in search of Lake Ngami, about which he had obtained such information as he could from the natives. On Aug. 1 he discovered the lake, and during the few days following explored its borders, afterward making an extended voyage down its outlet, the Zouga. In 1852, having sent his family to England, Livingstone started again on a journey of discovery, and continued it beyond his original intention. During four years he traversed South Africa from the Cape of Good Hope, by Lake Ngami, to Linyanti, thence to the western coast in lat. 10° S., then returned to Linyanti, and after passing through Tete, descended the Zambesi to the sea, passing over an estimated distance of 11,000 m. For this achievement he received the Victoria gold medal of the royal geographical society; and on his visiting England in 1856 he was received with distinguished honors. In 1857 he published his first work on his travels and discoveries, under the title of "Missionary Travels and Researches in South Africa," in which he gave a detailed account of the explorations above referred to. At the beginning of the volume is also a brief autobiographical sketch. In the spring of 1858 he returned to Africa, and, with the aid of the government and of private subscriptions, prepared to prosecute, with several assistants, further explorations in the southern part of the continent. Going to Quilimane, at the mouth of the Zambesi river, he travelled thence N. W., at first following up the Zambesi, and afterward diverging to the north and exploring Lake Nyassa, which he discovered in September, 1859. The results of this expedition, which was not ended till 1863, included also the exploration of the country W. and N. W. of the lake for a distance of about 300 m., and of the whole district about the head waters of the N. E. branch of the Zambesi and its tributaries. Mrs. Livingstone, who had accompanied her husband, died during the journey at Shupanga, April 27, 1862. In 1864 Dr. Livingstone returned to England, and in the following year published "Narrative of an Expedition to the Zambesi and its Tributaries." He immediately made preparations for another expedition, and again left England in April, 1865. For more than a year nothing was heard from

him, and in March, 1867, a report reached England that he had been killed in a skirmish with the natives near Lake Nyassa. This report was not generally credited, and on June 9 an expedition under the command of Mr. E. D. Young left England in search of him. News from Mr. Young was received in London in January, 1868, stating that he believed Livingstone to be still alive. In April following letters from Livingstone himself were received from a point far to the west of where he was reported to have been murdered, stating that he was in good health. Nothing more was heard of him till November, 1869, when a letter was received from him dated July, 1868. He was then near Lake Bangweolo, and expressed the opinion that the sources of the Nile would be found between lat. 10° and 12° S., in the region assigned by Ptolemy. In later communications from him he seemed to entertain doubts of the correctness of this opinion, and said repeatedly that the conjecture had presented itself to his mind that he was in the region of the sources of the Congo river, one of the largest in the world. This conjecture is now believed by many of the most eminent geographers to be correct. The next communication received from him was dated at Ujiji, May 13, 1869; and another long silence of nearly two years' duration followed. Finally the "New York Herald" despatched Mr. Stanley, one of its correspondents, in search of the missing traveller. Mr. Stanley reached Ujiji in the autumn of 1871, and there found Livingstone alive and well. Livingstone and Stanley together now made a journey to the N. end of Lake Tanganyika, and believed that they had ascertained conclusively that the lake has no communication with the Nile. Mr. Stanley left Livingstone at Unyanembe in March, 1872, and returned to England. It was then the intention of the traveller to remain for about a year longer in south central Africa in the prosecution of his explorations. In the following August, after receiving men and supplies from Zanzibar, he started on an expedition toward the E. side of Lake Bangweolo, and the reported sources of the streams which form the Lualaba. He proposed to spend nine or ten months in this journey, and then return to England for permanent residence. From this time no news of his progress was received from the explorer's own hand; but it is known through information acquired after his death that he reached his destination by passing around the lower end of the lake and proceeding along its S. shore. It also appears probable that he went northward and explored certain copper mines in the region of Katanga, of which he had received accounts from the natives; but accurate details concerning this last of his journeys are entirely wanting. Meanwhile, after Stanley's news of the discovery of Livingstone and his intentions for the future had reached England, an expedition to be sent to the explorer's assistance had been

organized under the auspices of the royal geographical society, and had started for Africa early in 1873, under the command of Lieut. Cameron. Leaving Zanzibar for the interior on March 18, this relief party, after a series of difficulties and delays, reached Unyanyembe on Aug. 4. It was here, while Cameron was purchasing supplies and preparing for further progress, that the news of Livingstone's death was first received. Chumah, one of his party of natives sent ahead by the remaining men of the expedition, who were returning with the body of their leader, arrived in Unyanyembe on Oct. 16, bringing a letter with details from Livingstone's negro servant Wainwright. The explorer and his men had been marching eastward, on their return to their point of departure. Compelled to cross a broad tract of inundated country, they had endured the greatest hardships, to which several had finally succumbed. Livingstone himself was seized with dysentery, and died after about a fortnight's illness. The survivors of the party, numbering in all 79, resolved to carry the body of their leader to Zanzibar; and after subjecting it to a rough process of embalming, they started with it toward Unyanyembe. They underwent great hardships, and as their supplies had nearly given out, they despatched Chumah to procure relief. This being at once furnished by the Cameron party, they successfully reached their destination, and Livingstone's body was finally received at the coast. Thence it was carried to England by a government vessel, and on April 18 was buried in Westminster abbey with distinguished honors.—The vast extent of Livingstone's explorations will be found described at length in the explorer's two works above cited, in reports scattered through the transactions of the royal geographical society, Petermann's *Geographische Mittheilungen*, &c., and in "The Last Journals of David Livingstone, including his Wanderings and Discoveries in Eastern Africa from 1865 to within a few days of his Death," edited by the Rev. Horace Waller (2 vols., London, 1874). (See also the article AFRICA.) Livingstone was the recipient of honors from most of the leading geographical societies of the world. In February, 1869, he was elected a corresponding member of the academy of sciences at Paris. He received several medals and other tokens of appreciation from learned bodies, and the degrees of LL. D. and D. C. L. were conferred upon him. In November, 1871, the British government granted to his family a pension of £300.

**LIVONIA** (Ger. *Livland*), a W. government of Russia, bounded N. by Esthonia, E. by Lake Peipus and the government of Pskov, S.-E. by Vitebsk, S. by Courland, and W. by the gulf of Livonia or bay of Riga; area, 17,801 sq. m.; pop. in 1867, 990,784. It includes the islands of Oesel, Moen, &c., lying at the entrance of the gulf. The surface is generally level or gently undulating, but in the E. portions a

number of hills reach an altitude of from 500 to 1,000 ft. A considerable proportion of the land is occupied by forests and marshes. The soil on the seacoast is very sandy; in the interior, sand, clay, loam, and moorland alternate; but there are many very fertile tracts. There is a large number of lakes, the principal of which is the border lake Peipus (about 1,300 sq. m.), united by a narrow channel with Lake Pskov (about 150 sq. m.) on the southeast, and by the Great Embach with Lake Wirz (about 100 sq. m.), in the middle of the government. The principal river is the Düna, which is the boundary toward Courland, and receives from Livonia the Ewst and the Oger; there are more than 300 smaller streams, among which are the Embach, Aa, Salis, and Pernau. The climate is cold and raw till the end of May, but very hot in the three summer months. Agriculture is the chief industry. The country produces rye, barley, flax, hops, hemp, and linseed. The live stock is generally poor, but some good stock is owned by the nobles. Bears, wolves, lynxes, and foxes are numerous; and on the islands and coast seals are taken, and fish of various kinds are abundant. Potters' clay and limestone are obtained. Coarse woollens and cloths are made, and there are numerous distilleries. The rural population consists of Letts, Livs or Livonians proper, a people of Finnic race, and Esths, of the same race, while Germans, Swedes, and Russians form the nobility, clergy, and burghers; there are also a few Jews. The great majority of the people are Lutherans. The principal towns are Riga, the capital, Pernau, Wenden, Dorpat, which has a university, and Arensburg in the island of Oesel.—Livonia was first made known to western Europe by Bremen merchants about the middle of the 12th century. At the beginning of the 13th the order of knights sword-bearers was founded there, which in connection with the Teutonic order gradually subdued all the territories surrounding the gulf of Riga. The possession of the province was long disputed by Russians, Poles, and Sweden, to which it was ceded in 1660. The treaty of Nystadt in 1721 annexed it to Russia.

**LIVRE** (Fr., from Lat. *libra*, a pound), an ancient French coin dating from A. D. 810, and superseded by the franc in 1795. The livre and franc were originally synonymous as monies of account, but the livre is now reckoned  $1\frac{1}{2}$  per cent. less, or as 81 to 80.

**LIVRY, Emma**, a French dancer, whose real name is EMMA EMAROT, born in Paris in 1842, died at Neuilly in July, 1863. The daughter of a dancer, she first appeared in 1858 at the opera in Paris as Sylphide, and was regarded as a worthy successor of Taglioni, who travelled from Venice to Paris to witness her performance. On Nov. 15, 1862, at a rehearsal of *La muette de Portici*, her dress caught fire, and she died after eight months.

**LIVY** (LIVIVS ANDRONICUS). See ANDRONICUS, LIVIUS.

**LIVY** (TITUS LIVIUS), a Roman historian, born in Patavium (Padua) in 59 B. C., died A. D. 17. All that is known concerning his life is that he resided during the greater part of it in Rome, that he was married and had at least one son and one daughter, that he enjoyed the patronage and friendship of Augustus, that by his advice the future emperor Claudius was induced in early life to attempt historical composition, that his reputation as an author was so widely extended that a Spaniard went from Cadiz to Rome solely for the purpose of seeing him, and that he returned to his native town some time before his death. Besides his history, which is his great work, he wrote epistles, dialogues, and a treatise on philosophy, not a fragment of which remains. His history of Rome, termed by himself *Annales*, was in 142 books, and embraced the period from the foundation of the city to the death of Drusus in 9 B. C. Only 35 of these books have been preserved; but we have dry epitomes of the whole, compiled by an unknown author, probably not much later than the volumes which they abridge, which are valuable as furnishing a complete index to the whole period of Roman history, and as being the sole authority for some periods. The original work has been divided into decades, in groups of 10 books each, from the circumstance that the 1st, 21st, and 31st books mark the beginning of important epochs, and are opened with a short introduction. This division was not introduced until after the 6th century. The 1st decade is preserved entire, extending to the virtual subjugation of the Samnites in 294 B. C. The 2d decade, embracing the period between 294 and 219, is altogether lost. The 3d decade, comprehending the period of the second Punic war, from 219 to 201, is entire. The 15 books which form the 4th decade and the first half of the 5th, and comprehend the period from the conclusion of the second Punic war to the conquest of Macedonia and the triumph of Æmilius Paulus in 167, are entire. The remaining books are altogether lost, with the exception of unimportant fragments, and of a few chapters of the 91st book, concerning the fortunes of Sertorius. The books which are now extant were brought to light at various dates from the revival of learning to the year 1615, the earliest editions having included only 29 books. Many of the fragments have been since discovered, and two of the most interesting of them were first published by Niebuhr (Berlin, 1820). Great exertions were made by Leo X. and by other potentates as late as Louis XIV. to recover the lost decades. Perfect copies were affirmed to exist at Iona in the Hebrides, in Chios, in the monastery of Mt. Athos, and in the seraglio of the sultan; there is reason to believe that such a prize was destroyed at the siege of Magdeburg in 1631, and there is little doubt that the manuscript containing at least the whole of the 5th decade was once in existence at Lausanne. The pursuit, how-

ever, always proved a vain one, and has long since been abandoned. The singular beauty of Livy's style, his easy, graceful, and energetic narrative, his skill in giving full relief to the leading features without neglecting minor incidents, and in maintaining a constant interest while relating a long series of dull events, must strike every reader. His characterizations and his descriptions are alike animated. His speeches, while they have been admired as models of eloquence, have been criticised as too polished and rhetorical to be suited either to the characters to whom they are ascribed or to the audiences to which they are represented as addressed. It does not appear to have been his aim to write a critical history, but rather to give his countrymen a clear and pleasing narrative, and to exalt the fame of the Roman people. He moulded the rude records and fables of the older chronicles into a symmetrical and somewhat poetical form. He never displayed a diligent and painstaking care in consulting authorities and weighing conflicting testimonies. He never ascended to the original sources, tested the records by the monuments of remote antiquity, investigated the antiquities and traditions of the various Italian tribes, or inquired how far the rites and customs of his own time might explain the institutions of the past. He makes mistakes also from lack of a thorough acquaintance with the military art, jurisprudence, political economy, and even geography. These deficiencies, which result in many contradictions and inconsistencies, are not due to want of good faith, but to his indifference to historical thoroughness, and his desire for literary rather than critical elaboration. With the exception of a general tendency to eulogize the heroism of his countrymen and the military glory of Rome, he seems to have written with liberality and impartiality. Quintillian twice mentions a certain "Patavinity" in his style, but scholars have been unable to discover to what he alludes. The best editions are by Drakenborch (7 vols., Leyden, 1738-'46; new ed., 15 vols., Stuttgart, 1820-'28), Alschefski (Berlin 1841 *et seq.*), Bekker (3 vols., London, 1840), Twiss (4 vols., Oxford, 1840-'41), Madvig (Copenhagen, 1861 *et seq.*), and Frey (Leipsic, 1865 *et seq.*). There are English translations by Philemon Holland (London, 1600; best ed., 1686) and Baker (1797), one published by John Hayes (1744-'5), and a literal one forming 4 vols. in Bohn's "Classical Library" (1850).

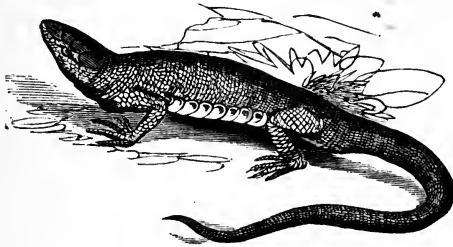
**LIZARD**, the common name of several families of saurian reptiles, but properly restricted to the family *lacertini*, or the autosaurian group of Duméril and Bibron. Many iguanas, geckos, monitors, and skinks have been called lizards; the green anolis and the blue-tailed skink are familiar examples in this country. The lizard may be defined as a scaly reptile, with elongated body; four feet armed with four or five unequal and free toes; long conical tail clothed with scales disposed in



parallel rings; head protected by horny plates, flattened and narrow in front; the tympanum membranous and distinct, and the eyes generally with three movable lids; the mouth wide, surrounded by large scales above and below; teeth of unequal size and shape, inserted on the internal border of a common groove in the projecting portion of the maxillary bones, and frequently also on the palate; tongue slender, free, fleshy, more or less extensible and forked at the point; the scales without prominent crests, those of the abdomen large; the neck without dewlap, but often with one or two transverse folds covered with tubercles or broad scales which form a kind of collar separated from those of the abdomen by smaller ones; the false ribs do not make a complete circle. The family of lizards may be divided into two subfamilies, according to the structure and mode of insertion of the teeth; the first, according to Duméril and Bibron, is the pleodont, and the other the cœlodont; in the pleodonts the teeth are solid, and firmly fixed by their edges and external surface to the jaws in a hollow of the interior border; in the cœlodonts the teeth have an interior canal, and are slightly attached to the jaws. The pleodonts are further subdivided into the flat-tailed and conical-tailed groups, and the cœlodonts into the smooth-fingered and the serrated-fingered groups, distinguished also by their habits. The first group pass most of their lives in the water or inundated places; the second avoid wet situations; the third frequent woods and gardens, and the last dry and desert localities. Nineteen genera are described, established on the form of the tongue and teeth, the situation of the nostrils, the presence or absence of femoral pores, the form and distribution of the abdominal plates, and the characters of the tympanum and collar; for details the reader is referred to the writers above cited. This family is one of the best known among reptiles, as its members are for the most part easily obtained in Europe and America; they vary in length from a few inches to 3 or 4 ft.; the colors are often pleasing, but the tints vary much according to sex, age, and season. Lizards are very rapid in their movements for short distances, both on land and in the water; the loss of the tail is frequent from various accidents, but it is very soon replaced; from their scaly covering the sense of touch must be dull; so also are smell and hearing; the moist and movable tongue indicates greater development of the sense of taste; vision is generally very good. Various shades of green, yellow, gray, black, white, blue, and red are found in the family; the epidermis is ordinarily renewed several times a year, being detached in fragments or plates, and at each moult the colors appear brighter, especially in the males. Lizards drink by lapping; their favorite food consists of insects, terrestrial mollusks, worms, eggs, and for the larger species small birds, reptiles, and mammals; the muscles of the jaws are powerful,

and their bite is severe and long continued; most genera are oviparous, but one genus brings forth the young alive; the flesh of some of the larger species is considered a delicacy in South America. All the pleodonts belong to the new world, and all the cœlodonts to the continents of Europe, Asia, and Africa; the six-lined ameiva only is found in North America. The flat-tailed pleodonts or crocodilurians are among the largest of the family; they may be recognized by the crocodilian form of the tail, surmounted by two serrated crests, a powerful swimming organ; though the feet are not palmated, these reptiles pass most of their lives in the water, the rivers, lakes, and swamps of tropical South America; some attain a length of 2½ ft., of which the tail is about two thirds. Of the conical-tailed pleodonts the best known genus is *ameiva* (Cuv.), numerous in species, not partial to moist places, living on worms, insects, mollusks, and even on vegetable food. The six-lined ameiva (*A. sex-lineata*, Holbr.) is common in the southern states; the usual length is about 10 in., of which the tail is two thirds; the color is dark brown above, marked with six yellow longitudinal lines, and silvery white below. It is very active, frequenting dry and sandy places; it is very timid, and feeds on insects, which it generally procures toward the close of the day. The great American safeguard or teguixin, the largest of the ameiva lizards, grows to a length of more than 4 ft.; it is voracious, and preys upon mice, frogs, and animals of similar size, and its white flesh is esteemed by the Brazilians; it is a swift runner, and when pursued will bite, and strike severely with its tail; it is the *tejus monitor* (Merr.), and frequents the woods and dry places of tropical South America.—The cœlodonts, or hollow-toothed lizards of the old world, are all terrestrial in their habits; the smooth-fingered group are excellent climbers on trees and walls, of mild disposition, and generally looked upon as friends of man. This includes the typical genus *lacerta* (Cuv.), or the lizards properly so called; they have distinct eyelids, femoral pores on the inside of the thighs, and a collar of scales larger than the rest under the throat; the form is generally slender and graceful, and the motions very quick. The European sand lizard (*L. stripium*, Daud.; *L. agilis*, Linn.) has the back reddish brown, sometimes with blackish spots, the sides green with brown spots, and the lower parts chiefly white; it is about 8 in. long, and of rather stout form; it is found in Europe (except in the northern parts), near the Caspian sea, and in Asia, in level and hilly districts, in which it digs a hole at the foot of a bush or tree; it passes the winter in a dormant state, and feeds in the warm season on insects and larvæ; the female lays about a dozen cylindrical eggs. The viviparous lizard (*L. vivipara*, Jacquin; genus *zootoca*, Wagler) is about 7½ in. long, of which the tail measures two thirds; the back is olive or reddish brown,

with a black band on each side bordered with white above and below, and a black dorsal streak along the spine; the under parts are orange yellow with black spots. The tail does not diminish in thickness until about its middle. It is found most frequently in mountainous regions of Europe, but occasionally in dark and damp woods; it is timid, very active, and feeds principally on dipterous insects. Toward the month of June the female lays five to seven eggs, from which the young come forth in a few minutes perfectly developed, and sometimes, it is said, the eggs are entirely hatched within the oviducts. The green lizard (*L. viridis*, Daud.) attains a length of about 18 in., of which the tail is a foot; the color above is either uniformly green, or brown spotted with green, or the latter spotted with yellow, and the under parts yellow; there is considerable variation, and some specimens are marked with white and black streaks. It is generally distributed over Europe (except in the northern parts), northern Africa, and western Asia. The other group of oöodonts



Green Lizard (*Lacerta viridis*).

have the fingers with lateral serrations or inferior ridges, by means of which they can run rapidly over the arid sand in which they live.

**LIZARD'S-TAIL**, a plant with heart-shaped leaves and long, slender, gracefully curving spikes of white flowers, growing in large clumps in swamps and along the margins of ponds and slow rivers from New York westward and southward. The name is simply a translation of the generic name *saururus* (Gr. *σαῦρος*, a lizard, and *οὐρά*, a tail), while the specific name *cernuus* has reference to the nodding habit of the flower spikes. It is a plant likely to attract attention for its neat appearance and its very pleasing fragrance. It is our only representative of a small family, the *saururaceæ*, which in its relationships is close to the pepper family. The flower spike, while pleasing as a whole, will repay a close examination, as it is one of the few instances we have of perfectly naked flowers; the essential parts of the flower, the stamens and pistil, are present, but there is no trace of anything like calyx or corolla; each flower upon the spike is in the axil of a small bract. In some of the southern states the roots of this plant are boiled and beaten up to serve as a poultice; and as they will produce the emollient effects of warmth

and moisture, they may be as useful as any other similar application. Those who have bodies of ornamental water upon their grounds



Lizard's-Tail.

will find the lizard's-tail a charming plant to grow along the margins.

**LLAMA** (*auचना*, Illiger), a ruminant animal representing the camel family in the western hemisphere. The dentition is as follows; incisors  $\frac{2}{2}$ , the upper placed at the side of the intermaxillary bone close to the canines, which they much resemble; of the six lower incisors, the four median are very broad, curved, and gouge-shaped, the two external near to and resembling the canines; canines  $\frac{1}{1}$ ; molars  $\frac{2}{2}$ . There is no hump on the back; the soles are divided into two toes, each with a strong horny nail or hoof with a thick pad beneath; the ears long, pointed, and movable; the upper lip is swelled and cleft, the head camel-like, the orbits prominent, and the nose small; the form is less heavy and the appearance less stupid than in the camel; the head is carried nearly perpendicular; the size and strength are much inferior to those of the camel; there is a conformation resembling the camel's hump in the shape of a thick bed of fat under the skin; as they kneel down like the camels, they have callosities on the knees of the fore legs; the stomach has a system of superficial cells, which in some degree may be considered equivalent to the water reservoirs in the camel. The structure of the feet is not adapted for travelling on sandy wastes, but for securing a firm hold among the mountains where they dwell; their native region is the slopes of the Andes, especially in Peru, and, though in a tropical latitude, often within the limits of perpetual snow. In the wild state they are vigilant and shy, living in flocks upon the mountains, and descending into the plains in search of food. When irritated they eject the contents of their mouth, which are very disagreeable, upon their

assailant; they have the habit of dropping their excrement in particular spots, and from this propensity the natives are able to collect considerable quantities, which they use as fuel. There appear to be three species of the genus, viz.: the wild guanaco (*A. huanaco*, Tschudi), of which the llama is probably the domesticated variety; the alpaca or paco (*A. alpaca*, Tschudi), described in its alphabetical order; and the vicuña (*A. vicugna*, Tschudi). These are easily tamed, and are susceptible of considerable attachment to their keepers. The guanaco is found in the Andes from northern Peru to the neighborhood of the straits of Magellan, in the former inhabiting the mountains in small companies, but in Patagonia frequenting the plains in considerable herds. About 3 ft. high at the shoulder, the head is carried at the height of about 5 ft.; the color is reddish brown, and the hair tolerably long; they are hunted for the skin and flesh. Living mostly at an elevation of 8,000 to 12,000 ft. above the sea, they feed chiefly upon tough grassy reeds, mosses, lichens, and such shrubs as will grow at low temperatures; they do not require drink as long as succulent herbage can be obtained; their chisel-shaped and strong lower incisors, interlocking with the upper teeth and meeting the firm pad of the upper jaw, enable them to feed upon vegetable substances too hard for ordinary cattle; and their long neck, cleft lip, pointed nose, and extensible tongue permit the collection of food in the interstices of rocks, and from the tops of tall shrubs. Sensitive to heat, they increase in situations where an arctic temperature prevails, even though under a tropical sun, far above the abodes of man. The young may be hunted with dogs and the lasso, but the adults must be shot; the flesh of the young is tender, but that of the old only

varied with black, white, gray, and other colors, as in other domesticated animals. From the elevation of the abdomen in the pelvic region the posterior portion of the body seems weak; 90 or 100 lbs. is as much as they can easily carry, but the ability to travel over rugged declivities made them valuable beasts of burden to the natives; their place is now to a great extent supplied by mules; their rate of travel is only 10 or 15 m. a day. They are valued principally for their long woolly hair, from which the Indians make articles of clothing; the skin makes good leather, the dung is used for fuel, and the flesh and milk as articles of food. They require very little care; at night they are put into an enclosure, where they sleep without protection, though the temperature falls even in summer below the freezing point; allowed to wander among the mountains during the day in search of food, they return like cattle at night to their enclosures. The alpaca, noticed under that title, considerably smaller than the llama, is domesticated by the Peruvians, though not used as a beast of burden; it is valued principally for its long and silky hair, which is made into the fine cloths familiar to all. The vicuña is the smallest species, about 2½ ft. high at the shoulder; the color is reddish yellow on the back, and whitish on the belly; it is a wild animal, of great value for its very fine hair. The llama and alpaca have a period of gestation of 11 or 12 months, and only one is usually produced at a birth; they are weaned when six months old, and begin to bear at the age of two years; the former are not put at work till the end of the third year. From the fact that when the three animals above mentioned can be made to breed together the offspring is sterile, it is inferred that they constitute different species; these hybrids are much handsomer and have longer and heavier fleeces than the original stocks.—There have been several attempts to introduce the llama into the United States and Europe, but as yet with little success; though thriving for a time on the usual food of cattle and sheep, they begin to fail unless they can browse on the inferior kinds of grass, with a supply of succulent roots instead of rich food and grains; in Peru, maize or millet in the soft milky stage is frequently given to them; in Chili they eat a coarse clover, and here would thrive on the same, as well as pea vines, bean stalks, buckwheat straw, and such other coarse food as our cattle would reject; they invariably suffer from disease of the skin when confined in low places, and can only be restored by pure mountain air and frequent bathing. A sketch of the attempts to introduce the llama into the United States is given in the agricultural portion of the patent office report for the year 1857; none of these having been successful, probably from the unsuitableness of the climate and elevation in the Atlantic and gulf states, it is there advised to place them on the vast and high plains to the east of the Rocky mountains, be-



Llama (*Auchenia lama*).

fit for drying and salting. The domesticated llama (the *A. lama* of such as consider it a distinct species) takes the place of the camel and the horse among the Indians of Peru and Chili. It is of about the size of the guanaco, but of somewhat more compact form, and the hair is

tween lon. 20° and 30° W. from Washington, extending from Texas to the arctic regions; here the nature of the soil, the climate, and the herbage (particularly the buffalo grass) seem specially suited for the llama; here, with the herds of wild cattle, horses, buffaloes, antelopes, deer, and other ruminants, if unmolested for a few years, they would probably increase immensely, affording a great source of wealth in their skins, flesh, and wool, besides being useful as beasts of burden in places inaccessible even to mules. In the autumn of 1857, 38 llamas were imported into New York from Peru, and having been kept during the winter at the "Dyckman farm" in the city, near King's Bridge, were offered at auction in March, 1858. The flock was 72 when it started from Peru; exposed to the perils of the isthmus of Panama in the hottest season, to the railroad transit, and to a crowded passage in a small vessel, with insufficient and improper food, it was no wonder that about half of them died before reaching New York. They wintered as well as sheep of the same condition, though fed on dry forage; the flock were all broken to the halter and the pack, and were docile, tractable, intelligent, in color resembling brown and black sheep; they did not bring \$100 each (the price demanded) at this sale, though some were subsequently sold to go to Australia at a little more than this; what became of the flock is not definitely known. The wool of the llama, 4 to 6 in. long, fine and soft, with a few longer coarse hairs, resembles that of a black sheep; an average fleece will weigh 10 lbs., and its value is great.

**LLANELLY**, a parliamentary borough and seaport of Wales, on the river Burry, in the county and 14 m. S. by E. of the city of Carmarthen; pop. in 1871, 15,281. The town is on the railway from Carmarthen to Swansea, and is connected with several other lines, and there is a canal to Kidwelly, 8 m. N. W. Llanelly is irregularly built, but is well paved and has gas and water works. It has a parish church, several dissenting chapels, and a large prison. It is the emporium of a great mining district, which produces iron, copper, lead, silver, and especially coal. It contains copper and iron founderies and a pottery, and has four large docks from which enormous quantities of coal are shipped to foreign ports. In 1871 the entrances were 1,912 vessels, tonnage 102,127; the clearances 618 vessels, tonnage 75,701.

**LLANO**, a central county of Texas, bounded E. by the Colorado river, and intersected by Rio Llano; area, 900 sq. m.; pop. in 1870, 1,379, of whom 18 were colored. Iron ore is abundant, and gold and silver have been found. The county is subject to droughts, and farming is not much pursued, grazing and the raising of swine being the principal pursuits of the inhabitants. The chief productions in 1870 were 23,504 bushels of Indian corn and 12,179 lbs. of wool. There were 443 horses, 1,687 milch cows, 18,360 other cattle, 4,608 sheep, and 6,798 swine. Capital, Llano.

**LLANQUIHUE**, a province of Chili, bounded N. by Valdivia, E. by the Andes, S. by a strait separating it from Chiloe and the gulf of Ancud, and W. by the Pacific; area estimated at 8,350 sq. m.; pop. in 1870, 43,342, many of whom are Germans. It comprises an extensive plain, nowhere more than 90 ft. above the sea, covered with forests affording useful timber, and interspersed with picturesque lakes, the largest of which is that of the same name, about 30 m. long and 15 m. wide; in shape it is an irregular triangle, and its waters are discharged through the river Maullin into the Pacific. The climate of Llanquihue is mild and healthy; and the soil, owing to successive deposits of vegetable matter and a pteuous irrigation by countless streams, is extremely fertile. Large quantities of potatoes are produced, besides wheat and other grain. All the European fruits and vegetables abound, and cattle and swine are numerous. Coal has been discovered in the south, and good roads facilitate transportation to the coast. There are about 50 free public schools in the province. Capital, Puerto Montt, which was incorporated in 1861.

**LLORENTE**, Don Juan Antonio, a Spanish author, born near Calahorra, March 30, 1756, died in Madrid, Feb. 5, 1823. He studied at Tarragona and Madrid, in 1779 was ordained priest, and in 1782 became vicar general of the bishop of Calahorra. In 1784, as he says, he had arrived at the conclusion "that there is no authority outside of us which has the right to subjugate our reason." Notwithstanding these views, he accepted in 1785 a situation as commissary, and in 1789 as secretary general of the inquisition. By the liberal inquisitor general Manuel Abad de Sierra he was intrusted with the task of drawing up a plan of a total reformation of the inquisition, but this attempt failed. A second attempt, made by Llorente in union with the bishop of Calahorra and the minister of justice Jovellanos, was no more successful, and ended in the exile of Jovellanos and the arrest of Llorente. He was, however, recalled to Madrid in 1806 by Godoy, who commissioned him to write, in favor of a greater centralization, a work against the old liberties of the Basque provinces (*Noticias históricas sobre las tres provincias Vascongadas*, 3 vols., Madrid, 1806-'8). Several lucrative offices were the reward of this work. After the invasion in 1808 Llorente became one of the most devoted partisans of the French. King Joseph made him a state councillor, and on the suppression of the inquisition placed all the papers of that tribunal at his disposal, and charged him with writing its history. For two years Llorente was occupied, aided by several assistants, in copying the most important documents. At the same time he was charged with the execution of the decree which abolished all convents, and also accepted the supreme administration of the so-called national property. He was accused of having embezzled 11,000,000 reals, and lost his offices for a

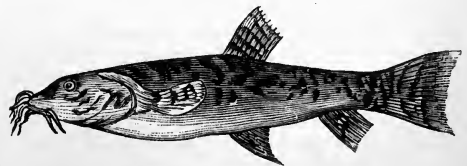
time; but as the accusation could not be proved, he was restored. Being exiled as an adherent of the French by Ferdinand VII. in 1814, he went to Paris, where, after a short journey to England, he took up his permanent abode. Here he finished his "History of the Spanish Inquisition," published in Spanish, but at the same time translated into French under his superintendence by A. Pellier (*Histoire critique de l'inquisition d'Espagne*, 4 vols., 1817-'18). The accuracy of his citations from the documents of the inquisition has been disputed by modern Catholic writers, especially Hefele in his "Life of Ximenes;" but Protestant historians are generally of opinion that no sufficient reason has yet been adduced to doubt it. Immediately after the publication of this work he was suspended from ecclesiastical functions. He then endeavored to support himself by giving instruction at a literary institution in Paris, but this also was soon forbidden by the Paris university. In 1822 he published his *Portraits politiques des papes*, and being ordered by the government to leave France, he returned to Madrid, where he found a cordial reception, but died soon afterward. Besides the works already mentioned, he published *Mémoires pour servir à l'histoire de la révolution d'Espagne*, par Nellerito, an anagram of his name (3 vols., Paris, 1815-'19); *Discours sur une constitution religieuse* (2 vols., 1819); *Œuvres complètes de Barth. de Las Casas* (2 vols., 1822); and *Observations critiques sur le roman de Gil Blas* (1822), in which he sought to prove that Le Sage took his celebrated work from a Spanish manuscript. He wrote an autobiography, *Noticia biográfica* (Paris, 1818), which was reprinted in full in Mahul's *Annuaire nécrologique* (1824).

**LLOYD, Henry**, an English soldier, born in Wales in 1729, died in Huy in the Netherlands, June 19, 1783. He was present at the battle of Fontenoy (1745), entered the Austrian service during the seven years' war, and rose to the command of a body of cavalry, but resigned his commission and joined the army of Frederick the Great. He made two campaigns as aide-de-camp to Prince Ferdinand of Brunswick, and on the commencement of hostilities between Russia and Turkey in 1768 he entered the Russian service as major general. He distinguished himself at the siege of Silistria and elsewhere, and subsequently participated with credit in the war with Sweden. After more than 30 years' absence he returned to England, and wrote "The History of the late War in Germany" (2 vols. 4to) and "A Treatise on the Composition of different Armies, Ancient and Modern," besides a memoir on the "Invasion and Defence of Great Britain and Ireland," which appeared after his death.

**LLOYD'S**, the name of subscription rooms on the first floor of the London exchange, where merchants, shippers, and underwriters attend to obtain shipping intelligence, and where the business of marine insurance is carried on.

One large room with small rooms attached to it is occupied by the underwriters, the object of whose association is to limit the interest of every individual underwriter to a moderate amount, say £50, £100, or £150, rarely exceeding £200; so that in case of casualties the loss, instead of falling upon one, is divided among hundreds. The underwriters of Lloyd's have agents in all parts of the world to report casualties and to attend to their interests. Their affairs are managed by a committee of 12 members; the chairman is elected annually. Another large room, called the merchants' room, is provided with newspapers from all parts of the world, and open to subscribers, who for the use of this room alone have to pay two guineas, and for the whole establishment four guineas annually. The third room is called the captains' room, to which a bar is attached, where captains and merchants meet in a more social manner, and where ship auctions are held. In 1716 the association commenced the publication of a weekly journal known as "Lloyd's List." Since 1800 it has appeared daily, and always contains the latest shipping intelligence.—This use of the name Lloyd or Lloyd's arose from the circumstance that the headquarters of the London underwriters were originally in Lloyd's coffee house; it has now become a generic term for similar associations in many parts of Europe. The Trieste or Austrian Lloyd's was established in that city in 1833 by C. L. von Bruck, who afterward became minister and baron. At first it was devoted to the insurance business, and subsequently it also became the agency of steamers to the Levant and the Mediterranean, and other parts of the world. In 1849 a third department was connected with it, embracing literature and art, with the aid of lecture and reading rooms, and a printing and publishing establishment. The organ of this institution is the *Giornale del Lloyd austriaco*, which in 1874 was in its 40th year. Next in importance to this is the North German Lloyd's (*Norddeutscher Lloyd*) at Bremen, chiefly in connection with emigration to the United States and transatlantic steamers.

**LOACH**, a soft-rayed cyprinoid fish, of the genus *cobitis* (Linn.). The common loach of



Loach (*Cobitis barbatula*).

Great Britain (*C. barbatula*, Linn.) is 3 or 4 in. long, with a small head, elongated body very little narrowed at the tail, and covered with minute and slimy scales; the mouth is small, without teeth, the upper lip having four barbules in front and one at each corner; the



ventral fins far back, placed under the single small dorsal; gill openings small, and branchiostegous rays three. It is common in shallow clear streams, where it delights to lurk under stones, and is very restless and active when disturbed. Like other species with barbules, it is a ground fish, feeding on worms and aquatic insects; a common name for it is mud creeper; it is very prolific, spawning in March or April, and its flesh is considered a great delicacy. The air bladder is contained in a bony cavity attached to the anterior vertebræ, and is supposed by Weber to be connected with the organ of hearing; there is also said by Yarrell to be a deficiency in the upper wall of the skull between the parietal bones. The spined loach (*C. tania*, Linn.; genus *botia*, Gray) is rather smaller and more slender, without barbules, but with a forked and movable spine behind each nostril on the suborbital bone; this is a rarer fish in Europe, but several allied species are found in the Ganges. The color in both these species is yellowish white above, clouded and spotted with brown, but unspotted beneath. The lake loach of Europe (*C. fossilis*, Linn.) is about the same size. All the species of loach are peculiarly restless during stormy weather, especially when accompanied by thunder and considerable electrical changes in the air; they have been regarded as a kind of living barometers, which, from their being ground fish with a low degree of respiration and consequent great muscular irritability, may be explained on philosophical principles; the peculiarity of the air bladder may enable them to perceive thunder either by the sense of hearing or feeling. According to some writers the lake loach, which is very tenacious of life, comes to the surface in order to swallow air, from which it extracts the oxygen, giving out carbonic acid by the vent, performing a kind of supplementary intestinal respiration. The four-eyed loach or peeper, ranked by Linnæus in the genus *cobitis*, but now placed in the genus *anableps* (Artedi), has been described under the latter title.

**LOADSTONE**, magnetic oxide of iron, or the native magnet. See IRON ORES, vol. ix., p. 412.

**LOAN**, in law, the delivery of an article to a borrower, who is to use it without paying therefor. The rights and obligations of the lender and of the borrower may be considered separately. I. *Rights of the Borrower*. He has a right to receive and hold the thing borrowed, but only as the property of the lender. For many purposes his possession is, in the eye of the law, the possession of the owner, the borrower being for this purpose the agent of the owner. Still the possession of the borrower would confer upon him some of the rights of an owner as against every one but the owner. Thus he might maintain in his own name an action against a wrong doer. The borrower has a right to use the article borrowed, but he can no more lend it than he can give or sell it; and if he should do either of these,

the owner may take it as his own property from the hands of the person to whom the borrower has delivered it. Neither can the borrower pawn the thing borrowed, nor, it is believed, can he hold it as a security for a debt due to him from the lender; nor can he use it except for purposes for which he borrowed it, or for those which naturally belong to it, or, as it is expressed in the code of Louisiana, for its "natural destination." It is important to determine what degree of care a borrower must take of the article borrowed; or, in other words, for what loss of or injury to it he is responsible. A loan is a bailment, but it is one for the sole and exclusive benefit of the borrower; therefore it is one which binds the borrower to the utmost care of the thing, and to a responsibility for even slight negligence. How this care may be precisely defined, it would not be easy to say. The best definition, or that most generally accepted, is, such care as any person not fatuous would take of the thing if it were his own property under like circumstances. But he is not bound to take the greatest possible care, and therefore is not liable if the borrowed property were lost by robbery or violence, or theft, or any cause not reasonably to be anticipated, provided no imprudence or negligence of his own enters as a cause into the loss. If the thing is lost, and the borrower pays for it to the satisfaction of the lender, and the thing is afterward found, we should say that the lender may elect to keep the money (always supposing no fraud) or to return it and demand the thing lent. But it has been thought that this election lay with the borrower. As the borrower takes the thing to use, and the lender consents to this, the borrower is not liable for such injury as naturally results from the use of it; or, to use a common phrase, from the natural wear and tear of use. But, on the other hand, he is bound to pay all the expenses or charges which naturally result from or accompany the use. So he is bound to pay, in the first place, all extraordinary charges which become unexpectedly necessary to the preservation of the thing. But of these expenses he may demand repayment from the lender, and he has a lien on the thing borrowed as his security for them. Thus, if A borrows a horse of B, A must see that he is properly fed, shod, and groomed, and all this at his own expense. So if the horse becomes suddenly ill, A must provide all proper medical advice and medicines, and for these also he must pay; but he may demand them of B, whether the horse lives or dies; and if he lives, A may keep the horse until B repays him these expenses, in the same way he would if it were pledged to him for the sum. II. *Rights of the Lender*. If a borrower keeps the thing borrowed after it is his duty to return it, his relation to the owner is changed at once; and it is therefore necessary to determine when he is bound to return it. Upon the important right of redemanding the thing lent

at pleasure, the Roman civil law held a different doctrine from our own common law. By that law, if one lent a thing for an indefinite period, he might reclaim it when he would, or perhaps within any reasonable time. But if he lent it for a time certain, this was a valid contract, and the borrower had a right to retain it against the will of the lender during that time. The common law however does not regard it as a valid contract, for the reason that no consideration passes; and therefore the lender, however specific may have been the terms of the loan, may rescind and cancel them at his pleasure and demand a return of the thing. Now, we have seen that if the borrower keeps the thing after he was bound to return it, his relation to the lender changes totally; and this change takes place as soon as a definite period for which the thing was lent expires, whether the thing be demanded or not; and as soon as it is demanded, whether the period for which it is borrowed have expired or not. Hence, as soon as it should be returned and is not, the borrower becomes at once liable for any loss or injury, although wholly without his fault; as if, for example, he had kept it when he should not, and then was robbed of it by overwhelming force. In fact, if he keeps it when he should return it, he holds it entirely without right, and is just as liable as if he had originally taken it without right. A lender has no right to compensation for want of the care or skill which he had no right to expect. Thus, it has been said in illustration of this rule, that if one lends a fiery horse to one who ought not to be supposed capable of using it with safety, the lender has no claim for compensation for damages caused by the want of the extraordinary skill or strength required. By the same reason, if a lender knows of defects or tendencies to mischief in the thing lent which are not obvious, and does not disclose them, he has no claim for damages thence resulting. And if he lends the thing for an illegal act, he is no longer a lender in the eye of the law, but an accomplice in the wrong done.—In all that we have said we have considered as a loan only that which is so by legal definition. But the common use of the word is very different. Thus one is said to lend his money for so much per cent., or to lend an article for such a compensation. But the moment any compensation of any kind is paid by the borrower, it ceases totally from being a loan, and becomes a contract of hiring, which is an altogether different thing. The Roman civil law, in its exquisite classification, recognized another form of loan, under the name of *mutuum*, for which we have no word in English, either in law or in usage. A loan, in law, is a delivery for use by the borrower, as already defined; but a *mutuum* may be defined as a loan for consumption, and not for use. Thus one lends so much bread, or wood, or wine, which the borrower is to use at his pleasure, and in the use consume, and repay by an equal quantity of a similar article. But no

compensation whatever is to be made, or this also would become, instead of a *mutuum*, a hiring. Such contracts cannot be uncommon in practice, and would undoubtedly be governed by the same rules as the contract of loan, varied only as the different nature of this contract required. It is obvious also that a contract might be in part a loan, and in part a *mutuum*. Hence if A lent B a cask of wine for a certain occasion, B to use what he chose, and to repay that by a similar quantity, and to return the rest, this would be a *mutuum* as to all that was used, and a loan as to all the remainder.

**LOANDA, St. Paul de.** See ST. PAUL DE LOANDA.

**LOANGO**, a kingdom in Lower Guinea, on the W. coast of Africa, N. of the embouchure of the Congo or Zaire. The name is generally applied also to the entire coast land between Cape Lopez and the Congo. Of the three kingdoms now existing N. of the mouth of the Congo, viz., Loango, Kabinda or Angoy, and Kakongo, the first is the most powerful, and exercises at times a sort of supremacy over the others; but all three are supposed to have been not long ago dependencies of the king or emperor of Congo. The river Loango, called also Kakongo or Chiloango, is formed by the junction of the Lukulla and the Loango Luiz or Ruiz, and separates the territories of Loango and Kakongo. The northern and larger portion of Loango is known as Great Loango or Boali, the other as Little Loango or Chiloango. E. and N. of these coast lands lies a vast forest land, indefinitely and generally designated as Mayumba, which seems to constitute the slope of a range of mountains. Through the northern portion of Loango flows the Quillu. The rulers of these kingdoms are mere tools of the fetich priesthood, and their actions are in the minutest details controlled by innumerable *quixilles*, or prohibitions, resembling the Polynesian laws of *tabu*. In recent times it has been very difficult to find a person willing to fill the post of king, and sometimes the throne is vacant for years, during which time the coffin of the deceased king remains unburied, and the priesthood rules in his name. There are numerous European factories or trading posts on the coast and rivers. Commerce is carried on principally in oil, gum, wax, ivory, coffee, cotton, dye woods, and copper.

**LOBAU, Georges Monton**, count de, a French soldier, born in Pfalzburg in 1770, died in Paris in 1838. He enlisted as a volunteer in 1792, was aide-de-camp to Joubert in 1798, and to the emperor in 1805. He obtained the rank of general of division in 1807 at the battle of Friedland; stormed Mérida in Spain in 1808, and contributed to the fall of Burgos; distinguished himself at Eckmühl and Essling in 1809, and by his indomitable firmness preserved a corps that had been left on the island of Lobau, whence he received his title. He accompanied Napoleon in his Russian campaign, and after the disastrous retreat assisted in the for-

mation of a new army. After the battle of Leipzig he was a prisoner in Hungary until the first restoration. He joined Napoleon on his return from Elba, was appointed commander of the first military division, headed the sixth corps at Waterloo, and fell into the hands of the English. He was not permitted to return to France till 1818, and for the ten following years he lived in retirement. He was elected to the chamber of deputies in 1828, took an active part in the revolution of 1830, and was made a peer, commander-in-chief of the national guard in December, and in 1831 marshal of France. He suppressed the republican insurrections in 1832 and 1834.

**LOBEIRA**, or *Lobeira*, *Vasco de*, a Portuguese writer, born in Oporto about 1270, died in 1325, according to Bousterwek, or at Elvas in 1403, according to Ticknor. In 1386, according to the latter, he was knighted by John I., on the field of battle at Aljubarotta. He is however almost solely known as author of the celebrated romance "Amadis de Gaul." Southey, who translated it, has apparently proved that it was original with Lobeira. The Portuguese manuscript existed till 1753, and it probably perished in the earthquake and fire which destroyed the Aveiro palace at Lisbon.

**LOBEL**, or *De Pöbel*, *Matthias*, a Flemish botanist, born in Lille in 1538, died near London in 1616. He emigrated to England, superintended for some years a garden of medicinal plants at Hackney, and ultimately became physician and botanist to James I. The most important of his works are *Stirpium Adversaria Nova* (written in conjunction with Pena, London, 1570), and *Plantarum Historia* (Antwerp, 1576), a systematic illustrated work.

**LOBELIA**, a genus of plants named by Linnaeus in honor of Matthias Lobel; it is the type of the order *Lobeliaceæ*, which includes some half dozen other genera besides this. The lobelias are herbs, with milky juice and alternate leaves; the flowers are axillary or in bracted racemes; the calyx tube is adherent to the pod, with a five-cleft limb; corolla monopetalous, split down its whole length, somewhat two-lipped, the upper lip of two erect lobes, the lower lip spreading and three-cleft; stamens united into a tube by their anthers, and sometimes by their filaments; pod two-celled, many-seeded, opening at the top. This structure with slight modifications runs through the order, which is closely related to the *campanulaceæ*, scarcely differing from it except in its irregular flowers; the structure of the flowers is much like that in *compositæ*, from which they differ in the many-seeded capsule. Acrid and narcotic qualities pervade the whole order, some members of which are eminently poisonous. The genus *Lobelia* is a large one, and is especially well represented in tropical and sub-tropical countries; about 15 species are found in the United States east of the Mississippi river. The most conspicuous of our lobelias, and one of the most noticeable of all our wild

flowers, is *L. cardinalis*, the cardinal flower, which is common in wet places from Canada to Florida; in favorable situations this throws up numerous leafy stems 3 or 4 ft. high, the



*Lobelia cardinalis*.

upper part of which is flower-bearing, forming a one-sided raceme a foot or more long of large flowers, which are almost unrivalled in the intensity of their scarlet color. Specimens have been found in which the flowers are rose-colored or even white. The cardinal flower is perennial by offsets; *i. e.*, the stems die after flowering; but during the season offshoots are formed which continue the clump if not the individual plant. So showy a plant early attracted attention, and it was introduced into



*Lobelia inflata*.

English gardens in 1629, where it has ever since been appreciated as one of the finest perennials; it is rarely seen in our gardens, but its cultivation presents no difficulties if the

soil is rich and loamy; in sandy soil it soon runs out. Another showy species, found in similar localities, is the great lobelia, *L. siphilitica*, so named because the Indians attributed medicinal qualities to it; this is a tall species with large blue flowers, but it is not so showy as the other, the flower spike being leafy. These species have been hybridized, and with the intermixture of other species have produced a number of fine garden varieties, bearing florists' names, which present a great range of color, and some of them are handsomely variegated. The Indian tobacco, *L. inflata*, is the most noted of our lobelias, on account of its medicinal activity, and the controversies to which its employment has given rise; it is an annual, 6 to 18 in. high, and much branched, the branches bearing numerous small blue flowers; the pod has an inflated appearance, which is recognized in its specific name, and contains numerous very small seeds. This species has a wide range, and is often common in sandy soil; it is known in some parts of the country as eyebright. It contains a peculiar, volatile liquid alkaloid, lobelina, and lobelic acid. This herb is a violent emetic, its action being attended with continued and distressing nausea and great general prostration. It has been extensively used by the so-called Thomsonian or botanic practitioners. Probably many deaths have resulted from its incautious or reckless administration. It is comparatively little employed at present, even in the diseases to which it is most suited, that is, affections of the respiratory organs involving a spasmodic element. It is said to have been used by the American aborigines. It may be given in substance, tincture, or infusion. The dose of the substance is from 1 to 20 grs.; of the tincture, 10 drops to half a drachm. *L. cardinalis* has been supposed to possess anthelmintic properties. The other native species have but little general interest. The water lobelia (*L. Dortmanna*) may be found on the borders of ponds, with its leaves, which are tubular, all in a submerged cluster at the root; the slender stem, which projects about a foot above the surface, has a few scattered light blue flowers.—Among the exotic lobelias cultivated for ornament are *L. fulgens* and *L. splendens*, garden plants of similar habit to our cardinal flower, but inferior to it in color; both these are from Mexico, as is *L. laxiflora*, a tall red- and yellow-flowered greenhouse species; the low, spreading *L. erinus* is from the Cape of Good Hope; its slender stems bear an abundance of blue flowers, or in the various garden forms white and rose-colored flowers; this is an annual, but is readily continued by cuttings, and is a favorite in both greenhouse and border culture; a double variety, probably of this, has recently appeared in Europe. The seeds should be sown on a pot of light rich soil, with a smoothed surface, and not covered, but merely pressed into the soil with some flat surface; the pot should then be covered with a pane of glass

to prevent the earth from drying. Most of the species are readily propagated by cuttings, or by division of the clumps. Among the *Lobeliaceæ*, species of *siphocampylos*, *isotoma*, and *tupa* are cultivated for ornament.—By far the most remarkable of the *Lobeliaceæ* are found on the Hawaiian islands, where they become arborescent. Six genera, four of them peculiar to the islands, are represented by 37 species. The *L. macrostachys* has a simple stem 4 to 8 ft. high, crowned with a head of dependent leaves from whose top spring many branches covered with light pink flowers, an exceedingly showy plant. *Cyanea superba* and the sweet-scented *Brighamia insignis* are most desirable for cultivation, and the latter plant, although lately discovered, has been raised from seed in England. Most of the tree lobelias have a viscid juice, formerly much used by the natives for bird lime.—On account of their acrid juice, all the plants of the order are to be looked upon with suspicion; unpleasant consequences are said to have resulted from carelessly holding bits of the greenhouse species between the lips. The activity of *L. inflata* has already been referred to; *isotoma longiflora*, of the West Indies, is reputed to be a deadly poison to horses, and the *tupa Feuillei* of Chili furnishes a dangerous venom.

**LOBLOLLY BAY**, the common name for shrubs or trees of the order *camelliaceæ* and genus *Gordonia*, a name which commemorates both Dr. James Gordon, an eminent Scotch physician, and Alexander Gordon, a London nurseryman well known in the last century. There are two species in the southern states, *G. lasianthus*, which grows from Virginia to Florida, and westward; and *G. pubescens* (formerly



Lobolly Bay.

called *Franklinia* in honor of Benjamin Franklin), which, being very local in southern Georgia and the adjacent part of Florida, is comparatively little known, and does not appear

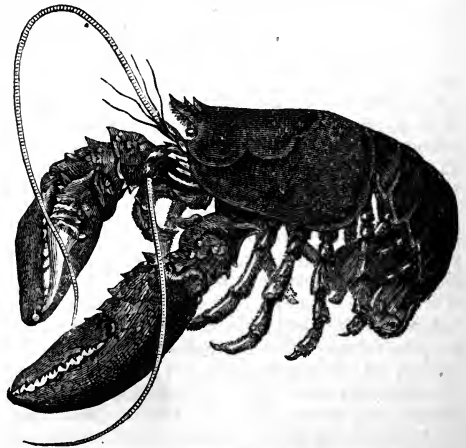
to have received a distinctive popular name. *G. lasianthus*, which is found only as a shrub in Virginia, in favorable localities further south reaches the height of 30 or even 50 ft. The lanceolate-oblong leaves are narrowed at the base, thick and evergreen; the flowers are on axillary peduncles, large, showy, white, about 2 in. across, and with the general aspect of a single camellia; the stamens are united at the base to a five-lobed cup, which adheres to the base of the petals; the fruit is an ovoid, five-celled capsule, opening by five valves, with two to eight seeds in each cell. *G. pubescens* differs in having deciduous leaves, its stamens attached to the petals, and the manner in which the capsule opens. The wood of the loblolly bay is considered of little value; it has a fine mahogany color, but its grain is too coarse for cabinet work. The bark of the tree is rich in tannin, and is nearly if not quite equal to oak for making leather. Both species flower when quite small, and are desirable ornamental plants wherever the climate is not too severe. *G. pubescens*, being deciduous, is more hardy than the other, but neither is to be relied upon where the winters are much colder than at Washington.

**LOBO, Jeronimo**, a Portuguese missionary, born in Lisbon about 1595, died there, Jan. 29, 1678. He entered as a novice the order of Jesuits in 1609, and in 1621 was made a professor in the Jesuit college at Coimbra. In 1622 he was sent as a missionary to India. He remained at Goa till 1624, when he sailed for the African coast, with the intention of penetrating into Abyssinia. His first attempt failed, but in 1625 he disembarked at a port of the Red sea, entered Abyssinia, and took up his abode there as superintendent of Catholic missions. During the lifetime of the sovereign then reigning he enjoyed protection, but the next Abyssinian monarch persecuted the missionaries, who were compelled to leave the country in 1634. The exiles fell into the hands of the Turks at Massowah, and Lobo had to return to India in order to procure funds to effect their ransom. Having accomplished this object, he embarked for Portugal to submit their case to the Portuguese government, and endeavor to rouse it to undertake a crusade against Abyssinia. After undergoing shipwreck and captivity he arrived at Lisbon; but finding that he could not induce either Portugal or the other Catholic powers to assent to his views, he reëmbarked for India in 1640, and was subsequently rector and provincial of the Jesuits at Goa. In 1656 he sailed once more for Lisbon, and there passed the rest of his life chiefly in literary pursuits. He published an account of Abyssinia, and of the Catholic missions there, under the title of *Historia de Ethiopia* (Coimbra, 1659). An English translation by Dr. Johnson, from the French, was published in London in 1735.

**LOBOS (or Seal) ISLANDS**, three islands in the Pacific near the coast of Peru, and belong-

ing to that country. The principal island, Lobos de Tierra, is in lat. 6° 29' S. and lon. 80° 52' W., and is 5 m. long and 2 m. broad. About 30 m. S. S. E. of Lobos de Tierra, and separated from each other by a channel a few hundred feet wide, are the Lobos de Afuera, each from 1½ m. to 2 m. long by less than 1 m. in breadth. There is good anchorage near the larger island, and two safe and capacious bays at the smaller islands. The sheltered parts of these islands are covered with guano, the product not only of birds, but of the seals which frequent them, and from which they are named. The quantity of the deposit on the whole group is estimated at 2,000,000 tons. In 1851 a controversy respecting the title to these islands sprung up between the government of Peru and that of the United States, the latter claiming them in consequence of their alleged discovery by an American vessel in the early part of this century. On investigation, however, the claim of Peru to them was established, and admitted by the American and British governments.

**LOBSTER**, a well known marine crustacean, of the order *decapoda* and genus *homarus* (Milne-Edwards). The common lobster of the United States (*H. Americanus*, Milne-Edwards)



American Lobster (*Homarus Americanus*).

has the general form of the crawfish, heretofore described, but may be distinguished by its larger size, marine habitat, narrow and spiny rostrum, and greatly developed anterior claws. The rostrum is sharp, turned up at the point, furnished with spines at the base, on the sides, and beneath, and with a slight furrow on the dorsal surface. The shell, which is olive or blackish green with darker spots and blotches, as is well known, becomes red by boiling, from the action of the heat upon its pigmentary matter; acids and alcohol produce a similar effect, but all in a manner not perfectly understood, except by the further oxidation of the coloring matter. This horny, many-jointed, external skeleton, being non-extensile, is changed

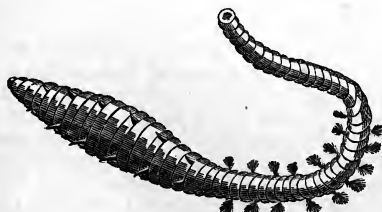


periodically as the animal grows; it splits in two on the head and body, the new one forming underneath in two equal halves, the tail being shed without splitting; in this condition of the shell, which is soft as paper, the animal is defenceless, and hides in crevices in the rocks to escape destruction by voracious fishes and its own species. The eyes are placed on the end of two peduncles, movably inserted on the anterior border of the head; the external antennæ are very long and many-jointed, the seat of a delicate sense of touch, and at their base is a hollow process supposed to be the seat of the sense of hearing; there is also a pair of smaller median antennæ, in whose basal joint is generally placed the sense of smell. The first three segments of the thorax are changed into oral and tactile organs, forming foot jaws around the mouth; beneath a soft upper lip is a pair of strong mandibles moving laterally, the internal border hard, and having a tactile palpus; behind these mandibles are two pairs of lower jaws, weaker, and without tactile appendages; both mandibles and maxillæ are mere processes from the basal joint of thoracic legs; between these organs is a soft under lip, which is a fold of the skin. There is no distinction between head and thorax, the anterior part of the body being called cephalothorax, which contains 14 segments; the first six contain the eyes, antennæ, and jaws; the next three bear the maxillipeds or jaw feet; the 10th segment bears the great pincers, used as prehensile organs, ending in a two-fingered organ, the metatarsus being thickened and immovable and the tarsus capable of being applied to it like a finger; the four succeeding segments bear the ambulatory feet, consisting of six joints each, the anterior two pairs ending in weak pincers, and the posterior pairs with a single point, all more or less hairy. The abdomen consists of seven segments, with six pairs of natatory appendages beneath, some concerned in the function of reproduction, and the terminal one divided into five hair-fringed plates, the external ones jointed. According to Siebold, the thorax is entirely abortive, the five pairs of legs being appendages of the abdominal segments. The principal organ of locomotion is the tail, which, by a sudden bending underneath, sends the animal backward with great velocity. The carapace is free at the side, and has a transverse suture on the back, the last segment being immovable; the abdomen is about as long as or longer than the thorax. The intestine is straight, and the anus at the end of the tail; the stomach has a firm cartilaginous support in the pyloric portion, consisting of three solid movable pieces, called the "lady" from a fancied resemblance to a female figure seated upon a sofa; it is composed of chitine, studded with bristles, and its parts doubtless serve the purpose of teeth in an internal mastication; the cartilaginous framework is shed with the external skeleton. There is a greenish glandular organ surrounding the

intestine, with a mixture of fat cells; this, popularly called "tom alley," is the liver. There is a distinct heart, with well developed arterial vessels, but the blood does not flow through capillaries into veins, being effused into the lacunæ which lie between the organs and appendages of the body; still the blood moves in a determinate direction, assisted by venous sinuses. Respiration is aquatic, effected by branchiæ, 19 in number on each side, covered by the carapace, and enclosed in a special cavity at the base of the thoracic limbs, communicating externally by two fissures; the water enters at the base of the feet near the edge of the cephalothorax, and passes out on the sides of the respiratory organs, which consist of clusters of minute cylinders set together in a brush-like manner; the foot jaws have also branchiæ. The sexes are distinct. The eggs or berries of the lobster are reddish or blackish, spherical, glued together by a viscid matter, and attached in clusters to the hairy feet of the posterior abdominal segments; they are thus borne about, protected under the body of the female, until the embryos are fully developed. The young differ but little from the adults, and take shelter under the mother's tail; they are often seen surrounded by the young 6 in. long, which retire to safe retreats when apprised of danger by the mother. One of the most curious peculiarities of the lobster is the ease and frequency with which the large claws are separated, either by accident or from injury received in their constant attacks upon each other; these and the other limbs are very soon replaced, and it is very common to catch these animals with one claw absent or smaller than its fellow; they are said frequently to lose them after a heavy clap of thunder, at which they are always much disturbed. As the teeth of one large claw are numerous and sharp, and those of the other few and blunt tubercles, the uses are probably different, the one for crushing and the other for retaining food or crippling an enemy; they are very quarrelsome, whether free or in captivity, and are dangerous to handle for those unacquainted with their habits and mode of attack. They come in shore from deep water from March to May according to locality, and depart as irregularly in the autumn. They move rapidly in their migrations, in solid column, the largest and strongest in advance, the smaller and weaker bringing up the rear, and then scatter over their favorite feeding grounds, devouring clams, mussels, and other mollusks. They vary in length, as caught for the market, from 1 to 2 ft., though specimens are seen considerably larger than this, and in weight from 2 to 15 lbs.; they are common in the markets, especially in spring and summer, and are considered a great delicacy, though the meat is rather indigestible. There is only one species in our waters, found from the coast of New York northward; the best are taken on the rocky shores of New England north of Cape Cod;

our species is distinct from *H. gammarus* (Milne-Edwards) of Europe, and grows to a larger size. Their food is entirely animal. They are caught in baskets or traps, with a concave netting at each end having a hole in the centre, and baited with dead fish or any garbage; they can enter easily, but their expanded claws prevent egress, on the principle of the common wire rat trap. These traps, sunk to the bottom in deep water, and their places marked by wooden floats, are raised every day or two, and their contents removed; to prevent their injuring each other, a wooden plug is driven into the joint of the movable thumb, which keeps the claw shut, and they are then transferred to a large floating car, in which they will live many days, until they are wanted for market. The limit of salable size in Massachusetts is at all seasons 10½ inches. It would be impossible to estimate the number consumed annually in the fresh state, but it must be counted by hundreds of thousands; as the price varies from 3 to 6 cents a pound, at the lowest, it will be seen that the lobster fishery is a source of a very great revenue to New England, which is their principal habitat and market. The shortest way of killing them is breaking off the rostrum. They are considered as good only for bait while undergoing the change of the shell; no part is poisonous, though the cartilaginous stomach or "lady" is so tough that no one would think of eating it; like other crustaceans and shell fish, they sometimes cause eruptions of the skin in hot weather and in susceptible constitutions; the unimpregnated eggs, of a fine red color, commonly called "coral," are considered a delicacy. For further details on the habits of the lobster, see Prof. Verrill's "Report on the Invertebrate Animals of Vineyard Sound and adjacent Waters" (Washington, 1873).—The genus *palinurus* (Fabr.), or spiny lobster, of the European seas, grows to a weight of 15 or 20 lbs.; the shell is hard and spiny, the antennæ are much longer than the body, and the claws are very small; it is much esteemed as food, and was prized by the ancient Romans, who called it *locusta*.

**LOB-WORM**, a common species of the dorsibranchiate annelids, like the *errantes* of some authors, and the genus *arenicola*. The first name



Lob-worm.

is derived from the situation of the gills or branchiæ, arranged in tufts along the sides of the back; and the second from the fact that they lead a free life, being never confined in

tubes. They burrow in the sand and under stones, moving by means of lateral unjointed appendages, provided with bristles. The mouth is on the under side of the head, which has eyes and unjointed feeders. The sexes are separate. The *A. piscatorum* of the English coasts is used as bait. (See ANNELIDA.)

**LOCK**, a fastening for doors, boxes, &c., designed not to be opened except by an instrument called a key especially adapted to the lock, or by manipulating some secret arrangement of bolts and pins. The Egyptians used locks of a simple construction about 4,000 years ago, and more perfectly constructed locks have been used by the Chinese for centuries. The Chinese lock is furnished with parts which are called tumblers, and resemble

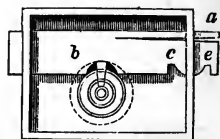


FIG. 1.

called spring locks, and their general construction is represented in fig. 1. The bolt *b* passes through a rectangular hole in each end of the lock, and is held either out or in by two notches *c e*, which are pressed against the edge of the hole by the spring *a*. The face of the key is seen to lie in a semicircular notch in the lower edge of the bolt, which is by that means moved backward and forward. A number of circular partitions, called wards, whose edges are seen surrounding the shaft of the key, prevent any key which has not corresponding open spaces



FIG. 2.

FIG. 3.

from being used. The ordinary key may have the form shown in fig. 2, but it is evident that it will answer the purpose of opening the lock as well if the parts are cut away, as in fig. 3; this is called a skeleton key, and is in common use among thieves in picking locks. The common tumbler lock, which has only been in use in Europe and this country during the last 100 years, is represented in its simplest form in fig.

4. The bolt *b b* is moved out and in by the key in the same manner as in the spring lock, but it is held from moving by processes or projections in a tumbler, *a*, which are thrown by a spring into notches in the upper edge of the bolt. This tumbler has to be raised by the key before the bolt can be moved. Baron's lock, patented in 1778, is so contrived that the processes in the bolt have to be

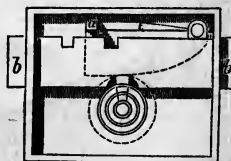


FIG. 4.

raised to a particular height in order that the bolt may be moved, because if raised higher they are thrown into opposite notches. The plan is represented in fig. 5. This lock was considered secure for several years, when the

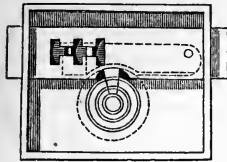


FIG. 5.

ingenuity of burglars discovered a method of picking it. Mr. Barron subsequently added another tumbler, which had to be raised to correspond to another set of notches in the bolt, and thereby greatly increased the security

of the lock. It is not certain that Barron applied more than two tumblers, but the principle of the many-tumbled lock is his. The form has been changed by putting a single pin called a stump in the bolt, which passes into slots in the tumblers, and these have to be raised to

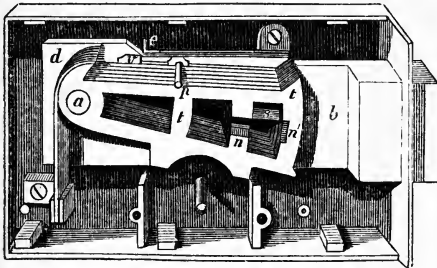


FIG. 6.

various heights in order to receive it. Chubb's lock has this form, as in fig. 6, where *b* is the bolt, *t* the tumblers (six in this cut), turning on the common pin *a*, *d* six springs to press down the six tumblers, and *n* the slots into which the stump *s* is drawn when the tumblers are raised to the proper height. The principle of Bramah's lock is similar, except that instead of tumblers turning upon a common pin, there are a number of independent slides having notches at different heights, but which are

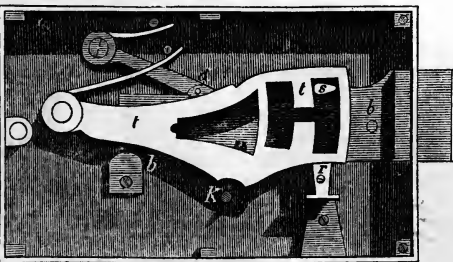


FIG. 7.

raised to a common height by a key having corresponding elevations on its face. It was supposed that a lock of the character of Bra-

mah's could not be picked; and during the world's fair at London in 1851 a challenge from the Messrs. Bramah, offering a reward of 200 guineas to any one who could pick a lock of theirs on exhibition, was accepted by Mr. Hobbs, an American. He succeeded after a trial of 51 hours, embraced in a period of 30 days. Hobbs invented a lock called a "protector," which is represented in fig. 7. This is much like Chubb's lock, except that the stump *s*, instead of being riveted to the bolt, is riveted into a detached piece shown in fig. 8, which

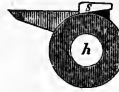


FIG. 8.

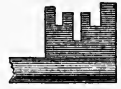


FIG. 9.

turns on a centre *h* when the stump *s* is pressed by the bolt. This action brings the attached arm against the case of the lock, by which means the tumblers are relieved from pressure by the stump, so that their positions cannot be ascertained by the burglar. The key, fig. 9, turns on the pin *k*, and the tumblers rest on the piece *r*. This lock, after defying the ingenuity of English locksmiths, was at last opened by Mr. Linus Yale, jr., of Philadelphia, who has since invented the celebrated Yale lock, which is now used all over the world. An improvement upon the form of the Hobbs and Chubb locks, in which the combination is not changeable, is the addition of a device by which the position of the slots and pins and the face of the key may be changed at pleasure. This was effected by Dr. Andrews of Perth Amboy,

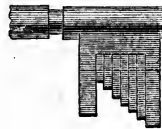


FIG. 10.

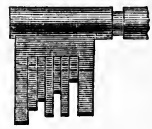


FIG. 11.

N. J., the principle of whose locks will be understood by inspecting the keys, figs. 10 and 11, where the face of the key is changed by varying the positions of the separate pieces held in it. The lock is too complicated to admit of a description within the limits of this article. It was long extensively used by banks and large stores, and its success caused numerous competitors to appear, prominent among whom was Mr. Newell, the inventor of Day and Newell's "parantoptic lock." The general plan of the Yale lock above mentioned is represented in section in the Yale night latch, figs. 12 and 13. An end view is shown in fig. 12, where a cylinder *c*, having a number of holes drilled along its whole length, as shown in fig. 13, may be turned when the key, *K*, raises the pins *a b c d e* so that their faces are even with the surface of the cylinder. These pins are of corre-

sponding different lengths in each lock, no two locks being alike. The flat key has bevelled-edged notches in one of its edges, corresponding to the lengths of the pins. The parts of

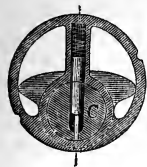


FIG. 12.

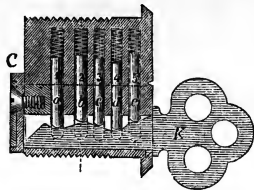


FIG. 13.

the lock shown here are called the "escutcheon," which not only comprises the cylinder, but the part above it, containing holes corresponding to those in the cylinder, and holding the same number of pins, 1, 2, 3, 4, 5, which, by means of spiral springs, are partly forced down into the holes in the cylinder when the key is withdrawn, thus fastening the lock. It will be seen that the faces of the two sets of pins must be in a line before the cylinder can be turned. Attached to the end of the cylinder, and not shown in the cut, there is a cam by means of which the bolt of the lock is moved. The unlocking of the cylinder is performed by simply thrusting the key into it, and of the bolt by turning the cylinder with the key.—A variety of locks which are usually placed upon fire- and burglar-proof safes, called permutation and combination dial locks, are now in extensive use, and a number of different patents embrace a variety of devices, which are however modifications of one general principle. This general principle will be understood if we suppose the tumblers in a Chubb or Hobbs lock, instead of turning on a hinge at one end, to be converted into wheels, and made to turn upon an axis, and, instead of having the slots brought to coincide by a key, adjusted by turning the wheels alternately one way and the other upon the axis on which they move independently. The wheels are placed near together, with washers between, and do

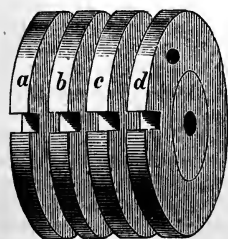


FIG. 14.

not interfere with the motion of each other except when certain pins, which may at pleasure be moved to various positions, collide with one another; then one wheel will move its neighbor, and carry it around to any desired distance. Again turning it in the opposite direction, but

through a smaller arc, another wheel may be turned until the slot in it is made to coincide with the first. A third and a fourth, and indeed any desired number of wheels (the num-

ber rarely exceeding four), may be adjusted with all their slots coinciding. The action is represented in fig. 14, where *a, b, c, d* are four wheels placed within the lock. Each wheel has a pin (shown only on *d*) which may be placed at pleasure upon any radius. A dial (fig. 15), turning by means of a knob upon an index plate, is placed upon the outside of the safe. A shaft passes through the door and through the axis of a wheel to

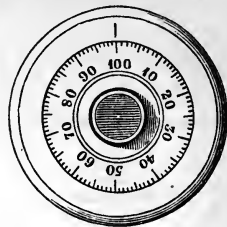


FIG. 15.

which it is fixed, and also through the axes of the wheels *a, b, c, d*, which however are free to turn. If now the fixed wheel has a pin upon its inner side which can be brought against the pin on the wheel *a*, it is evident that the slot may be made to correspond with any number upon the dial by adjusting the pin, and that by means of this dial the slot may be placed in any determined position. If now the dial is turned around four times, the wheel *d* must be moved before or at the end of the revolutions by means of the pins in the wheels successively colliding. Suppose the wheel *d* to have its pin so placed that when the number 20 stands opposite the index on the index plate its slot will be in the position given in the cut. Now, on turning the dial in the opposite direction, the wheels will be unlocked, but in the course of one revolution the fixed wheel will again lock with the wheel *a*, and this again in the course of the second revolution will lock with the wheel *b*, and this in the third revolution with the wheel *c*. If this latter wheel has its pin so adjusted as to be opposite the number 40 when its slot is brought to coincide with that of the wheel *d*, this will be indicated when the number 40 is opposite the index. Reversing the motion of the dial, the wheel *b* may have its slot brought to coincide with that of *c* and *d* during the second revolution. Again reversing the motion of the dial, the wheel *a*

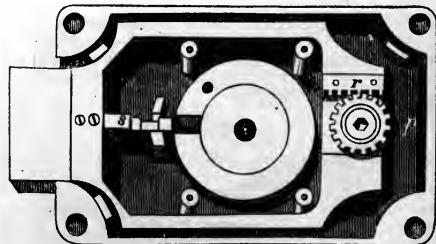


FIG. 16.

will have its slot brought to coincide with that of all the others. When the slots in all the wheels coincide the stump of the bolt may be thrown into the common slot, or a dog may

fall into it, leaving the bolt free to move, or any other arrangement can be made which may be thought advantageous. There are a number of excellent patents of combination locks in this country, some possessing advantages of one kind and some of another. In the simple form just described, represented in fig. 16, where the stump of the bolts passes directly into the slot, there is danger of a burglar detecting its position by feeling while pressing it against the periphery of the wheel, and thus discovering the combination. This is prevented by various devices. One of those used upon Hall's lock is shown in fig. 17. It consists in notching the fixed wheel, which

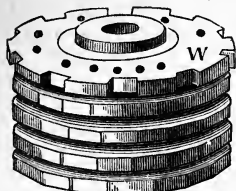


Fig. 17.

is somewhat larger than the others, so that the stump shall be pressed against it or into its slots instead of against the other wheels. The latter also are not circular, but polygonal, so that on turning them inequalities are felt which cannot be distinguished from slots. The device employed in the "Dexter lock," used on the Herring safe, is shown in figs. 18, 19, and 20. A false wheel, *a*, fig. 18, smaller than the others, has a slot which receives an extra bar, *c*, fig. 20, shorter and placed beneath the common bar for the other wheels; and also a shoulder, *s*, which prevents the "fence," *a*, fig. 20, from descending when the slot is not uppermost. Over this small wheel is a cam, *b*, fig. 19, which

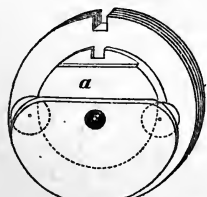


Fig. 19.

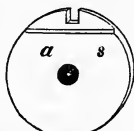


Fig. 18.

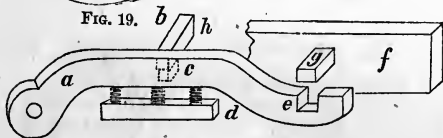


Fig. 20.

contains in each corner an octagonal roller, upon which the piece *d*, fig. 20, rests when the fence is raised. This piece *d* is constantly pressed by spiral springs, by which means all possibility of ascertaining when the bar *h* is brought opposite a slot in a wheel, or opposite any depression, is prevented. The locking in this arrangement is performed by raising the "fence" until the notch *e*, fig. 20, is brought to embrace the pin *g* attached to the bolt *f*. When the fence is depressed the bolt may

be moved backward or forward. In Sargent and Greenleaf's lock the bolt is composed of a roller, *b*, fig. 21, in which there is a slot, *c*, into which the sliding bolt, a part of which

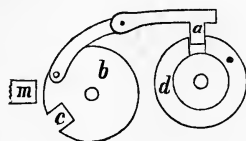


Fig. 21.

is represented at *m*, may be passed when the slot is brought opposite. This can be done when the bar *a* passes into the slots in the wheels, by turning the dial knob. The parts

are simplified in this drawing for convenience of illustration. Marvin's lock has a device shown in fig. 22. When the bar *b* falls into the common slot, turning the knob draws the piece *a* out of the chamber, when the bolt may be slid into it. In the lock itself the piece *a* is behind and partially hidden by the wheels, but the one shown in the cut is made smaller than natural for convenience of illustration.

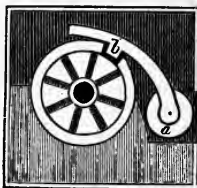


Fig. 22.

Sargent and Greenleaf have lately patented a clock-work attachment to one of their locks, by means of which the bolt is liberated from a catch at a set hour, before which time nobody, not even the person possessing a knowledge of the combination, can enter the safe through the agency of the lock.

**LOCKE, Matthew**, an English composer, born in Exeter about 1635, died in London in 1677. He was a pupil of Edward Gibbons, organist of Exeter cathedral, and was brought into prominence by composing the music for the ceremonies attending the restoration of Charles II., in whose court he obtained the post of composer in ordinary. Though he wrote both for the opera and the church, he is chiefly known at the present day from having composed the incidental music to "Macbeth" and the "Tempest" which is still given when those plays are performed. He wrote also several musical treatises, which were controversial in their character and of little value.

**LOCKE, David Ross**, an American satirist, born at Vestal, Broome co., N. Y., Sept. 20, 1833. He received a common school education, and learned the printer's trade in Cortland. After being connected with several western papers as a local reporter, he was successively editor and publisher in Ohio, from 1852 to 1860, of the Plymouth "Advertiser," Mansfield "Herald," Bucyrus "Journal," and Findlay "Jeffersonian." In the last named he published in 1860, under the signature of "Rev. Petroleum Vesuvius Nasby," a letter purporting to come from an ignorant and penniless Kentucky democrat, who was devoted to free whiskey and



the perpetuation of slavery, and who desired to be a postmaster. The development of this character, with various dramatic incidents, was the gist of the long series of "Nasby" letters, which were soon transferred to the "Toledo Blade," of which their author became a proprietor and editor. They were continued regularly for several years. Mr. Locke has lectured in all the northern states, generally on political topics. He has published the following works, consisting chiefly of the Nasby letters: "Divers Views, Opinions, and Prophecies of Yours Truly" (Cincinnati, 1865); "Swing Round the Circle" (Boston, 1867); "Ekkoes from Kentucky" (1868); and "The Morals of Abou ben Adhem, or Eastern Fruit in Western Dishes" (1874).

**LOCKE, John**, an English philosopher, born at Wrington, Somersetshire, Aug. 29, 1632, died at Oates, a country seat in Essex, Oct. 28, 1704. The moderate inheritance of his family was considerably reduced during the civil wars, in which his father was a parliamentary captain. Under the brief political ascendancy of the Puritans he imbibed the religious principle and spirit of liberty which actuated that body of men. His education began at Westminster school, from which he was elected in 1651 to Christchurch college, Oxford, where he graduated bachelor of arts in 1655 and master in 1658, continuing to reside in that city till 1664. In after life he regretted that he had spent so much of his time in the university, chiefly from his contempt of the scholastic philosophy and methods which were there upheld; yet he applied himself diligently to the classics, read in private the works of Bacon and Descartes, and enjoyed the friendship of persons whose society and conversation first suggested the idea of his greatest work. His companions were chosen rather from among the lively and agreeable than the studious and learned, and his early correspondence often displays wit and irony. The precise and scientific method of Descartes seems to have given the first impulse to his speculations, but Bacon exerted a more permanent and congenial influence, and he may be called the metaphysician of the Baconian philosophy. After receiving his degrees he devoted himself principally to medicine, which occupied much of his attention through life, and his eminent proficiency in which is attested by Dr. Sydenham, the greatest authority of his time. In 1664 he accepted the post of secretary in a diplomatic mission to the court of Brandenburg, and, returning to Oxford within a year, was in doubt whether to begin the practice of medicine as a profession, to continue in diplomatic employment, offers of which both in Spain and Germany were made to him, or to enter the church, a considerable preferment in which was promised through the duke of Ormond, lord lieutenant of Ireland. He was engaged in studies in experimental philosophy, when in 1666 he became acquainted with Lord

Ashley, afterward earl of Shaftesbury, who was then suffering from an abscess in the chest. Locke divined the nature of the disorder, which no one else had been able to discover; the life of the nobleman was believed to have been saved by a surgical operation which the philosopher advised; and the result was a close and permanent friendship between them. Locke accompanied him to London, and in his house enjoyed the society of the duke of Buckingham, the earl of Northumberland, Lord Halifax, and others of the most distinguished characters of the time. Ashley united engaging manners with distinguished ability, and was an admirable talker; and Locke, whose esteem for conversational capacity led him to assign it a first place in the formation of a man's mind, was probably attached in this instance very much by this quality. While residing with him he superintended the education of his son, and subsequently of his grandson the third earl of Shaftesbury, the elegant philosophical writer of Queen Anne's reign. In 1668 he accompanied the earl and countess of Northumberland on a tour in France, and after his return was employed by Ashley to draw up the fundamental laws of Carolina, which province had been granted to him and seven others. The scheme of government which was prepared, aristocratic and conformed to monarchy, yet tolerant of all religions, indicates the cautious and practical tendencies of his mind, since, though a lover of freedom, he proposed to establish it in a new country only in so far as it had been realized in England. In 1670 he made the first sketch of his "Essay concerning Human Understanding," which was finished in 1687 and published in 1690. In a discussion with five or six friends at his chambers in Oxford, he suggested that the dispute and perplexity could only be solved by a preliminary examination of our own abilities, and of what subjects our understandings are or are not fitted to deal with. He set down several thoughts on the subject previous to their next meeting, and the work thus begun was often resumed and often neglected during his various avocations, and was ultimately completed in retirement and leisure. While Shaftesbury was lord chancellor, Locke held the appointment of secretary for the presentation of benefices, and afterward of secretary to the board of trade. In 1675 he went to France for the benefit of his health, residing in Montpellier, where he became acquainted with Mr. Herbert, afterward earl of Pembroke, to whom his "Essay" is dedicated, and in Paris, where his conversation was welcomed by the most eminent literary and scientific men. He was recalled to England when Shaftesbury regained power for a brief season in 1679; and when that nobleman, charged with high treason, had taken refuge in Holland, he followed him thither in 1683. He continued to reside there after the death of Shaftesbury, having incurred the hostility of the court by his connection with

him. At Amsterdam he kept aloof from the British exiles who were plotting the rebellion of Monmouth, auguring their ill success, and joined with Limborch, Le Clerc, and others, in the formation of a philosophical society for the weekly discussion of important questions. Spies were set about him to suggest irritating topics, and to report his words to his ruin, but they were foiled by his steady silence concerning the politics of the day. The court therefore resolved to punish him in the only point where he was vulnerable, and ejected him from his studentship in Christchurch college. Still he refused to take part in the schemes of invasion, and concealed himself at Utrecht, where he was employed in writing his letter "On Toleration." In the *Bibliothèque universelle et historique* of Le Clerc he published in French in 1686 a "New Method of a Commonplace Book," in 1687 an abridgment of his "Essay on the Human Understanding," and in 1688 his letter "On Toleration," which was published in England in the same year, and in Latin at Gouda in 1689. Its liberal views were attacked by an Oxford theologian, and were defended by Locke in two additional letters. Adopting the theory of a compact, he maintained that the state relates only to civil interests, has nothing to do with matters in the world to come, and should therefore tolerate all modes of worship not immoral in their nature or involving doctrines inimical to good government. Conscious of no crime, he refused to accept a pardon which William Penn promised to obtain for him from James II., but returned to England after the revolution of 1688 in the same fleet which brought the princess of Orange, and obtained through Lord Mordaunt the office of commissioner of appeals. In 1690 appeared his "Essay concerning Human Understanding," the first work which attracted attention in England to metaphysical speculations, except on the part of merely studious men, and one of the greatest contributions in modern times to the philosophy of the human mind. The celebrity of the author as a friend of civil and religious liberty, the attacks upon it, and the attempts made at Oxford to prevent the students from reading it, were among the secondary causes of its success. Six editions appeared within 14 years, and through translations into Latin and French the fame of the author was made European. He published in 1690 two "Treatises on Civil Government," written to support the principles of the revolution by establishing the title of King William upon the consent of the people as the only title of lawful government; in 1693 his "Thoughts concerning Education," in which his object is to fashion a gentleman rather than a scholar, and therefore he lays less stress on learning than on virtue, breeding, and practical wisdom; and in 1695 "The Reasonableness of Christianity," the object of which was to determine what points of belief were common to all the Christian sects, in order to facilitate a

plan of the king for the reconciliation and union of them all. He published a vindication of this work against the charge of Socinianism, and conducted a controversy with Stillingfleet, who in his work on the Trinity denounced some of the principles of the "Essay" as opposed to fundamental Christian doctrines. In 1700 he resigned his commissionership in consequence of his failing health, and, declining a pension offered him by the king in a personal interview, retired to the mansion of his friend Sir Francis Masham at Oates, in Essex, where he devoted the remainder of his life to the study of the Scriptures. Among the fruits of his later labors were a "Discourse on the Miracles," "Paraphrases, with Notes, of the Epistles of St. Paul," and an "Examination of Father Malebranche's Opinion of Seeing all Things in God," which were published posthumously. His excellent treatise on the "Conduct of the Understanding," which may be regarded as the ethical application of his "Essay," being a scheme of the education which an adult person should give himself, also appeared after his death. He received during his last years, while suffering under an incurable asthma, the affectionate attentions of Lady Masham, a daughter of Ralph Cudworth, and died ultimately in his chair, from the natural decay of a constitution originally weak, while she was reading the Psalms to him.—The course and circumstances of Locke's life were in every respect favorable to the production of such a work as the "Essay concerning Human Understanding." Early imbued with a zeal for liberty and with the principles of a severe morality, his whole life was a warfare against the enemies of freedom in speculation, freedom in worship, and freedom from every unnecessary political restraint. Acquainted by his studies both with scholastic subtleties and the physical sciences, he was in mature age admitted to the society of wits and politicians, and became a man of business and of the world. The "Essay" was the product of meditation continued through many years, was composed at intervals, and is in a studied colloquial and rather racy style, which, however attractive to the reader, is too figurative, ambiguous, various, and even contradictory, for the purposes of philosophy. The essential character and tendency of his system has therefore always been a matter of dispute between metaphysicians of different schools, and different passages suggest very opposite conclusions. His object was to inquire into the origin, certainty, and extent of human knowledge, and his method was purely psychological, by the patient and tentative observation of the phenomena of consciousness. In the first book he confutes the Cartesian doctrine of innate principles or axioms, which would conflict with his whole theory of the empirical origin of our ideas. This theory is fully developed in the second book, in which he shows that our natural faculties are capable of forming every notion that we possess, that the ac-

tion of these faculties takes its rise from experience, and that the mind may therefore be compared to a sheet of white paper void of all characters till the events of time inscribe them. Having thus stated the principle that all the materials of our knowledge come from experience, he explains it more particularly by making a distinction between sensation and reflection as sources of ideas. The former is observation of the external world, the latter of our own mental operations. Though he uses the term reflection in a wavering and indefinite sense, it does not plainly appear that he ascribed to it any other power than that of a mere formal and logical mechanism, to act upon, to combine and compare, and to extensively modify the materials primarily afforded by the senses. In long and acute processes of reasoning he aims to bring the ideas of space, time, infinity, causality, personal identity, substance, and good and evil within the limits of experience. The third book is a treatise on the nature, use, and abuse of language. In the fourth book he passes from ideas to knowledge, from psychology to ontology, treating the question as to the adequacy of our ideas and the reality of our knowledge. He held a representative theory of perception, maintaining that the mind does not know things immediately, but by the intervention of ideas; that knowledge is real only in so far as there is conformity between our ideas and the reality of things; and that ideas may be entirely inadequate, however distinct they are, thus rejecting the criterion of Descartes. This theory contains the germ of utter skepticism, and was the ground on which Berkeley denied the existence of the material world, and Hume involved all human knowledge in doubt. The distinction established by Kant between the cause and the occasion of our conceptions, making the former to exist in the original constitution of the mind, and the latter in the circumstances of experience, would have removed the fundamental error involved, perhaps without design, in the system of Locke. There are indications in many passages of his work that he was not satisfied with that tendency to sensationalism, which when rigidly developed bore fruits of utilitarianism in morals, materialism in metaphysics, and skepticism in religion.—A biography of Locke was published in 1829 by Lord King, a lineal descendant of his sister, and added to Bohn's "Standard Library" in 1858. The best complete edition of his works is in 10 vols. (London, 1823). His philosophical works have been published by J. A. St. John (2d ed., 2 vols., London, 1854). A new biography by H. R. Fox Bourne was announced in 1874.

**LOCKED JAW.** See TETANUS.

**LOCKER, Frederick,** an English poet, born at Greenwich hospital in 1824. His father, Edward Hawe Locker, was a civil commissioner of Greenwich hospital, and author of several biographies of naval officers. Frederick be-

gan writing comparatively late in life, and for a long time was unappreciated by the conductors of newspapers and periodicals. Several of his poems, especially "A Nice Correspondent," "My Neighbor Rose," "Lines on a Human Skull," and "My Grandmother," have been very widely copied. These and other similar verses were gathered in a small volume entitled "London Lyrics" (1857), of which five editions have been published in London and one in America. Locker has also edited "Lyra Elegantiarum" (London, 1867), a collection of English *vers de société*, with an introductory essay on that kind of poetry.

**LOCKHART, John Gibson,** a Scottish author, born at Cambusnethan, Lanarkshire, in 1794, died at Abbotsford, Nov. 25, 1854. He was educated at the university of Glasgow, and having obtained an exhibition in Balliol college, Oxford, graduated there as a bachelor of civil law. After a tour on the continent he settled in Edinburgh, and in 1816 was called to the bar of that city. Although favorably known in the circles of the Scottish metropolis by his accomplishments, he failed to make an impression as an advocate, and upon the establishment of "Blackwood's Magazine" in 1817 became a contributor to its columns. In 1819 appeared "Peter's Letters to his Kinsfolk," the joint production of Prof. Wilson and himself, containing lively though exaggerated descriptions of Scottish society and manners. A considerable portion of "Christopher in the Tent," published in "Blackwood" in the same year, and several of the earlier "Noctes Ambrosianæ," were also written by him. In the previous year he had met Sir Walter Scott in Edinburgh, and the intimacy which sprung up between them resulted in Lockhart's marriage, in April, 1820, to Sophia Charlotte, the eldest daughter of Sir Walter. He soon after removed with his wife to Chiefswood, a cottage within two miles of Abbotsford, whither his father-in-law was in the habit of going daily for relaxation from his literary labors, or to escape his numerous visitors. He remained, however, a regular contributor to "Blackwood," and at the same time became an industrious writer of fiction. In 1821 appeared his "Valerius, a Roman Story," said to have been written in three weeks; in 1822, "Adam Blair," a Scottish tale of a deep and almost tragic interest; and in 1823, "Reginald Dalton," a tale of English university life. In 1822 he edited an edition of "Don Quixote," with copious notes, and in the succeeding year collected and published his translations of "Ancient Spanish Ballads," which had previously appeared in "Blackwood" and elsewhere. This work, which has been repeatedly reprinted in Great Britain and America, is one of his most popular publications. In 1824 appeared his last novel, "The History of Matthew Wald." In the latter part of 1825 Sir John T. Coleridge, who had conducted the "Quarterly Review" since the retirement of Gifford, resigned the

editorship, and Lockhart was invited to supply his place. He accepted the offer, removed to London with his family early in 1826, and edited the "Quarterly" till 1853, the work maintaining its reputation under his charge. He did not entirely relinquish his connection with "Blackwood," but contributed occasionally to the "Noctes Ambrosianæ" and to other departments of the magazine. His remaining works are: "Life of Robert Burns" (Edinburgh, 1828); "Life of Napoleon Bonaparte" (London, 1829); and "Life of Sir Walter Scott" (7 vols., London, 1836-'8). In relating Scott's business transactions, he allowed his prejudices to get the better of his judgment, and his strictures upon the Ballantynes, the publishers of the Waverley novels, provoked a bitter controversy. The emoluments which Lockhart received from his literary labors, and a sinecure given him by Sir Robert Peel, placed him pecuniarily in easy circumstances, but his latter years were clouded by domestic sorrows. His wife died in 1837; their eldest son, to whom Scott's "Tales of a Grandfather" were inscribed, had died some years before; and Lockhart survived his second son. His daughter, Charlotte (who died Oct. 26, 1858), was married in 1847 to James Robert Hope, who became owner of Abbotsford, and took the name of Hope-Scott. Of their three children, two died young, and in the surviving daughter, Mary Monica, the pedigrees of Scott and Lockhart became centred. Lockhart left the "Quarterly Review" in 1853 in shattered health, and retiring to Abbotsford, which had been inherited by his daughter, ended his life there. His personal qualities were not of a kind to make him generally popular. His manner was chilling and even supercilious to strangers; and he frequently uttered witty sarcasms.

**LOCK HAVEN**, a city and the capital of Clinton co., Pennsylvania, on the S. bank of the W. branch of the Susquehanna river, at the mouth of Bald Eagle creek, and on the West Branch canal and the Philadelphia and Erie and the Bald Eagle Valley division of the Pennsylvania railroad, 70 m. N. N. W. of Harrisburg; pop. in 1870, 6,986. It is a centre of the lumber trade, large quantities of logs being floated down the river to this point, and contains several saw mills, two national banks, graded public schools, including two high schools, and three weekly newspapers.

**LOCKPORT**, a city and the capital of Niagara co., New York, on the Erie canal and the New York Central railroad (which here crosses the canal by a bridge 500 ft. long and 60 ft. above the water), 20 m. E. of Niagara falls, and 25 m. N. N. E. of Buffalo; pop. in 1870, 12,426, of whom 3,489 were foreigners. It is situated in a rich agricultural district, and has large quarries of very fine limestone and of sandstone flagging, which give employment to several hundred men. The surplus water of the Erie canal, which is here raised 60 ft. by five double combined locks, is distributed by

means of a hydraulic canal three fourths of a mile long to various manufactories, furnishing an immense water power, and constituting one of the chief sources of prosperity. The city is lighted with gas, and contains 6 flour mills, 11 saw mills, a cotton and two woollen factories, the establishment of the Holly water works manufacturing company, three national banks with a capital of \$500,000, two state banks, graded public schools, including a high school, a Catholic female seminary, three daily and four weekly (one German) newspapers, and 14 churches. It was incorporated as a city in 1865.

**LOCKROY**, **Joseph Philippe**, a French dramatist, whose real name is SIMON, born of French parents in Turin, Feb. 17, 1803. He was one of the best actors of the Comédie Française, but left the stage in 1840 to write for it, in conjunction with Scribe, Anicet-Bourgeois, and other authors. Among his most successful plays are *Passé minuit*, *Les trois épiciers*, *Le chevalier du guet*, and *Charlot et le maître d'école*. With Alexandre Dumas the elder he wrote *Conscience*, a drama (1854). He also wrote the librettos for *La reine Topaze* (1856), *Ondine* (1863), and other operas.—His son **ÉDOUARD**, born in 1840, has become known as a radical politician and journalist. He was under arrest for a time in 1871 as a participant in the insurrection of the commune, although he had striven to prevent bloodshed; and in April, 1873, he was elected to the assembly by the department of Bouches-du-Rhône.

**LOCKYER**, **Joseph Norman**, an English astronomer, born in Rugby, May 17, 1836. He was educated in private schools and on the continent, and in 1857 received an appointment in the war office, into which in subsequent years he introduced many improvements. In 1866 he became a fellow of the royal astronomical society, and proposed a method of observing the red flames of the sun without the necessity of waiting for an eclipse, which was put in successful operation in 1868. In 1869 he was elected a fellow of the royal society, and during that and the following year he announced to it many important discoveries in solar physics. He was the chief of the eclipse expedition sent to Sicily by the English government in 1870, and in 1871 he was appointed Rede lecturer in the university of Cambridge. He is widely known as a lecturer on science, and his contributions to periodicals on scientific subjects are very numerous. In 1874 he succeeded Encke as corresponding member of the French academy of sciences. He is now (1874) editor of "Nature," a weekly scientific journal. He is the author of "Elementary Lessons in Astronomy" (new ed., revised by the author, New York, 1870), and of "Contributions to Solar Physics" (London, 1874).

**LOCLE**, a town of Switzerland, in the canton and 9 m. N. W. of the city of Neuchâtel, and 5 m. S. W. of La Chaux de Fonds, about 3,000 ft. above the sea; pop. in 1870, 10,334. The town is on the little river Bied, which a short

distance below disappears in a deep chasm. As the natural outlet of this was so small as to cause frequent inundations, a tunnel about 900 ft. long was cut through the solid limestone in 1802-'6, to carry off the surplus water into the Doubs. The town was burned in 1833. It now consists of scattered houses, generally painted and neat-looking, and contains a hospital for old men and an orphan asylum. Clocks, watches, jewelry, and lace are largely manufactured here, and constitute almost the sole industry. (See CHAUX DE FONDS.)

**LOCOMOTIVE ENGINE.** See STEAM CAR-  
riage.

**LOCRI**, or **Loeri Epizephyrii** ("Western Locri"), an ancient city of southern Italy, situated on the S. E. coast of the Bruttian peninsula. It was founded by a colony from Locris, Greece, in the 7th century B. C., and became celebrated by the laws of Zaleucus. In later times Locri was generally an ally of Syracuse, whose tyrant, the elder Dionysius, married a Locrian woman. When Pyrrhus of Epirus invaded Italy in 280, Locri was garrisoned by a Roman force. On his approach the Locrians drove out the Romans, and declared for the Epirote, but subsequently rose against the mercenaries whom he had stationed in their citadel during his absence in Sicily. Pyrrhus on his return levied heavy contributions upon them, and carried off a great part of the treasure deposited in the temple of Proserpine. After the departure of Pyrrhus from Italy Locri again submitted to Rome, but in 216, on receiving intelligence of Hannibal's great victory at Cannæ, went over to the Carthaginians. In 205 the treachery of the aristocracy enabled the Romans to recover possession of the city. From this period we hear little of Locri. It existed however as late as the 6th century A. D., and was probably destroyed by the Saracens. Modern travellers have discovered its ruins near the Neapolitan town of Gerace, where are the fragments of a Doric temple, supposed to have been that of Proserpine.

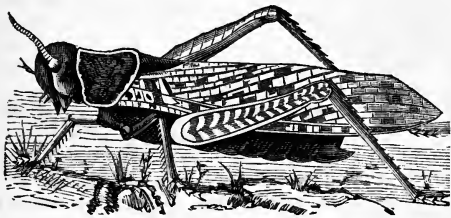
**LOCRI**, a territory of ancient Greece, occupied by the Locrians, who were said to have been descended from the Leleges. Their territory, in the opinion of Niebuhr, originally extended across the continent from the Corinthian gulf to the Eubœan strait; but the encroachments of the Phocians and Dorians gradually deprived them of the central portions, and confined them to the maritime districts. The Opuntii and Epicnemidii, whose territories lay toward the east, became comparatively civilized; but the western tribe remained in a semi-barbarous state. The territories of the Locri Epicnemidii (so called from their proximity to Mount Cnemis) and Locri Opuntii (named from their chief city Opus) stretched along the Eubœan strait and Malian gulf from the mouth of the river Cephissus to the pass of Thermopylæ, save where a strip of Phocis severed them. The Locrians are represented by Homer as following Ajax the son of Oi-

leus to the Trojan war with 40 ships. In the Persian war the Opuntii sent a contingent under Leonidas to Thermopylæ, and a squadron of seven ships to aid the confederate fleet. During the Peloponnesian war the eastern Locrians sided with Sparta.—The territory of the Ozolian or western Locrians was bounded N. E. by Doris, E. by Phocis, S. by the Corinthian gulf, and W. and N. W. by Ætolia. It is a mountainous and barren district. The surname of its inhabitants (Ozolæ, stinkards) was probably derived from the fetid sulphur springs which abound. The chief towns were Amphissa, Naupactus (now Lepanto), and Eupalium. The Ozolian Locrians first appear in history during the Peloponnesian war, and are classed by Thucydides with the half-savage Ætolians and Acarnanians, whom they resembled in many respects. In 426 B. C. they promised to aid the Athenian general Demosthenes against the Ætolians, but after his defeat they submitted to Eurylochus, the Spartan commander. In the latter days of Grecian independence they were members of the Ætolian confederacy. After the Roman conquest of Greece, all Locris was absorbed in the province of Achaia.

**LOCUST**, a saltatory orthopteron insect, of the family *locustidae*, and the genera *acridium*, *locusta*, *caloptenus*, and others. The locusts are characterized by roofed wing covers, short antennæ not tapering at the end, three-jointed feet, and absence of projecting ovipositor. The extremity of the body in the female is provided with four short wedge-shaped pieces, arranged in pairs, and moving up and down like double nippers; these are forced into the ground, enlarging the hole as they are opened and withdrawn until it is deep and large enough to receive the eggs. The males make a loud noise by rubbing their hind legs across the projecting veins of the wing covers, like playing upon a violin, the sound being intensified by a sonorous cavity in the first abdominal segment. The hind legs are very powerful, enabling them to leap much better than the grasshoppers; their strong and narrow wings give them the power of rapid and long continued flight, accompanied by a loud whizzing noise, compared in their immense swarms to the rushing of a whirlwind, the rattling of chariots, and the crackling of burning stubble. The Carolina locust, about 1½ in. long with an expanse of wings of about 3 in., is pale yellowish brown, with dusky spots, and black wings broadly margined with yellow; this species, well known for its sharp noise during the hottest days of summer, is found abundantly by the roadside, flying before the traveller to a considerable distance; it prefers warm and dry places, but is sometimes seen near salt marshes in company with the red-legged species; the eggs, deposited in the ground in autumn, are hatched in the following spring. In the genus *tetrix*, or grouse-locusts, Dr. Harris describes seven species; they are found in the hottest places, and leap to an astonishing



distance; they may be known by their small size, and their keeled thorax resembling a reversed boat.—The celebrated locust of the East (*Locusta migratoria*, Linn.; placed in the genus *acrydium* by Latreille) is about 2½ in. long, of a greenish color obscurely spotted, with pale brown wing covers marked with black. Its special habitat is western Asia, northern Africa, and southern Europe, whence it has spread even to England and northern Europe. It is destructive in all its forms, in the larval, nymph, and perfect conditions, feeding voraciously on plants. It will be sufficient here to allude to the devastations committed by locusts, as most books of eastern travel describe the steady and irresistible progress of their vast swarms, destroying every trace of vegetation in the districts visited by them. Their numbers are so incredible that rivers have been blocked and many square miles covered by them, the stench of their decaying bodies infecting the air for hundreds of miles. Messrs. Kirby and Spence mention an army of locusts which ravaged the Mahratta country, extending in a column 500 miles long, and so compact that it obscured the sun like an eclipse; this, however,



Eastern Locust (*Locusta migratoria*).

was another species, of a red color, which produced an additional bloody hue as they stripped the trees of their foliage. Many are the allusions in the Old Testament to the flight of these insects, and the prophet Joel (ch. ii.) gives a magnificent description of their appearance. The locusts were considered by the Hebrews and other eastern nations, and still are by the Arabs, as the avenging armies of the Deity; the latter assert that a statement to this effect exists in good Arabic on the wings of the insect; they do not occur in large swarms every year, but only every fourth or fifth season, and generally toward the end of May. Locusts are used as food in the countries where they abound; the legs and wings being pulled off, the bodies are fried in oil, and are considered a delicacy; they are sometimes dried in the sun, pounded up, and used as a flour for making bread. In many towns in Arabia there are shops where locusts are sold by measure. Other species are common in Africa, where they are also used as food. Gordon Cumming describes these insects in Africa as coming on like a snow storm, flying slowly and steadily about 100 yards from the ground; the air was darkened by their masses, and the

plain upon which he stood became densely covered with them; as far as the eye could reach in every direction, they stretched in one unbroken cloud, and more than an hour elapsed before their devastating legions swept by; they form in Africa food for man, cattle, carnivora, and birds. Locusts have also committed considerable ravages in America; most of the devastation popularly attributed to grasshoppers really belongs to locusts, and most often to the red-legged species (*C. femur-rubrum*, Burm.); they have proved specially destructive to the grass of salt meadows, clover, corn, and vegetables, until arrested by the early frosts; the hay crop is sometimes so much tainted by their decaying bodies that cattle refuse to eat it. Toward the middle of the 18th century these insects were so abundant in northern New England that days of fasting and prayer were appointed on account of the wide-spread calamity; and of late years they have been very destructive in the newly settled western states and territories. The *C. spretus*, popularly but erroneously called a "grasshopper," has this year (1874) committed terrible ravages in Minnesota and other western states, destroying about one tenth of the grain crop.—Various methods have been resorted to to check the ravages of locusts. A bounty has been given for their eggs; they are devoured by insectivorous mammals and birds, especially domestic fowls; the sand wasp preys upon them; intestinal worms (*gordius*) and red mites (*ocypete*) feed upon their juices and finally kill them; winds sweep them into the sea, and immense numbers are drowned by the high tides which inundate the marshes. The natural causes of destruction, after all, are more to be relied on than the occasional and isolated attempts of the farmer, who here rarely suffers in comparison with those of eastern nations.—The harvest fly and some species of grasshoppers are often erroneously called locusts in the United States. (See GRASSHOPPER, and HARVEST FLY.)

**LOCUST** (*Robinia*), a North American genus of trees and shrubs, of the order *leguminosæ*; they have stipular spines, flat seeds in many-seeded, compressed pods, preceded by showy white or rose-colored flowers, in simple, usually pendent, axillary racemes. The common locust tree (*R. pseudacacia*) grows in some districts to a great size, in the southwest reaching 70 or 80 ft. with a diameter of 4 ft.; it has a straight, lofty stem, covered with a thick, deeply and irregularly furrowed bark, and with strong, rude branches, ending in slender, virgate spray, which is clothed in summer with a soft velvety foliage, consisting of unequally pinnate leaves, often seen bright and clean by the dusty roadsides in the heat of the season, and then refreshingly beautiful; or earlier, with a profusion of fragrant, clustered, pendent blossoms. The locust tree loves the fertile soils westward of the Alleghany mountains, and extends thence as far as Ar-

kansas; but it is not indigenous north of Pennsylvania, nor to be found wild near the seacoast in the southern states. When growing upon thin soils, it is observed that it greatly improves them if unmolested, probably by the rapidity with which its small leaflets decay and form a natural compost or surface soil, bringing in a grassy sod. The locust plantations upon Long Island have been found to materially improve the soil, and at the same time afford a profitable crop of timber. The tree throws up numerous suckers, especially if the roots are wounded by the plough, and on this account it is objectionable in some situations; the suckers are sometimes used for making plantations, but the trees are never so shapely as those raised from seeds; it grows readily from seeds, which may be sown as soon as they are ripe in the fall; if kept until spring the seeds must be scalded to insure germination. The great enemy to the successful cultivation of the locust is the borer, the larva of *Clytus robinia*, a beautiful gold and black beetle which is found in great abundance on the goldenrods and other flowers in September, during their pairing season; the female then deposits her eggs upon the bark of the tree, and the young larvæ soon make their way to the interior, where from their great numbers they cause much damage; the larva perfects itself in one year. About 20 years ago this insect completely devastated the locusts in some of the western states. The only remedy that has been suggested is to plant in large groves, as the insect naturally seeks the trees upon the borders of a plantation. The free and unrestrained growth of the locust tree is very rapid, and its stem increases in magnitude to such a degree as to make valuable timber. It is not uncommon for young plants to attain a growth of 8 or 10 ft. in a single summer, and one sprout from a young stump of a yellow locust tree grew 16½ ft. The wood of the tree is yellowish, but the color varies, and lumbermen distinguish the white, yellow, and black locusts, as the wood is light or dark in color; whether these peculiarities are due to soil, or belong to distinct races or "strains," is not well ascertained; the darkest colored wood is considered the most durable. For certain uses in ship building the wood of the locust is preferable to any other timber. Where strength or durability in the material is required, its value is acknowledged. It makes excellent posts for fences and gates, sleepers for foundations, and ties for railroads; the writer has seen locust fence posts taken up that were known to have been in the ground for 60 years; they were so sound that they were set again; and mill cogs and similar articles in constant wear are constructed of it. A tree so beautiful, so rapid in increase, so valuable in economic uses, recommends itself for artificial cultivation upon acres of land otherwise almost valueless and to be found on every extensive farm. The locust tree was

carried to Europe in the time of Henry IV. of France, and was named *Robinia* in honor of Robin, father and son, who first introduced and cultivated it. The locust has produced some remarkable varieties from the seed, and European catalogues enumerate more than 20 named sorts in which there is some striking departure from the normal form; one of the finest of these is one named in honor of Prof. Decaisne (*R. pseudacacia*, var. *Decaisneana*), which has delicate pink flowers, and blooms almost all the season.—A southern species, known as the clammy locust (*R. viscosa*), occurs upon the mountains of Virginia and southward; it is from 20 to 40 ft. high, the petioles, peduncles, and young wood covered with a viscid pubescence. The flowers are white tinged with pink; the seed pod is glandular-pubescent, three- to four-seeded. This species is cultivated at the north for ornament. One other species (*R. hispida*), called rose acacia and also moss locust, is only a straggling shrub from 3 to 5 ft. high, but its flowers are



Moss Locust (*Robinia hispida*).

very large and of a deep rosy color. The branches, stalks, and pods are bristly. It is frequently cultivated, but as it has a disposition to throw up from its roots numerous suckers, it is much better to graft it into the common locust; and when thus set on a tall young stock of that species, the effect is exceedingly beautiful; it is also sometimes trained to a trellis. (See HONEY LOCUST.)

**LODÈVE**, a town of Languedoc, France, in the department of Hérault, at the foot of the Cévennes, on the Ergue, 28 m. W. N. W. of Montpellier; pop. in 1866, 10,571. The old cathedral church contains a fine mausoleum of white marble. There are important manufactories of army clothing and of woollen stuffs. It is the birthplace of Cardinal Fleury. In the middle ages Lodève was governed by viscounts, and afterward by sovereign bishops, who had the right of coining money till 1789.

**LODGE**, Thomas, an English author, born in Lincolnshire about 1556, died in London in September, 1625. He was educated at Oxford,

and became an actor and dramatist. In 1584 he was entered as a law student at Lincoln's Inn; he next accompanied as a soldier the expeditions of Clarke and Cavendish, and then applied himself to the study of medicine at Avignon. Having obtained his degree of M. D., he began to practise as a physician in London, and achieved great success owing to his intimate relations with the Roman Catholic party. He published a treatise on the plague, of which he is said to have died. The most important of his works are: "Rosalynde: Euphues Golden Legacie" (1590), a novel, chiefly interesting as the basis of Shakespeare's "As You Like It," and reprinted in Collier's "Shakespeare's Library" (1840); "The Wounds of Civil War lively set forth in the True Tragedies of Marius and Scilla," a drama (1594; reprinted in Dodsley's "Old Plays"); and "A Margarite of America" (1596), a tale, said to have been written during his voyage with Cavendish. He also wrote a "Defence of Stage Plays" (1580), and Translations of Josephus and Seneca (1602-'14). A collection of his pastoral and lyric poetry was published in 1819.

**LODI**, a town of Lombardy, Italy, in the province and 18 m. S. E. of the city of Milan, on the right bank of the Adda; pop. about 20,000. It stands on a gentle elevation in the midst of a fertile plain, and consists of the town proper, surrounded by walls with four gates, and eight suburbs. It is well built, and has a fine square lined with arcades. The cathedral has a Gothic façade, and contains a bass-relief which is a remarkable specimen of early Christian art, and several other fine works. Among the churches is that of the Incoronata, said by some to have been built by Bramante, in the form of an octagon, and an exquisite specimen of the renaissance style. Some of the paintings executed for it by Calisto da Lodi are so like those of Titian that they have been ascribed to him. There are several fine palaces, and other noteworthy buildings are the town hall, the theatre, and the hospitals. Lodi is the seat of a bishop, and contains a diocesan seminary, a lyceum, a gymnasium, and a number of other educational establishments, including a famous English female school. The principal manufactures are majolica and delft ware and chemical products; but the great staple is Parmesan cheese, which is almost exclusively made in the district of Lodi. The cows set apart for this cheese, many of which are brought from Switzerland, exceed 80,000, and sometimes it is said 70,000, and the annual production is more than 27,000,000 lbs.—Lodi was built in the 12th century, about 6 m. from Lodi Vecchio, which was of some importance under the Romans, and was called Laus Pompeia in honor of its founder, the father of Pompey the Great. The Milanese, who were in constant hostility to the inhabitants of Lodi, destroyed the old town in 1158, after which the new town sprung up around a fort built by Frederick Barbarossa in

1162. Lodi has acquired celebrity in modern times by the memorable passage of the bridge and the victory over the Austrians achieved here by Bonaparte May 10, 1796.

**LODOMERIA**, the Latin name of the principality of Vladimir in Volhynia in the middle ages. On the first division of Poland, in 1772, Austria gave the name of Galicia and Lodomeria to its share. (See GALICIA.)

**LODZ**, a town of Russian Poland, in the government of Piotrków, on a branch of the railway from Warsaw to Vienna, 75 m. S. W. of Warsaw; pop. in 1867, 34,328, nearly all Germans. The town 50 years ago had only a few hundred inhabitants, but is now next to Warsaw the most populous of the Russian kingdom of Poland. It owes its rapid growth to its manufactories of cloth and other woollen stuffs. It is called the Polish Manchester.

**LOFFODEN**, or **Lofoten**, a group of islands off the N. W. coast of Norway, between lat. 67° and 69° 30' N., and lon. 12° and 17° E., extending S. W. to N. E. about 175 m.; pop. about 17,000. The largest are Andö, Langö, E. and W. Vaagö, Flagstatö, and Hindö; and they constitute the bailiwicks of Loffoden and Vesterdaalen in the province of Nordland, excepting the S. E. part of Hindö, which forms part of Finmark. The coasts are exceedingly rugged and indented, and the interiors are mountainous and barren. The scenery is of the wildest and most magnificent kind; the islands, bays, and lakes are countless; the sharp-pointed peaks, 3,000 to 4,000 ft. above the sea, rise nearly perpendicularly out of the water, covered with moss almost to the water's edge till late in summer. As the snow melts numerous little waterfalls pour down the cliffs. The number of sea fowl is enormous, and the eider ducks are so numerous and so tame that the steamers have to relax their speed to avoid running over them. The famous Maelstrom is a narrow passage near the S. end of the group, between the islands of Moskenes and Vær. This whirlpool is produced by the current that rushes in and out of the Great West fiord, which lies between the Loffoden isles and the W. coast of Norway. Millions of cod are annually caught in the neighborhood of these islands from the middle of February to that of April. They are visited during the season by 3,000 to 4,000 open boats, manned by 15,000 to 20,000 men, the produce being more than 16,000,000 fish, 20,000 barrels of cod-liver oil, and 6,000 of cod roes. A considerable quantity is sold fresh, but the greater portion is dried and known as stock fish. The herring fishery is carried on during summer, and is very profitable. The most important islands for fisheries are E. and W. Waagö, where fish are more plentiful than in any other part of Europe.

**LOFTUS**, **William Kennett**, an English archaeologist, born at Rye about 1820, died on the passage from India to England in November, 1858. He was educated at Cambridge, where

he attracted the attention of Sir Henry de la Beche, who procured him an appointment on the Turco-Persian boundary commission, and from 1849 to 1852 he was a resident of Turkey in Asia, and explored the sites of the ancient cities on the Tigris and Euphrates. In 1853 he revisited the same ground under the auspices of the Assyrian society, and published in 1857 "Travels and Researches in Chaldæa and Susiana," &c., with engravings. Subsequently he received an appointment on the staff of the geological survey of India, the operations of which were interrupted by the mutiny of 1857-'8. The specimens of ancient sculpture which he sent to the British museum are hardly inferior in interest to those excavated by Layard, and he was the reputed discoverer of the city or cemetery of Warka, supposed to be the Biblical Erech.

**LOG, and Log Line**, an apparatus used in connection with the half-minute glass for obtaining the approximate rate of movement of a vessel through the water. The log is a triangular or quadrangular piece of board, one side of which has a circular edge, and is weighted with lead, so as to cause the piece to sit upright when thrown into the water. It is attached by cords from its corners to the log line, which is a stout cord about 150 fathoms long, divided by knots or slips of leather into spaces called knots, and wound on a reel which revolves with freedom. Its use is called "heaving the log," and consists in dropping the wood over the stern of the vessel, with a quantity of the line sufficient to reach from the vessel to the log, at the instant the half-minute glass is turned up. The reel is held up so that the line may run off freely as the vessel moves away from the log; and as the last sands run through the glass, the reel is instantly stopped. The number of knots run off in the half minute indicates the rate of motion of the vessel. This method of measurement is very inaccurate, a heavy sea sometimes throwing the log after the ship, while a head sea may carry it in the opposite direction. The glass also measures the half minute differently in damp and dry weather, and the line is liable to change its length. Various empirical allowances are made, which add but little to the correctness of the apparatus. It is not known when or by whom this contrivance was invented. Humboldt says that in all writings on the subject, including the "Encyclopædia Britannica," he found the erroneous opinion expressed that the log was not introduced before the end of the 16th or the beginning of the 17th century, while it is certain that Pigafetta, the companion of Magalhaens, early in the 16th century, speaks of the log (*la catena a popa*) as of a well known means of measuring the course passed over. Purchas makes mention of it in 1607; but the length of a degree of the meridian not being then determined, its divisions were necessarily inaccurate. They were corrected in 1635 by

Norwood. The length of a sea mile is now estimated at about 6,086 ft.; and as the length of the knot is intended to bear the same proportion to this that half a minute bears to an hour, the measurement of the knot is properly 51 ft. Each one is divided into 10 parts called fathoms. For glasses which run out in 28 seconds, the length of the knot should be 47.6 ft.—Numerous substitutes for the log have been contrived. The best of these is that of Massey. A box shaped like a wedge is provided with a spindle to which four wings are fixed spirally. With this are connected registering wheels somewhat on the plan of those of the gas meter, their object being to record the number of revolutions of the spindle. This is carried round by the motion against the water as the box is towed astern by a stout line 60 fathoms long. The box is hauled in, and the record noted whenever the course is changed; but while the ship runs full three knots the register is not reset except once every 24 hours. At a less rate its indications are uncertain from not towing horizontally.

**LOGAN**, the name of five counties in the United States. **I.** A S. W. county of West Virginia, bordering on Kentucky, and drained by the Guyandotte and the Tug fork of Sandy river; area, 750 sq. m.; pop. in 1870, 5,124, of whom 102 were colored. The surface is uneven and the soil generally good. Iron and coal are abundant in the highlands. The chief productions in 1870 were 135,273 bushels of Indian corn, 7,957 of Irish and 3,523 of sweet potatoes, 6,296 lbs. of wool, and 29,182 of butter. There were 589 horses, 1,376 milch cows, 2,539 other cattle, 4,505 sheep, and 3,381 swine. Capital, Arracoma. **II.** A S. W. county of Kentucky, bordering on Tennessee, and drained by branches of Green and Cumberland rivers; area, 478 sq. m.; pop. in 1870, 20,429, of whom 5,723 were colored. The surface, resting on cavernous limestone, is finely diversified and well timbered, and the soil fertile. It contains a number of ancient artificial mounds. The Louisville and Nashville railroad passes through it. The chief productions in 1870 were 255,049 bushels of wheat, 931,666 of Indian corn, 140,927 of oats, 18,036 of Irish and 23,937 of sweet potatoes, 2,707,571 lbs. of tobacco, 30,833 of wool, and 172,001 of butter. There were 4,807 horses, 2,618 mules and asses, 3,357 milch cows, 3,992 other cattle, 11,865 sheep, and 29,583 swine; 4 manufactories of agricultural implements, 11 of carriages, 2 of tin, copper, and sheet-iron ware, 3 of woollen goods, 3 tanneries, 3 currying establishments, 7 flour mills, 4 saw mills, and 3 wool-carding and cloth-dressing establishments. Capital, Russellville. **III.** A W. central county of Ohio, drained by the Miami river and its branches; area, 425 sq. m.; pop. in 1870, 23,028. The surface is moderately rolling or level, and the soil fertile. The Cleveland, Columbus, Cincinnati, and Indianapolis, and the Cincinnati,

Sandusky, and Cleveland railroads pass through it. The chief productions in 1870 were 544,126 bushels of wheat, 803,782 of Indian corn, 159,630 of oats, 56,333 of potatoes, 207,486 lbs. of wool, 34,671 of flax, 452,813 of butter, and 23,837 tons of hay. There were 7,439 horses, 5,586 milch cows, 10,280 other cattle, 54,479 sheep, and 20,753 swine; 11 manufactories of furniture, 21 of carriages, 9 of clothing, 10 of cooperage, 2 of machinery, 13 of saddlery and harness, 8 of tin, copper, and sheet-iron ware, 4 of woollen goods, 6 tanneries, 5 currying establishments, 12 flour mills, and 14 saw mills. Capital, Bellefontaine. **IV.** A central county of Illinois, intersected by Salt creek and drained by Kickapoo and Sugar creeks; area, 529 sq. m.; pop. in 1870, 23,053. The land is level and fertile. It is intersected by the Chicago and Alton railroad. The chief productions in 1870 were 239,019 bushels of wheat, 37,232 of rye, 4,221,640 of Indian corn, 490,226 of oats, 130,015 of potatoes, 30,448 lbs. of wool, 482,755 of butter, and 31,297 tons of hay. There were 12,204 horses, 1,615 mules and asses, 6,319 milch cows, 14,312 other cattle, 7,776 sheep, and 47,437 swine; 4 manufactories of brick, 19 of carriages, 13 of clothing, 2 of machinery, 14 of saddlery and harness, 1 of sash, doors, and blinds, 7 of tin, copper, and sheet-iron ware, 2 breweries, 10 flour mills, and 3 saw mills. Capital, Lincoln. **V.** A central county of Dakota, recently formed, and not included in the census of 1870; area, about 1,800 sq. m. It is mostly occupied by the "Plateau du Coteau du Missouri."

**LOGAN**, the assumed name of the Indian chief Tah-gah-jute, born about 1725, killed near Lake Erie in the summer of 1780. He was the son of Shikellamy, a chief of the Cayugas, who resided on the shores of the Susquehanna; and he was called Logan after James Logan, the secretary of Pennsylvania. In his early manhood he was known throughout the frontier of Virginia and Pennsylvania for his fine presence, his engaging qualities, and his friendship for the whites. About 1770 he removed to the banks of the Ohio, where he gave way in a measure to intemperance. In the spring of 1774 his family were massacred, it was alleged, by a party of whites led by Capt. Michael Cresap, under the pretext of retaliation for Indian murders; but it is exceedingly doubtful whether Cresap had any share in the transaction. Logan at once instigated a war against the scattered settlers of the far west, and for several months fearful barbarities were perpetrated upon men, women, and children. He himself took 30 scalps in the course of the war, which terminated after a severe defeat of the Indians at the mouth of the Great Kanawha. He disdained to appear among the chiefs who subsequently sued for peace, but sent to Lord Dunmore, the governor of Virginia, the following speech explaining his conduct, which was first published in Jefferson's "Notes on Virginia": "I appeal to any

white man to say if ever he entered Logan's cabin hungry, and he gave him not meat; if ever he came cold and naked, and he clothed him not. During the course of the last long and bloody war Logan remained idle in his cabin, an advocate for peace. Such was my love for the whites that my countrymen pointed as they passed, and said, Logan is the friend of the white men. I had even thought to have lived with you, but for the injuries of one man. Colonel Cresap, the last spring, in cold blood and unprovoked, murdered all the relations of Logan, not even sparing my women and children. There runs not a drop of my blood in the veins of any living creature. This called on me for revenge. I have sought it; I have killed many; I have fully glutted my vengeance. For my country I rejoice at the beams of peace. But do not harbor a thought that mine is the joy of fear; Logan never felt fear. He will not turn on his heel to save his life. Who is there to mourn for Logan? Not one." His habits of intemperance grew upon him after this, and while frenzied with liquor he felled his wife by a sudden blow. Thinking that he had killed her, he fled, and while traversing the wilderness between Detroit and Sandusky was overtaken by a party of Indians. Supposing his avengers at hand, he prepared to attack them, and was killed by his relative Tod-hah-dohs in self-defence.

**LOGAN. I. James**, an American author, born at Lurgan, Ireland, Oct. 20, 1674, died at Stenton, near Philadelphia, Oct. 31, 1751. He was a member of the society of Friends, acquired by his own efforts a good knowledge of science and languages, and was established in trade at Bristol when in 1699 he accepted William Penn's invitation to accompany him to America as secretary. In 1701, upon the return of Penn to England, he was appointed provincial secretary, and he was subsequently commissioner of property, chief justice, and president of the council, and acted as governor for two years after the demise of Gov. Gordon in 1736. His chief work, *Experimenta et Meletemata de Plantarum Generatione* (Leyden, 1739; London, translated from the Latin by Dr. Fothergill, 1747), an expansion of a paper on the growth of maize, was published in the "Philosophical Transactions" for 1735. He was the author of an English translation of Cicero's *De Senectute*, published in 1744 by Benjamin Franklin, which was the first original translation of a classical author printed in America. He gave his library, numbering about 2,000 volumes, to the city of Philadelphia, and it is deposited in a separate department of the Philadelphia library under the name of the Loganian library. **II. George**, an American statesman, grandson of the preceding, born at Stenton, Sept. 9, 1753, died there, April 9, 1821. He was educated in England, studied medicine and took the degree of M. D. in Edinburgh, and returned in 1779 to America, where he was one of the first to prosecute



farming in a scientific manner. He served several terms in the Pennsylvania legislature. At the outbreak of the French revolution he joined Jefferson and the republican party in opposition to the federalists. In 1798 he went to France to prevent war with the United States, and was well received; but having taken letters of introduction from Jefferson instead of passports from the state department, he was denounced by the federalists on his return as the treasonable envoy of a faction who had undertaken to institute a correspondence with a foreign and hostile power. He was coldly received by Washington and President Adams, and in the latter part of 1798 an act, known as the "Logan act," was passed by congress, making it a high misdemeanor for a private citizen to interfere in a controversy between the United States and a foreign country. He was a member of the United States senate from 1801 to 1807; and in 1810 he went to England in the hope of preserving peace.

**LOGAN, John**, a Scottish author, born near Edinburgh in 1748, died in London, Dec. 28, 1788. He completed his education at the university of Edinburgh, and was nominated a minister at Leith in 1773. In 1779 he delivered in Edinburgh a course of lectures on the philosophy of history, and in the following year was an unsuccessful candidate for the chair of history. His parishioners objecting to his writing for the stage, and charging him with intemperance, he was obliged to retire on a small pension, and devoted himself in London to literary pursuits. He edited in 1770 Michael Bruce's poems, but omitted some of that author's productions and inserted his own in their stead. His "Ode to the Cuckoo" (1770), and his hymns, which form part of the psalmody of the church of Scotland, attest a lyrical genius of a high order. A volume of his poems was published in 1781 (new ed., 1805, with the biography of the author). His other works include "Runnameda," a tragedy (1783); "Essay on the Manners of Asia" (1781-'7); "View of Ancient History" (2 vols., 1788); "Review of the principal Charges against Warren Hastings" (1788), which caused its publisher to be arraigned by the house of commons; and two volumes of sermons (1790-'91; 8th ed., 1822).

**LOGAN, Sir William Edmond**, a Canadian geologist, born in Montreal in 1798. His father belonged to a loyalist family who emigrated from Schenectady, N. Y., at the time of the war of independence. He was educated in the high school and university of Edinburgh, and engaged in commercial pursuits in London. In 1829 he became interested in copper-smelting and coal-mining operations in Swansea, South Wales, and during the seven years of his residence there devoted himself to the study of the coal field of that region with great success, adding much to our knowledge of the nature and mode of formation of coal deposits. He showed among other things that the stratum

of under-clay, as it is called, which always underlies coal beds, was the soil in which the plants yielding the coals grew, and thereby refuted the drift theory of the origin of coal. His minute and accurate maps and sections of this coal field were afterward adopted by the Ordnance Geological Survey and published by the government. In 1841 he visited the coal fields of Pennsylvania and Nova Scotia, where he made important studies and communicated several valuable memoirs, giving his results, to the geological society of London. At this time also he began the study of the older palæozoic rocks of Canada, and a geological survey of that country having been undertaken by the provincial government, he was placed at its head in 1842, a post which he held till his resignation in 1870. To him we owe a great part of our knowledge of the geology of the present provinces of Quebec and Ontario, from Gaspé to Lake Superior. His labors in the Laurentides first made known the importance in American geology of the ancient crystalline rocks, which have since received the name of the Laurentian and Norian series; and his studies of the Appalachian range in Canada are models of patient and laborious investigation, although his deductions with regard to the age and geological equivalence of some of the rocks are questioned. After the accession of the maritime provinces to the Dominion of Canada he made an elaborate study of the Pictou coal field of Nova Scotia. The results of his geological labors will be found in the reports of the geological survey of Canada, and in an elaborate map of north-eastern America prepared by him with the aid of Prof. James Hall. He has also communicated numerous papers to the geological society of London, and to the American "Journal of Science and Arts." He was the commissioner from Canada to the great exhibitions of London in 1851 and 1862, and to that of Paris in 1855; and at the last he received for his geological contributions the great gold medal and the decoration of chevalier of the legion of honor, in which order he was subsequently promoted to the rank of officer. He was knighted in 1856, and in the same year received from the London geological society the Wollaston palladium medal for his eminent services in geology. He has since received the Copley medal from the royal society of London, of which and of many other learned societies he has long been a member. Sir William Logan has for many years been a member of the corporation of the university of McGill college in Montreal, from which he holds the degree of doctor of laws, and in which he has lately endowed the chair of geology.

**LOGANSPOURT**, a city and the capital of Cass co., Indiana, on the Wabash, at its junction with Eel river, and on the Wabash and Erie canal, 70 m. N. by W. of Indianapolis; pop. in 1870, 8,950. The rivers are crossed by several bridges. The Pittsburgh, Cincinnati, and St. Louis, the

Toledo, Wabash, and Western, the Detroit, Eel River, and Illinois, and the Logansport, Crawfordsville, and Southwestern railroads meet here. The city is surrounded by a rich agricultural region, and has an important trade. Considerable quantities of poplar and black walnut lumber are shipped. Water power is abundant, and is used to some extent. The principal manufactories are the extensive car works of the Pittsburgh, Cincinnati, and St. Louis railroad, a hub and spoke factory, and large foundries. There are three banks, graded public schools, including a high school, and two daily and five weekly newspapers.

**LOGARITHMS** (Gr. λόγος, ratio, and ἀριθμός, number), numbers so related to the natural numbers that the multiplication and division of the latter may be performed by addition and subtraction, and the raising to powers and the extraction of roots by multiplication and division of the former. The labor of these operations by the ordinary processes of arithmetic, when the numbers are composed of many figures, is enormous. By the use of logarithms, for the invention of which the world is indebted to John Napier of Merchiston, Scotland, this labor is greatly diminished.

—The general theory of logarithms is very simple. All numbers whatever may be regarded as the powers of some other number taken as a base. Thus, taking as a base the number 8, its successive integral powers give the series of numbers 8, 64, 512, 4,096, &c.; for  $8^1=8$ ,  $8^2=64$ ,  $8^3=512$ ,  $8^4=4,096$ , &c. But it is not necessary to limit the series to the integral powers. The cube root of  $8=^3\sqrt{8}=8^{\frac{1}{3}}=2$ ; the square of the cube root of  $8=^3\sqrt{8^2}=8^{\frac{2}{3}}=4$ . The first power of 8 multiplied by the cube root  $=8 \times 8^{\frac{1}{3}}=8^{\frac{4}{3}}=16$ ;  $8 \times 8^{\frac{2}{3}}=8^{\frac{5}{3}}=8^{\frac{1}{3}}=32$ , &c. Other fractional powers would give the numbers omitted in this series; so that a power of 8 could be found which would be equal to any number whatever. By taking negative powers, fractions would come into the series. In a system of logarithms of which 8 is the base, the logarithms are the exponents of the powers to which 8 must be raised to produce the number. Thus, as above,  $\frac{1}{3}=\log.$  of 2,  $\frac{2}{3}=\log.$  4,  $1=\log.$  8,  $\frac{4}{3}=\log.$  16,  $\frac{5}{3}=\log.$  32,  $2=\log.$  64,  $\frac{7}{3}=\log.$  128, &c. It is obvious that the base of the system may be taken to be any positive number except unity. To demonstrate the general principles of logarithms, let  $a$  represent the base of the system,  $m$  any number, and  $x$  its logarithm; then the relation between the number  $m$  and its logarithm is expressed by the equation  $a^x=m$ . In this equation,  $x$  when considered in its relation to  $a$  is called the exponent or index of  $a$ ; when considered in its relation to  $m$ , it is called the logarithm of  $m$ . That is, the logarithm of a number is the exponent of the power to which the base must be raised to produce the number. Let  $m$  and  $n$  be two numbers,  $x$  and  $y$  their logarithms, and  $a$  the base; then  $a^x=m$ ;  $a^y=n$ . Multiply the first members of these equations

together, and we have  $a^x \times a^y = a^{x+y} = mn$ ; that is,  $x+y=\log. mn$ , or the logarithm of the product of two numbers equals the sum of the logarithms of the numbers themselves. Dividing the first of the equations above by the

second, we have  $\frac{a^x}{a^y} = \frac{m}{n}$ , or  $a^{x-y} = \frac{m}{n}$ ; that is,

$x-y = \log. \frac{m}{n}$ , or the logarithm of the quotient

of one quantity divided by another is equal to the logarithm of the dividend, less the logarithm of the divisor. In the equation  $a^{x+y}=mn$ , if we make  $m=n$ , then  $x=y$ , and we have  $a^{2x}=m^2$ ;  $2x$  is then the logarithm of  $m^2$ , or the logarithm of the square of a number equals twice the logarithm of the number itself. By similar reasoning it is shown that the logarithm of the cube of a number equals 3 times the logarithm of the number, &c. If we take  $m^2=p$ , then  $m=\sqrt{p}=p^{\frac{1}{2}}$ ; but  $\log. m^2=2 \log. m = \log. p$ . Substituting in the last equation  $\sqrt{p}$  for  $m$ , it becomes  $2 \log. \sqrt{p} = \log. p$ , or  $\log. \sqrt{p} = \frac{1}{2} \log. p$ ; *i. e.*, the logarithm of the square root of a number equals half the logarithm of the number itself. In the same way it may be shown that the logarithm of the cube root of a number equals  $\frac{1}{3}$  the logarithm of the number, and the logarithm of any root of a number equals the logarithm of the number divided by the exponent of the root.—The system of logarithms in common use is that proposed by Henry Briggs, professor of geometry at Oxford, soon after the publication of Napier's invention in 1614. Briggs used as the base of his system the number 10, and it was soon universally accepted, being so well adapted to the decimal notation. The logarithm of any number in this system is the exponent of the power to which the number 10 must be raised to produce the number. Thus, since  $(10)^0=1$ ,  $(10)^1=10$ ,  $(10)^2=100$ ,  $(10)^3=1,000$ ,  $(10)^4=10,000$ , &c., 0, 1, 2, 3, 4, &c., are the logarithms respectively of 1, 10, 100, 1,000, 10,000, &c. A number between 1 and 10 will have for its logarithm a fraction between 0 and 1. Thus the  $\log.$  of  $2=0.30103$ , for  $(10)^{0.30103}=2$ . A number between 10 and 100 will have for logarithm a number between 1 and 2; thus the logarithm of  $50=1.69897$ , for  $(10)^{1.69897}=50$ . Numbers between 100 and 1,000 will have for logarithms numbers greater than 2 and less than 3, or 2 plus a fraction; thus the  $\log.$   $250=2.39794$ , for  $(10)^{2.39794}=250$ , &c.—In order to make logarithms available for purposes of calculation, the logarithms of all numbers between convenient limits are computed and arranged in tables, the natural numbers occupying the leading or argument column, the logarithms being placed opposite in adjoining columns. Sometimes tables are arranged with the logarithms in the leading or argument column; these are called tables of anti-logarithms. For certain purposes logarithms constructed substantially according to the system originally proposed by Napier are

used, and are known as Napierian, natural, or hyperbolic logarithms. In this system the base is the number  $2.7182818+$ . These logarithms are of great use in the higher mathematics, and in the investigation of many problems in physics. The Napierian logarithm of a number is equal to the common or Briggs logarithm multiplied by  $2.3025851$ , or divided by  $0.4342945$ .—The early computers of logarithms carried them to ten places of decimals; but it was soon found that seven places were sufficient for most of the uses of astronomy, navigation, surveying, &c. In fact, five-place logarithms are often sufficient, and, being much more convenient and portable, should be used except when very great accuracy is required. The theory of logarithms is now taught as a part of liberal education, and is explained in all the treatises on algebra used in our high schools and colleges. Tables of logarithms are always preceded by directions how to use them. For this purpose no knowledge of the theory is required, an acquaintance with the rules of arithmetic being all that is necessary.—An excellent collection of five-place logarithms is that attached to "Bowditch's Navigator," and also published separately under the title of "Bowditch's Useful Tables." This contains, besides the tables of logarithms for numbers, log. sines, tangents, &c., also many auxiliary tables useful in navigation and surveying. A good collection of five-place tables by J. Hoüel (8vo, Paris, 1858) contains also Gauss logarithms, so called from the name of their inventor. They are numbers by means of which, when the logarithms of two numbers are known, the logarithm of their sum or difference can be found without knowing the numbers themselves. Thus, suppose we have the log. of  $a$  and the log. of  $b$ , but do not know what numbers correspond to these logarithms, and we wish to know the log. of  $(a+b)$ . With the ordinary tables we should first have to find in the table the number corresponding to log.  $a$ , then the number corresponding to log.  $b$ , then add the two numbers together and find from the table the log.  $(a+b)$ . This process requires three references to the table and one addition. By means of a table of Gauss logarithms the same result is reached by one reference to the table and two additions. Among tables of logarithms to seven places of decimals may be mentioned Babbage's, which are very accurate. Taylor's tables (large 4to, London) are very valuable, but difficult to obtain. Shortrede's tables (large 8vo, Edinburgh) contain nearly all the tables required in computing; they are especially designed for military and civil engineers. The tables of Callet (8vo, Paris) are very good; they contain the logarithms of all numbers from 1 to 108,000, with log. sines, tangents, &c., besides tables of Napierian logarithms to 20 places of decimals, and short tables of common logarithms to 20 and to 61 places. For log. sines, tangents, &c., Bagay's tables (4to, Paris) are very con-

venient; they contain log. sines and tangents for every second of the quadrant. Of the tables recently published the most valuable are those of L. Schrön, *Siebenstellige Logarithmen* (12th ed., Brunswick, 1873); Bruhns, "A New Manual of Logarithms to Seven Places of Decimals" (Leipsic, 1870), very beautifully printed; and G. von Vega, "Logarithmic Tables of Numbers and Trigonometrical Functions, revised and corrected by Bremiker" (55th ed., Berlin, 1873), which is very accurate and convenient. The logarithms are given to seven places of decimals.

**LOGIC** (Gr. *λόγος*, reason), the science of reasoning. More strictly and properly, it is the science of deducing ideas or conceptions one from another, and of constructing them into propositions, arguments, and systems. A wide range and great diversity of topics have, however, been included in the various treatises written under the name. Some have understood by it an account of the whole mental activity, and defined it as the art of thinking. Others have made it comprise only a knowledge of the first principles, or axioms, from which we reason. Others appear to have held it responsible for the truthfulness of all professedly logical reasonings and processes. Others again have regarded it as chiefly or exclusively an instrument of invention and discovery, and worthless except for the attainment of some new truth. It is now generally held that logic assumes certain first principles or axioms, from which as premises to reason; that it is concerned with the form only of reasoning or argument, and not at all with the subject matter; that it is and of necessity must be a purely *a priori* science, and moreover a hypothetical science, since it neither assumes nor proves as such the reality of anything, does not assert that any objects corresponding to our conceptions do really exist, but only gives results and conclusions based on premises, which are true provided the premises are true. Logic is thus limited to the method of reasoning. Though commonly regarded as consisting of two parts, analytics and method, it is essentially a constructive science; it explains the way in which theories and systems are constructed from our primary ideas of objects, and it proves and tests, not their truth, but their legitimacy as deductions. In this view it presupposes psychology, which is a sort of natural history of thought, and it is preliminary and prerequisite to ontology, the science of being.—Logic begins with ideas. Our ideas of objects are complex wholes, and may be analyzed into conceptions of the known properties of objects. Thus, snow is represented by its properties of whiteness, coldness, &c., and an orange by its color, shape, &c. These properties, or rather the terms describing them, become predicates which we may affirm of the object. Thus, having analyzed our idea of an orange, we obtain the properties of roundness, &c., and hence may say, "The or-

ange is round," &c. Or, forming a generic conception, we may say, "An orange is a fruit;" "Men are animals." We may thus predicate P of M, and M of S, and then, dropping the common or middle term M, may predicate P of S, a proposition derived by deduction from the two premises or primary judgments. The formula, "M is P, S is M, therefore S is P," is called a syllogism, a term which includes any possible combination of two propositions from which is deduced a third, which is hence called a conclusion. The conclusions of preceding syllogisms may become the premises of others *ad infinitum*. The premises may be negative as well as affirmative—S are not P, as well as S are P; they may also include only a part of the subject, as some S are P, some S are not P. Hence there are four cardinal propositions:

- Universal affirmative: All S are P.
- " negative: No S are P.
- Particular affirmative: Some S are P.
- " negative: Some S are not P.

For convenience these propositions are designated by the first four vowels; thus: A, universal affirmative; E, universal negative; I, particular affirmative; O, particular negative. Combining these four propositions in all possible ways of three in a set, we obtain 64 sets, which are called moods. Of these moods, however, only 11 are found to give valid conclusions, viz.: AAA, AAI, AEE, AEO, AII, AOO, EAE, EAO, EIO, IAI, and OAO. It is found also that the position of the middle term is of essential importance; for let the mood AAA be written thus: "All M are P; all S are M; therefore all S are P;" and it is evident at once that if M is included in the class P, and S is included in the class M, then S must be included in P also. But if the same mood be written, "All P are M; all S are M;" then it does not follow that S is included in P; for men are animals, and horses are animals, but men are not therefore horses. Every mood of the syllogism thus has what are termed figures, of which there are four. In the first figure, the middle term is the subject of the major premise and the predicate of the minor; in the second, the middle term is the predicate of both premises; in the third, it is the subject of both premises; and in the fourth, it is the predicate of the major premise and the subject of the minor. The 11 moods each having 4 figures would give 44 syllogisms, of which, however, only 19 are found by examination to be distinct and valid. These are designated by the capital vowels in the following mnemonic hexameters:

*BARBARA, CELAREnt, DARIL, fERIOque, prioris:*  
*CEsARE, cAmEstrEs, fEstIno, bArOlo, secundæ:*  
*Tertia dArAPL, dIsAmis, dAlis, fEAsIOm,*  
*BOkArO, fERIsOn, habet: quarta insuper addit.*  
*BrAmAnulp, cAmEnals, dimAris, fEAspO, frEsIsOn.*

When one of the premises is understood, but not expressed, in the statement, the syllogism is called an *enthymeme*. When several premises are employed for the same conclusion,

several syllogisms are in fact abridged into one formula, which is called a *sorites*. When one premise is assumed as hypothetically true, and the conclusion is stated as depending upon the truth of the other alone, we have what is called a conditional judgment; and if the conclusion is stated as depending upon the falsity of the other, we have a disjunctive judgment. A conditional or disjunctive proposition may be made the major premise, and then the syllogism be completed as follows: "If A is B, C is D; but A is B; therefore C is D." In this case the syllogism is called a conditional syllogism, or sometimes a hypothetical syllogism. "Either A is B or C is D; but A is not B; therefore C is D." In this case the syllogism is called disjunctive. The major premise may affirm only a comparison or relation between the terms, as: "Where the boy is, there the father is; but the boy is at home; therefore, the father is at home."—Besides the fulfilment of all the conditions of the formulas in syllogisms, there are found to be also certain conditions and laws in regard to the use of words, which are necessary to the validity of the reasoning. The violation of these laws gives rise to fallacies, of which there are reckoned 13, *6 in dictione* and *7 extra dictionem*. 1. Equivocation occurs when a word is used in the same formula in two different senses. 2. Amphibology when a word is so used as to leave it doubtful whether it be a subject or predicate, or when the reference of a pronoun is ambiguous. 3 and 4. Composition and division are caused by using the same term both collectively and distributively in the same formula, thus: "3 and 2 are two numbers; but 5 is 3 and 2; therefore, 5 is two numbers." Here 3 and 2 are used distributively in the major and collectively in the minor premise. The reverse is true of the word Romans in the following: "The Romans conquered Carthage; Brutus and Cæsar were Romans; therefore Brutus and Cæsar conquered Carthage." 5. Accent may occasion a fallacy by varying the meaning of a proposition. Thus the purport of the question, "Do you ride to town to-day?" may be changed five times by changing the accented word, or omitting the emphatic accent. 6. The form of the expression (*figura dictionis*) may lead to a fallacy, as when we infer from the fact that one word ending in *a*, as *mensa*, is of the feminine gender, that therefore another word with a like termination, as *poeta*, is feminine also. 7. The fallacy of accidents arises when we affirm of something described by some accidental property or circumstance what is true only of its substance, as: "We buy raw meat in the market; what we buy in the market, we eat; therefore, we eat raw meat." Here we do not buy meat because it is raw, but because it is meat, for its essence and not for its accidents, and only its essential quality is common to the different members of the argument. 8. Mistaken application consists in giving to a statement a universal appli-

cation when it was intended for only a limited one. 9. The *ignoratio elenchi* occurs when we either fail to give for any particular conclusion the premises required, or draw from given premises a conclusion not legitimately following from them, or employ a legitimate syllogism which does not give the conclusion that the occasion demanded. 10. The *a non causa, pro causa*, occurs when we reason from a premise that is true, but not a premise to the conclusion which we profess to draw from it. 11. The fallacy of consequences consists in employing a conclusion not derived from the premises. 12. The *petitio principii*, or begging the question, assumes as true that which should be proved. 13. The fallacy of many questions occurs when several interrogatories are either expressly or implicitly so combined into one that they must all receive the same answer, though truth requires that some be answered affirmatively and others negatively.—Aristotle was the creator of the science of logic (though he says that Zeno the Eleatic was the founder of dialectics), and his writings have been the basis of most of the treatises on logic that have since appeared. Six separate works constitute his *Organon*. In his "Categories" he treats of the highest generic ideas, which he reduces to ten, and of the nature of terms. In his "Prior Analytics" he examines the nature of propositions and the theory of conclusions; in his "Posterior Analytics," of demonstrable knowledge and the methods of reasoning. His "Topics" embrace dialectics and the discussion of first principles; his *Sophistica* are devoted to fallacies; and he also wrote a work on the art of expression. The whole system of Aristotle is crude and perplexed, as is usually the case with the first draft or statement of anything that lies far beyond the ordinary thought of men. There has, however, until a late period been little done in the department of logic more than to simplify and rearrange the materials furnished by the Stagirite. He recognized and discussed only the first three figures, and the discovery of the fourth is ascribed to Galen. Moreover, he scarcely regards the hypothetical syllogisms as modes of reasoning at all; the discovery of these is ascribed to Theophrastus. It was clearly seen by Aristotle that reasoning depends in some way on the relations of the logical wholes (individual, species, and genus) to one another. Porphyry in his "Introduction to Aristotle" explained more fully and clearly than his master had done the predicables, as they were called, namely, genus, species, differentia, property, and accident. Logic was extensively studied during the middle ages, though no important advance was made in its development. Its use gave rise to the scholastic method, which consists in applying the formulas of reasoning to terms, or to general principles deduced by definition or otherwise from terms. This method is of course legitimate, and the only one that is at all le-

gitimate, in mathematics, and in all *a priori* or demonstrative sciences. But in the natural sciences the first principles or topics are the facts of nature; and a careful observation, analysis, and classification of them, together with an induction from them, must precede any useful deduction. The discovery of this great principle led to a disregard of the proper sphere and use of formal logic, and brought the whole subject into neglect and contempt; and the inductive was generally proclaimed to be of vastly more use than the scholastic method. Induction, however, had not wholly escaped the attention of Aristotle, who defined it as "the method by which we pass from particular instances to general truths." The natural sciences all begin with induction. The philosophy of the method has not, however, been explained to universal satisfaction. The *Novum Organum* of Bacon was designed to show its necessity and practical application, rather than the philosophic grounds on which its validity rests. The works of Herschel, "Preliminary Discourse on the Study of Natural Philosophy," and Whewell, "History and Philosophy of the Inductive Sciences," have greatly improved the matter since Bacon's time. But the "System of Logic" by John Stuart Mill is regarded as the best exposition of the inductive method that has yet been produced. During the general neglect of logic, one of the most important works produced in its interest was *La logique, ou l'Art de penser* (1662), usually called the Port-Royal logic, by several authors, among whom Arnauld, Nicole, and Sacy were most prominent. It was really in the interest of the scholastic method, though intended otherwise, and though the scholastic rules and formulas were illustrated by new and well chosen examples, which constitute the great merit of the work. It was widely read, and gave a new impulse to the study. At the beginning of the next century Wolf published his great treatise on logic, in which he attempted to incorporate the peculiarities of the Leibnizian philosophy, and which gave the direction to speculations on this subject in Germany, leading the German writers to regard the fundamental laws of thought which underlie and give validity to logical formulas, rather than their practical value or application. In 1816 Hegel completed the publication of his "Logic," in which the term is used with a breadth of meaning peculiar to his philosophical system. The Hegelian logic is the law of absolute being, the scientific exposition of the pure conceptions of reason, of the absolute idea; its domain is the absolute truth as it is in itself, apart from its manifestations; it represents God as he is in his eternal being, before the creation of the world or of any finite mind; it is the analysis of the successive stages of history in their abstract form. It thus constitutes the first and highest part of the Hegelian scheme of absolute idealism, and since the time of Hegel the



German writings that have appeared under the name of logic have followed very much in the same direction, discussing questions which we are accustomed to regard as belonging to ontology under the title logic, rather than what we expect to find in books on this subject. Archbishop Whately published his "Elements of Logic" in 1826, when this branch of study was at its lowest ebb in the English universities. This work has had probably a wider circulation and more extensive use than any other ever written on the subject, and had the effect of recalling public attention to its importance. He maintained that induction as well as deduction should be regarded as a branch of logic, and consequently attempted to explain the philosophy of induction and to show its accordance with the deductive formulas; and while the writers of the German schools treated logic as chiefly or exclusively concerned with thought, Whately regarded it as chiefly concerned with words. His work gave rise to many other efforts in the same department, prominent among which was the "System of Logic, Ratiocinative and Inductive," by John Stuart Mill (1843), in which the author treats the grounds and fundamental principles rather than the formulas of reasoning. Being an eminent thinker of the sensational school, he does not make logic an *a priori* science, but aims to systematize the inductive method and reduce it to strict rules. The work abounds in valuable practical hints and reflections, and the concluding portion endeavors to solve the question whether from moral and social phenomena the instrument of logic may not derive a body of truths empirically acquired and universally assented to, like many of the laws of the physical world. In 1847 Prof. De Morgan published his treatise on "Formal Logic," an attempt to construct the science on a new basis. A mathematician of high repute, his work is difficult of comprehension to all except scholars in his own department. The peculiarity of its fundamental principle is that it ignores the distinction between a unit and an individual. Units, however, are not, and individuals are distinguishable from one another. Six men, for example, are not distinguished as mere units from any other six objects of thought; but it is obvious that we may predicate of six men what would not be true of six individuals in any other species of objects; and logic does not deal with its objects as mere units, but as individuals making up species and genera. If the subject in any affirmative proposition denote an individual, the predicate will denote the species in which it is comprehended; and if the subject denote a species, the predicate will denote the comprehending genus; but the argument neither establishes nor affirms any numerical relation between them. Sir William Hamilton dissented from the views of Whately and his followers, who considered logic as chiefly concerned with language and as including the de-

partment of dialectics. He maintained that it is exclusively occupied with the forms of reasoning, that it takes no notice of the subject matter, and has no connection with psychological processes. The peculiarity of his system results from what he calls the quantification of the predicate, a fact which in his view had hitherto been overlooked. Besides the four kinds of propositions designated by A, E, I, and O, he distinguishes four others. It had previously been held that all universal propositions as such and of necessity distributed the subject, and negative propositions the predicate. Thus in the universal affirmative, "All men are animals," the subject only is taken into the scope of the proposition as a logical whole. We here speak of "all men" as a class, but not of "all animals," and we say or imply nothing concerning the latter except that some of them are men. The universal negative distributes both terms, and in like manner it has been held that the particular affirmative takes neither of its terms as a whole, and that the particular negative distributes the predicate only. But Sir William Hamilton holds that we may have affirmative propositions with the subject distributed, and negatives with or without the predicate distributed; and he proposes to designate the eight propositions which result as A, U, I, Y, E,  $\eta$ , O,  $\omega$ . The scheme, presenting the quantity of the predicate, is as follows:

- U. Toto-total: All S is all P.
- A. Toto-partial: All S is some P.
- Y. Parti-total: Some S is all P.
- I. Parti-partial: Some S is some P.
- E. Toto-total: All S is not all P.
- $\eta$ . Toto-partial: All S is not some P.
- O. Parti-total: Some S is not all P.
- $\omega$ . Parti-partial: Some S is not some P.

This view, if it be accepted, revolutionizes the theory of the syllogism, and the whole system of logic as commenced by Aristotle and elaborated by his followers down to the time of Hamilton. De Morgan asserted that this theory of quantification was substantially the same as his own. George Boole, for many years mathematical professor in Queen's college, Cork, published "Mathematical Analysis of Logic" (1847), and "Investigation of the Laws of Thought, on which are founded the Mathematical Theories of Logic and Probabilities" (1854). An elementary treatise on logic by Dr. W. D. Wilson, then professor in Geneva college, N. Y. (since 1868 in Cornell university), was published in 1856. In 1872 he reissued his "Logic," in a form which is rather a new treatise than a new edition of the former work. In this latter he takes the ground distinctly that logic deals, not with ideas or conceptions at all, but with things, using words only as representing things under the various aspects in which they are contemplated by the mind. He holds that all the laws and formulas of reasoning are derived from one or another of the four relations of things, namely: 1, individual to species,

species to genus, &c.; 2, comparison of quantity, time, place, &c.; 3, cause and effect; 4, the relation of parts to their wholes, and *vice versa*. In his "Introduction to the Study of Metaphysics" Dr. Wilson has pointed out a new form of logic, applicable to the investigation and criticism of metaphysical facts and phenomena. In this he starts with the principle that language consists of nouns which denote things, and that all other words are used as subsidiary to the nouns in making sentences; thus, while the nouns denote the things we are speaking of, the other words indicate the relation which we suppose to exist between the things denoted by the nouns. Again, as language is but an expression of the facts and states of consciousness, we may use the words that constitute any sentence as a means of developing what was contained or even implied in the thought or mental state which gave rise to the sentence, and thus obtain a more rigorous and exact analysis of the phenomena of consciousness than we have been accustomed to. On the other hand, Dr. McCosh, president of Princeton college, has published a work, "The Laws of Discursive Thought" (New York, 1870), in which he holds that logic is based upon and deals chiefly with "the notion." His first part treats of "the notion," and occupies nearly half of the entire work. In this the author treats with great clearness and precision of the nature and relation of terms as the foundation of all reasoning. Thomson's "Outline of the Necessary Laws of Thought" is based on Sir William Hamilton's theory of what is called "the quantification of predicate." It has been extensively used, and is a very valuable treatise. Prof. Francis Bowen, of Harvard university, published in 1864 a "Treatise on Logic," in which the two systems, which may perhaps be best designated as the Aristotelian and the Hamiltonian, are both given with great clearness and impartiality, in such a way as to enable the learner to compare them easily and judge of their respective merits. Other important works produced in this country on the subject are: "The Elements of Logic," by Prof. Levi Hedge (1816), founded on the Scotch philosophy, and therefore omitting all metaphysical discussions of formulas and *a priori* conditions of thought; "The Elements of Logic," by Prof. Henry P. Tappan (1844), founded on the philosophy of Kant, and occupied rather with the conditions and laws of thought than with the application of logical formulas; "The Science of Logic," by Prof. A. Mahan (1857); and "System of Logic," by P. McGregor (New York, 1862). Prof. Bain, of the university of Aberdeen, published in 1870 (new ed., 1874) "Logic, Deductive and Inductive," a work which aims at embracing a full course of the science as it is usually taught, and also in the wider sense in which it is conceived and treated by Mill. The author also treats of the principles of psychology so far as he considers a knowledge of

them necessary to a right understanding of logic. A peculiar and useful feature of the book is its treatment of the great generalization of the 19th century, variously designated as the correlation, conservation, persistence, or indestructibility of force or energy. It also contains an account of the various modifications of the science and additions to it recommended by Hamilton, De Morgan, Boole, and others, and examples of its application to the other sciences. The work is valuable not only as a treatise on logic, but as explaining and illustrating the methods employed in modern scientific investigations. In 1872 Prof. Jevons, of Owens college, Manchester, England, published a small work, "Elementary Lessons in Logic," in which he gave a plain and fair statement of the theories of Hamilton, De Morgan, and Boole, although he regarded them as too recent to be generally adopted, and still preferred the old or Aristotelian system. Subsequently Prof. Jevons issued a larger and more comprehensive work, "The Principles of Science: a Treatise on Logic and Scientific Method" (London, 1874), in which he proposes a new system of representing the logical formulas. It is in a measure based upon the systems of Hamilton, De Morgan, and Boole, though different from them, supplying their deficiencies and correcting some errors which had been found to be involved in each of them. He assumes what is called the entire quantification of the terms, and treats the "some" which has been regarded as the sign of a particular or partial proposition, as in the statement "Some men are wise," as an adjective differentiating a class as completely as any other adjective, as "good men." Then, representing each noun and each adjective by a letter, supposing S to stand for "some," M for "men," and W for "wise," we should have  $S M = M W$ , "Some men are men wise;" or in the ordinary form of expression, where the recurring noun in the predicate is omitted by ellipsis, we have "Some men are wise." Or if we take the following syllogism in Barbara, "All metals are elements, and all elements are incapable of decomposition," and considering "incapable of decomposition" as a single word, "indecomposable," use the initials of each word for symbols, we have  $M = M E$ , and  $M E = I$ . Replacing the subject of the last proposition by M, which is shown by the first to be equivalent (logically) to the subject of the last, we have  $M = I$ , namely, "Metal is indecomposable," for our conclusion. The author then proceeds at great length to discuss the two methods of reasoning, deductive and inductive. He holds that deduction is first in order, and that even induction is but a method and form of deduction, inasmuch as induction always presupposes an assumed principle or hypothesis as its major premise, although he does not call it by that name. He dissents entirely from Bacon's view of induction, and agrees, as he affirms, with the method pur-

sued by Copernicus, Kepler, Galileo, Newton, &c., rather than that which was taught as a theory by Bacon. Prof. Jevons illustrates his system of notation and his theories of deduction by a wide range and most ample citation of examples. He discusses very elaborately the various methods of measurement and observation, with cautions against the errors to which the student is liable; and presents, on the whole, the most complete survey of the whole field of knowledge and inquiry that has yet been given to the public. In his psychology he is evidently a sensationalist, in that he does not believe either in any *a priori* element of knowledge or in any insight into the notion of things by which we can obtain necessary truths and axioms, which, while they may have been obtained on the occasion of an act of sense-perception, do nevertheless transcend the truths of sense-perception, and assert what can never be proved as absolute truths by any of the *a posteriori* processes, or by any processes that are based on sense-perception alone. Though thus a sensationalist in his psychology, Prof. Jevons is not, as one would naturally expect, a materialist in his ontology. He thinks that the modern doctrines of evolution, development, &c., as held by Spencer, Darwin, and those of their schools, are not only not proved, but cannot be proved on any premises within the sphere of knowledge, as distinguished from mere conjecture and hypothesis, by the use of any of the methods or modes of reasoning known to logic or admissible within the domain of science. And even as a hypothesis designed to explain observed and known phenomena, he thinks that the system of the modern materialists, when attempting to explain the phenomena of the universe without the recognition of a personal creator, introduces more mysteries or insoluble problems than it solves.—In Germany, from the time of Hegel, logic has followed mostly in the direction he gave it (already described), “as,” in the words of Ueberweg, “that part of philosophy which considers reason itself as the *prius* of nature and spirit.” Among the writers in this school may be mentioned, as most worthy of note, Kuno Fischer, *Logik und Metaphysik* (Heidelberg, 1852; 2d ed., 1865); Harnisch, *Handbuch der wissenschaftlichen Denklehre* (Lemberg, 1843; 2d ed., Prague, 1850); Rosenkranz, *Wissenschaft der logischen Idee* (1858–’9; together with *Epilegomena*, 1862); and Karl Werder, *Logik als Commentar und Ergänzung zu Hegel’s Wissenschaftslehre der Logik* (Berlin, 1841). But as early as 1832 Beneke published his *Lehrbuch der Logik als Kunstlehre*, which was a protest in some sense against the direction Hegel had given to speculations under the name of logic, and was based upon a more practical view of the nature of the science. As a follower of Beneke we have Dressler, *Die Grundlehren der Psychologie und Logik* (Leipsic, 1867; 2d ed., 1870). We have also as specially worth noticing, and not in

the Hegelian line, Trendelenburg’s *Elementa Logices Aristotelicæ* (Berlin, 1836; 6th ed., 1868; with supplementary *Erläuterungen*, 2d ed., 1861), and Ueberweg’s *System der Logik und Geschichte der logischen Lehren* (Bonn, 1857; 3d ed., 1868). In 1872 Robert Grassmann, a younger brother of the mathematician (see GRASSMANN), published *Die Begriffslehre oder Logik, zweites Buch der Formenlehre oder Mathematik*, in which he treats the whole science as a branch of mathematics. The system is analogous to that of Boole. The logical doctrines in regard to ideas, judgments, and inference are expressed in the form of definitions and equations between arbitrary symbols, and are treated like the theorems of algebra according to fixed rules of operation.

**LOGROÑO.** I. A province of Old Castile, Spain, bordering on Alava, Navarre, Saragossa, Soria, and Burgos; area, 1,945 sq. m.; pop. in 1870, 182,941. The northern part is generally level and very fertile, producing large crops of grain, fruits, and vegetables, and pasturing great numbers of sheep, goats, cattle, mules, and horses. Superior wine and oil are manufactured. The southern portion is crossed by the Sierra Neila, and consists mostly of barren hills; but it is rich in iron, copper, tin, antimony, marble, and coal. The province lies in the basin of the Ebro, which forms its northern boundary, and is traversed by several affluents of that river. It has limited manufactures of linen, woollen, and cotton goods, pottery, cutlery, shoes, and hats. The most important towns, besides the capital, are Calahorra and Arnedo. II. A city, capital of the province, on the Ebro, 153 m. N. N. E. of Madrid; pop. about 11,000. It is well built, with wide paved streets and fine squares, and is surrounded by a wall. It contains six churches, two hospitals, three convents, a Jesuit college, a prison, a theatre, and an orphan asylum, and is overlooked by the ruins of an ancient castle. There are manufactures of wine, oil, brandy, linen, woollen, and hempen fabrics, hats, leather, cards, and candles. The Ebro is here crossed by a magnificent bridge of 12 arches, built in 1138. The French captured the town in 1808, and again in 1823. It was the headquarters of Gen. Espartero during the closing period of the first Carlist war.

**LOGWOOD,** a dyewood yielded by the logwood tree (*hamatoxylon Campechianum*) of Central America. The tree belongs to the sub-order *Casalpinææ* of the natural order *leguminosæ*. It grows in very favorable situations 40 or 50 ft. high, but more commonly not more than 25 ft. Its trunk is generally less than 20 inches in diameter, and is crooked and covered with a rough bark. The branches are also crooked and furnished with thorns. The flowers, in axillary racemes, have a purplish calyx and light yellow petals. The outer sap wood is yellow, but the inner portion, which alone is exported, is deep red. It is a close-grained wood, very hard, and so heavy that it sinks in

water. Its decoction assumes various colors, according to the time it has been prepared and the substances with which it is treated. It is first deep red, but becomes paler by absorbing oxygen, and at the same time it acquires the property of precipitating gelatine. Acids brighten the color, while they also make it paler; alkalis render it of a purplish or violet hue, and the salts of iron dark violet blue. The wood is principally useful for furnishing red and blue, but more particularly black dyes. By the use of iron and alum bases they are obtained of various degrees of intensity, and with proper mordants are rendered permanent. The coloring principle of logwood was separated about the year 1811 by Chevreul, and this is now known by the name of hæmatoxyline. He obtained it from the watery extract in transparent brownish yellow crystals, the composition of which when anhydrous is represented by the formula  $C_{10}H_{11}O_{15}$ . Erdmann



Logwood.

also procured 4 oz. of the crystals from 2 lbs. of the pulverized extract by digesting it in 2 lbs. of ether, with a portion of sand intermixed to prevent agglutination, and afterward expelling the ether by evaporation. Hæmatoxyline resembles liquorice root in taste, is soluble in boiling water, and with alcohol and ether produces reddish yellow solutions. Besides this substance, the wood contains a great variety of salts of lime, alumina, iron, and manganese, together with a fatty or resinous substance, a volatile oil, tannin, acetic acid, &c. Logwood is used in medicine as well as in dyeing, being a mild astringent without irritating properties. It is given in extract or decoction in cases of chronic diarrhoea, chronic dysentery, and in the relaxed state of the bowels succeeding cholera infantum. It imparts its color to the alvine evacuations. A weak solution of the extract is very useful in staining anatomical preparations.—To prepare the wood for use,

the imported logs were formerly cut by machinery into chips by means of steel cutters upon a horizontal drum, against which they were moved endwise; but the practice is now to grind the wood to powder, in which state the infusion is more readily obtained than from the chips.—Logwood was taken to Europe for a dyeing material soon after the discovery of America. Its introduction into England was violently opposed in the time of Queen Elizabeth, and an act was passed prohibiting its use. This was repealed in 1661, when the demand for logwood rapidly increased. It was obtained only in the Spanish possessions; and in order to procure it the New Englanders made settlements in Yucatan, and sent thence large quantities to the north and to Jamaica. The opposition of the Spaniards led at last to a special treaty between England and Spain, by which British subjects were permitted to cut and ship the wood in the bay of Campeachy; whence the name it has received of Campeachy wood. In 1715 the tree was introduced into Jamaica; by means of planting the seed and from being cultivated in plantations it spread all over the island. Thus Jamaica also has furnished large quantities to commerce.

**LÖHER, Franz von**, a German author, born in Paderborn, Oct. 15, 1818. In 1846-'7 he visited Canada and the United States, and in 1849 established the *Westfälische Zeitung* at Paderborn. In 1855 he became professor in the university of Munich. His works include *Des deutschen Volkes Bedeutung in der Weltgeschichte* (Cincinnati, 1847); *Geschichte und Zustände der Deutschen in Amerika* (2d ed., Göttingen, 1854); the epic poem, *General Spork* (2d ed., Göttingen, 1856); *Land und Leute der alten und neuen Welt* (3 vols., 2d ed., 1860); *Jakobäa von Bayern* (2 vols., Nördlingen, 1861-'9); and *Aus Natur und Geschichte vom Elsass-Lothringen* (Leipzig, 1871).

**LOIR** (anc. *Lidericus*), a river of France, which rises near the centre of the department of Eure-et-Loir, in a range of hills dividing its basin from that of the Seine, and joins the Sarthe a little above the junction of the latter with the Mayenne, 7 m. N. of Angers. Its length is 150 m., and it is navigable for 80 m. Its principal tributaries are the Ozane, Braye, Conie, Long, and Meaulne.

**LOIRE** (anc. *Liger*), a river of France, running N., N. W., and finally W. by S., across the central and western parts of the country, and dividing it into two nearly equal parts. It rises on the slope of the Cévennes, in the department of Ardèche, and passing by the towns of Le Puy, Nevers, Orleans, Blois, Amboise, Tours, Saumur, and Nantes, flows into the Atlantic near St. Nazaire. Its principal affluents are the Arroux, Nièvre, Allier, Cher, Indre, Vienne, Mayenne, and Sèvre-Nantaise. Below Nantes, where it first feels the influence of the tide, it is studded with small islands. Its length is upward of 600 m.; it is navigable from its mouth to Roanne, a

distance of 450 m.; and between this point and Noirie, 45 m. higher, it is navigable downward only. In the lower part of its course it is obstructed by shifting sands, but these impediments are obviated by a canal known as the *canal latéral à la Loire*, completed in 1838. The river is also subject to floods, to guard against which extensive works have been constructed. The inundations in 1846 and 1856 were especially formidable. In its upper course the river is a romantic mountain torrent; as it descends, its valley widens and embraces extensive plains, so richly covered with orchards, vineyards, and corn fields, that they have justly received the name of the "garden of France." The basin of the Loire is estimated at one fourth part of all France.

**LOIRE**, a S. E. department of France, consisting of the old province of Forez and portions of Beaujolais and Lyonnais, bordering on the departments of Saône-et-Loire, Rhône, Isère, Ardèche, Haute-Loire, Puy-de-Dôme, and Allier; area, 1,838 sq. m.; pop. in 1872, 550,611. The surface consists chiefly of extensive plains broken by the mountains of the Cévennes and Forez, and by several isolated volcanic hills of black basalt. The Loire flows centrally N. through its whole extent, and the Rhône flows for a short distance on the S. E. border. The heights separating the valleys of the Loire and the Allier are chiefly composed of granite rocks or of the older limestones and sandstones. This department contains one of the richest coal fields of France. Lead, iron, building stone, granite, and potter's clay are the other most important minerals. The soil is not of superior quality, but produces hemp, fruit, wine, oil seeds, grain, madder, and excellent pasturage, on which feed great numbers of cattle and sheep. In the valley of the Rhône mulberry trees are extensively grown for the production of silk. Pine, fir, oak, and beech grow on the mountains, and large quantities of pine are converted into charcoal. Chestnuts form a staple in the common diet of the people, and are largely exported to Paris. The manufactures are important, and include firearms, cutlery, ironware, machinery, cotton, woollen, silk, and linen goods, glass, bricks, canvas, earthenware, lime, &c. It is divided into the arrondissements of Montbrison, Roanne, and St. Étienne. St. Étienne, the chief manufacturing town, became the capital in 1855 in place of Montbrison.

**LOIRE, Haute.** See HAUTE-LOIRE.

**LOIR-ET-CHER**, a central department of France, including a large part of the old province of Orléanais and a small portion of Touraine, bordering on the departments of Eure-et-Loire, Loiret, Cher, Indre, Indre-et-Loire, and Sarthe; area, 2,452 sq. m.; pop. in 1872, 268,801. The surface presents a number of elevated and extensive plains, and is nearly equally divided by the Loire, the district N. of which is traversed by the Loir and its affluent the Braye, and that S. by the Cher,

Sauldre, Beuvron, and Cosson. The S. E. of the department presents a vast marshy plain which contains many hundreds of ponds. The soil is of various qualities: in the N. E. it is a dark rich loam, in the S. E. clay and sand, along the Cher calcareous, and the N. W. part is arid and covered with heath. The chalk formation occupies a large portion of the department. The chief crops are grain, wine, fruits, vegetables, beet root, and hemp. Vendôme is noted for its draught horses, and the Sologne district for its sheep. The climate is in general mild and salubrious excepting in the marshy S. region, where malaria prevails, and where the population is in a wretched condition. The manufactures consist of coarse woollens, cotton cloth, hosiery, gloves, sugar, leather, glass, and earthenware. It is divided into the arrondissements of Blois, Romorantin, and Vendôme. Capital, Blois.

**LOIRE-INFÉRIEURE** (Lower Loire), a W. department of France, in Brittany, bordering on the bay of Biscay and the departments of Morbihan, Ille-et-Vilaine, Maine-et-Loire, and Vendée; area, 2,654 sq. m.; pop. in 1872, 602,206. The coast line is about 60 m. long, and broken by a number of bays. The interior is level, with the exception of a line of low hills in the north. The department is watered by the Loire and its tributaries the Sèvre-Nantaise, Acheneau, and Erdre. The Vilaine touches the department on the N. W. border, and there are several less considerable streams. Grand-Lieu, formerly the largest lake in France, situated near the left bank of the Loire, with which it communicated by the Acheneau, has been recently drained. The principal minerals are coal, iron, lead, tin, slate, granite, quartz, mica, kaolin, and feldspar. The soil is generally fertile. The chief products are wheat, rye, buckwheat, mixed grain, barley, and wine. The pastures are excellent, and cattle of good breed and horses are numerous. The principal manufactures are linen, cotton, and woollen goods. Ship building is extensively carried on at Nantes, Paimbœuf, and Pellerin. On the coast there are large fisheries. The commerce with North and South America, Africa, and the East and West Indies is important. It is divided into the arrondissements of Ancenis, Châteaubriant, Nantes, Paimbœuf, and Savenay. Capital, Nantes.

**LOIRET**, a central department of France, consisting of a part of the old province of Orléanais and a small portion of Berry, bordering upon Seine-et-Oise, Seine-et-Marne, Yonne, Nièvre, Cher, Loir-et-Cher, and Eure-et-Loire; area, 2,614 sq. m.; pop. in 1872, 353,021. The surface is level or gently undulating, and is traversed by the Loire, Loiret, Loing, and a number of smaller streams. Water communication is much extended by the canals of Briare, Orleans, and Loire. There are several extensive forests in the eastern and central parts of the department. The soil is generally fertile, especially N. of the Loire. The chief products



are grain, wood, wine, and saffron. Mineral springs abound. It is divided into the arrondissements of Orleans, Gien, Montargis, and Pithiviers. Capital, Orleans.

**LOISON, Pierre**, a French sculptor, born at Mer, Loir-et-Cher, in 1821. He studied under David d'Angers, and exhibited his first works in 1845. In 1853 he exhibited his statues of "Hero" and "Spring," and in 1855 a "Nymph" which was purchased by government, as was subsequently his "Pandora." Among his other works are statues of "Penelope," "Sappho," and a "Maid of Honor of the Court of Francis I.," the last exhibited in 1869. He has also executed various works for the new Louvre, the Tuileries, and for churches.

**LOJA**, an inland city of Ecuador, capital of a province of the same name, 250 m. S. by W. of Quito; pop. about 10,000. It is situated in a delightful valley nearly 7,000 ft. above the sea, near the southern frontier of the republic. The streets are very regular, and the houses, though of adobes, present a neat and cheerful appearance. The public buildings comprise a church, three convents, a hospital, a college for Latin, philosophy, and Spanish, and a number of other schools. In the vicinity of Loja are found gold, quicksilver in a state of comparative purity, coal, and a species of beautifully veined marble; but the chief product of the region is cinchona, of which Loja is the original home, and which is extensively exported.

**LOJA**, a town of Spain, in the province and 25 m. S. W. of the city of Granada, in a valley between two mountain ranges, on the shores of the Genil; pop. about 16,000. It contains five squares of respectable appearance, but most of the streets are irregular and steep. There are about 20 woollen factories, and various other industrial establishments. The prosperity of the town has been much increased by the completion of the railway to Granada. Various relics found here evince that Loja was of some importance under the Romans. The Moorish castle, ruins of which still exist, was taken by Ferdinand III. in 1226. As the key to Granada the town possesses great strategical importance. In 1486 Ferdinand and Isabella besieged and captured it after about a month's investment, during which the English archers under Lord Rivers greatly distinguished themselves.

**LOKEREN**, a manufacturing town of Belgium, in the province of East Flanders, on the Durme, 12 m. N. E. of Ghent; pop. in 1866, 16,912. The most important among its numerous manufactures are linen fabrics, flannels, serges, lace, cloths, hats, and cotton goods. A brisk trade is carried on in manufactured goods, hemp, cattle, and agricultural produce.

**LOKMAN**, an Arabian fabulist, represented in the Koran as a contemporary of David, and by other traditions as a descendant of the Arab tribe of Ad; and again as an Ethiopian slave, deformed and witty, like Æsop, with whom he has been identified. The earliest traditions of

the Arabs, and all subsequent accounts of him, however conflicting in other respects, agree in ascribing to him extraordinary wisdom and longevity. A small collection of Arabic fables which bears his name is supposed to be of Greek origin, and to have become known to the Arabs through a Syriac version. They were first published at Leyden in 1615, with a Latin translation of the Arabic by Erpenius. They have since been translated into French, Dutch, and German, and despite their mediocrity in respect to wit and syntax, they continue to be used as an elementary text book of the Arabic language. The more recent editions are by Causin de Perceval (Paris, 1818), Freytag (Bonn, 1823), Schier (Dresden, 1831), Cherbonneau (Paris, 1846; new ed., 1863), Léon and Henri Hélot, in French and Arabic, with illustrations of the provincialisms (Paris, 1847), and Dernburg (Berlin, 1850).

**LOLA MONTEZ**, a favorite of Louis I. of Bavaria, born in 1824, died at Astoria, N. Y., June 30, 1861. According to some authorities she was a native of Montrose, Scotland, and the illegitimate daughter of a Scottish officer named Gilbert, and according to others she was born in Limerick of an Irish father. Her mother was a creole who successively lived with or was married to natives of Spain and Great Britain, whence the conflicting accounts of Lola's origin. She received a good education in England, and married an officer named James, whom she accompanied to India. She left him after several years and led an adventurous life in Paris and other capitals. In 1846 she appeared in Munich as a Spanish ballet dancer, and captivated the heart of the Bavarian king by her beauty and accomplishments. Her influence became so great that the ultramontane administration of Abel was dismissed because that minister objected to her being made Countess Landsfeld. The students of the university were divided in their sympathies, and conflicts arose shortly before the outbreak of the revolution of 1848, which led the king at Lola's instigation to close the university. But a more violent outbreak early in March obliged the king to reopen that institution, and to discard Lola, who fled. Although her first husband was still alive, she contracted in 1849 a second marriage with an English officer named Heald. Prosecuted for bigamy, she went with him to Madrid, but soon deserted him. The two husbands died not long afterward. In 1852 she gave performances in New York, New Orleans, and San Francisco, and succeeded best in dramatic entertainments setting forth her own adventures. In California she married a Mr. Hull, but he did not live with her long. In 1855 she appeared at Melbourne, Australia, and subsequently lectured in the United States and England. She returned to New York in 1859, reformed her life, and died in poverty in a sanitary asylum.—See "The Story of a Penitent" (24mo, New York, 1867).

**LOLIGO.** See **SQUID.**

**LOLLARDS**, a name given to several religious associations in the middle ages. Its etymology has been variously explained. Some suppose that it comes from the Ger. *lullen*, to hum, so that the term would signify persons speaking at religious services with a low, suppressed voice; others consider it a term of reproach, derived from the old English word *loller*, a vagabond; others derive it from Matthew Lollaert, a Dutch heretic who was put to death. In some papal bulls and other documents, by a sort of pun, the term Lollard is used as a synonyme for *lollia*, the tares which grow up with the wheat of the church. The name first appears in the Netherlands about the year 1300, and was sometimes given to a religious congregation of men who devoted themselves to nursing the sick and burying the dead, and who called themselves Alexians; sometimes to the societies of the Beguins. In England it was applied to the adherents of Wycliffe as early as 1382, and in 1387 and 1389 it was used in episcopal documents. It remained a common appellation of the adherents of Wycliffe until the beginning of the reformation of the 16th century. The Lollards maintained all the principal doctrines of Wycliffe, especially that of the Scriptures being the only rule of faith. At his death their number in England seems to have been very great. A chronicler of that time remarks that it was difficult to meet two people in the street without one being a Wycliffite. John Hereford, doctor of theology in Oxford, John Ayshton, magister in Oxford, and John Purney, a friend of Wycliffe, were their leading men. In 1394 they petitioned the parliament for a reformation of the church. In 1401 an act of parliament *de hæretico comburendo* made death the penalty of heresy, and many suffered this punishment; among them, in 1417, Sir John Oldcastle, Baron Cobham. The last executions took place in 1430 and 1431. After that time the Lollards ceased to be numerous, and were found almost exclusively among the lower classes. But toward the middle of the 15th century a bishop of Chichester, Reginald Pecock, still mentions them in his principal work, "The Repressor," as "erring persons of the lay people whiche ben clepid lollards." He calls them in another part of his work "Biblemen," and mentions expressly that they possessed the New Testament in the native language, that they learned it by heart, and that they preferred the reading of the Bible to the instruction given by priests and scholars. In 1494 several Lollards, men and women, were prosecuted in the western district of Scotland; and in 1506 30 persons of Amersham, a principal seat of the Lollards, were punished for heresy. In the 16th century the Lollards gradually united with the reformed churches.

**LOLLI, Antonio**, an Italian violinist, born in Bergamo about 1728, died in Sicily in 1802. Little is known of his youth, and he seems

to have acquired his art without the assistance of teachers. After travelling extensively he was from 1762 to 1773 concert master to the duke of Würtemberg, and applied himself so assiduously to the mastery of his instrument that he utterly eclipsed at Stuttgart a rival artist, Nardini, who returned in despair to Italy. Between 1775 and 1778 Lolli was attached to the court of Catharine II. of Russia, who loaded him with honors. Subsequently he performed in London, Paris, and other capitals. He was most celebrated for playing quick movements, and attained a wonderful rapidity and facility of execution. His compositions are of little value.—His son Filippo acquired eminence as a performer on the violoncello.

**LOMBARD, Peter**, or **Petrus Lombardus**, an Italian theologian, born near Novara about the beginning of the 12th century, died in Paris about 1160. He first studied at Bologna, and St. Bernard placed him at the seminary of Rheims. He afterward entered the university of Paris, where he became a pupil of Abélard, and was so distinguished by his attainments that he was appointed tutor to Philip, son of Louis the Fat, and became professor of theology in the university, and in 1159 bishop of Paris, but soon relinquished this office in favor of Maurice of Sully. The most remarkable of his works is his *Sententiarum Libri IV.*, a collection of passages from the fathers bearing on controverted points in theology. It acquired a great reputation, being employed in the schools as a manual, and made the text of innumerable commentaries. It was from this work that he derived his designation "master of sentences." It is still in repute, and was reprinted in Paris (2 vols. 8vo) in 1841.

**LOMBARDY**, a division of northern Italy, lying between lat. 44° 54' and 46° 37' N., and lon. 8° 32' and 10° 50' E., and bounded N. by the Alps, which separate it from Switzerland and Tyrol, E. by Venetia, S. by Parma, Piacenza, and Liguria, and W. by Piedmont; area (inclusive of portions of Piedmont comprised in the province of Pavia), 9,085 sq. m.; pop. in 1872, 3,460,824. It is divided into the provinces of Bergamo, Brescia, Como, Cremona, Milan, Pavia, and Sondrio. The province of Mantua, formerly part of Lombardy, has been lately added to Venetia, reducing the area to about 8,000 sq. m. and the population to 3,104,838. The greater part of the country is a plain sloping southward from the Alps toward the river Po, and which, being profusely watered and highly cultivated under a genial climate, is one of the richest and most productive regions in the world. Sondrio and the greater part of Como and Bergamo are mountainous, lying on the southern slope of the Alps. Among the most celebrated summits on the borders of Lombardy is the Splügen. Immediately S. of the mountain region is a sub-alpine or hilly district, beyond which spreads the great plain. The principal rivers are the Po and its tributaries, the Ticino,

Olona, Adda, Oglio, Chiese, and Mincio. The lakes are large and important, and renowned for their picturesque beauty. The most remarkable are the Lago Maggiore and Lake Lugano, which are partly in Switzerland, the lake of Como, and the lake of Garda, the largest and one of the most beautiful of Italian lakes, separating Lombardy from Venetia on the east. The climate is healthy except in the marshy districts, and mild except among the mountains of the north. The winter lasts about two months, and on the plains snow scarcely ever remains on the ground. In the mountain region are forests of fir, oak, larch, birch, and chestnut. The southern declivities of the mountains produce the vine, the mulberry, and a variety of fruit trees common to the temperate zone. The sub-alpine region and the great plain produce silk, wine, maize, millet, chestnuts, orchard fruits, and vegetables. The mineral products of Lombardy, comprising iron, copper, lead, alabaster, &c., are unimportant.—The Lombards are fine types of the Italian nation, blending the most attractive qualities common to all their countrymen with some of the characteristics peculiar to the Teutonic races. They are generally intelligent and amiable, and fine specimens of physical beauty abound among both sexes. Education is widely diffused. The dominant religion is the Roman Catholic, but the number of Protestants is increasing; that of Jews hardly exceeds 3,000. More than two thirds of the population are employed in agriculture. The country is better cultivated than any other in Europe. Irrigation, for which the streams afford ample facilities, is universally and skillfully employed. The water of the rivers is so distributed by canals that there are few farms without a copious supply. The purchase and sale of water for irrigation forms a business of much importance, and is conducted with great strictness, the volume of water being accurately measured and paid for at a high rate. Great attention is bestowed upon meadows, and the maintenance of live stock in the best possible condition. The chief labor of ploughing is performed by oxen. The live stock is fed entirely in stalls on grass, which can be cut from the meadows all the year round. Pigs are fattened on Indian corn. Horses, mules, and asses are employed for draught. The dairies are extensive, and are managed with great care and with the most scrupulous cleanliness. They produce immense quantities of excellent cheese, known throughout Europe as Parmesan from having been originally exported from Parma. The farms are generally small, most of them varying in size from 7 to 25 acres. The most numerous class of cultivators, called *coloni* or colonists, occupy cottages with less than three acres of land. Silk is the staple production. Rice was introduced from the East as early as the 10th century, but its cultivation is restricted by the government on account of its insalubrity.

Maize is the grain most extensively raised, one third of the arable land being devoted to it. The average product per acre is said to be 25 bushels, and on the richest lands from 50 to nearly 80 bushels. Wheat is chiefly raised in the alpine region. The grape vines are trained upon trees, and extend in graceful festoons from one tree to another. Wine is abundant, but generally of inferior quality. Potatoes are little cultivated, and their production is almost exclusively confined to the alpine region; they are not relished by the people, and most attempts to extend their cultivation have failed. The chief manufacture is that of silk, but cotton, woollen, and flax manufactures are likewise extensive; and there are considerable iron works in various parts of the country.—Lombardy was anciently a part of Cisalpine Gaul. It owes its present name to the Lombards, Longobardi, or Langobardi, an ancient Germanic people of Suevic race, whose name is derived in some of their national writings from their habit of wearing long beards, while some modern critics derive it from Ger. *lang*, long, and *Barte*, in Old German a battle club, or from *lang* and *Börde*, in Low German a bank of a river. The last refers to the banks of the Elbe, where they first appear in history in the time of the emperor Augustus. Having figured for some time in the history of Arminius and Marbodius, they soon after disappeared, and in the 5th century reappeared in Hungary on the northern bank of the Danube, which they crossed in the following century after a successful war of extermination against their former masters, the Heruli. South of the Danube, in Pannonia, they carried on a protracted war against the Gepidæ; and after the final annihilation of their enemies they crossed the Julian Alps under their victorious king Alboin, and in northern Italy founded, in 568, a powerful state, with feudal institutions. Their kingdom lasted for more than 200 years, their most remarkable monarchs being Autharis, who embraced Christianity; Rotharis, who promulgated a code of written laws in 643; Grimoald, who reformed the laws of the preceding; Luitprand, who conquered Ravenna in 728; Astolphus, who attempted the conquest of Rome; and Desiderius, with whom the kingdom ended, being conquered by Charlemagne in 774. Under the successors of the latter the Lombard cities, with Milan at their head, grew prosperous and powerful, and adopted republican institutions. After a long struggle with the emperors, these cities became independent by the treaty of Constance in 1183. The family of the Visconti soon afterward became powerful in Milan, of which city Giovanni Galeazzo Visconti became duke in 1395, with an extensive territory. His daughter Valentina married Louis, duke of Orleans, whence arose in the early part of the 16th century a claim on the part of France to the duchy, which was then in possession of the house of

**Sforza.** The emperor Charles V. supported Francesco Sforza against the French, and in 1540, after Francesco's death, bestowed Milan as a vacant fief of the empire on his son Philip II.; and it continued to be a possession of the Spanish crown till 1706, when it was annexed by Austria. In 1796 Bonaparte conquered Lombardy, and it became successively a part of the Cisalpine republic, of the Italian republic (1801), and of the kingdom of Italy (1805). It was restored to Austria after the downfall of Napoleon by the treaties of 1815, and was united with Venice to form the Lombardo-Venetian kingdom of the Austrian empire. By the treaty of Zürich, Nov. 10, 1859, the whole of Lombardy, with the exception of the fortresses of Mantua and Peschiera, was added to the dominions of Victor Emanuel, to which these fortresses with all Venetia were also annexed by the treaty of Vienna of 1866.

**LOMBOK** (native, *Tanak Sassak*), an island of the Indian archipelago, separated by the strait of Lombok from Bali on the west, and by the strait of Allas from Sumbawa on the east; area, about 1,850 sq. m.; pop. about 250,000. The island is nearly square, with a narrow peninsula projecting from the S. E. angle. It is crossed by two mountain ranges, nearly parallel; that on the N. side culminates in the peak of Mt. Rinjani, an extinct volcano, 8,000 ft. high; the other range follows the S. shore. Between these two is an undulating plain which is well watered and very fertile. There are many rivers, most of which empty into the two straits. The island is of volcanic formation, while in the straits on either side are several small coral islands. The coasts along these straits are indented with several very fine harbors. Oranges, bananas, jambas, and rambutans grow abundantly, and there are extensive forests of cocoa trees. Rice is cultivated with great skill, and large crops are produced. Cotton, coffee, maize, and tobacco are also raised. Hogs, goats, and fowls abound, and small hardy horses, oxen, and buffaloes are bred for exportation. Among the native birds are green doves, black cuckoos, golden orioles, and white cockatoos. No tiger or other feline animal exists on the island. In passing eastward across the strait of Lombok, there is a sudden change in the fauna, from an Asiatic to an Australian character. The inhabitants of Lombok are said to be more civilized than those of the neighboring islands. They are especially skilful in the manufacture of firearms and cutlery, and their *krises* or daggers are in demand throughout the archipelago. The exports are cattle, hides, horns, cotton, tobacco, cocoa oil, dried beef, and timber; the chief imports are opium, liquors, coarse cloths, raw silk, metals, and porcelain. The chief town is Amponan, on the strait of Lombok. Four miles inland from this is the village of Mataram, the capital. The government is an absolute monarchy, mildly administered. The governing class are Brahmins, but the common

people are all Mohammedans. The numerous petty chiefs are frequently at war with one another. In 1815 a great eruption of a volcano on Sumbawa, 60 m. away, sent such showers of ashes over Lombok that many of its fertile fields were rendered desolate, and thousands of the inhabitants perished. From this calamity it has but slowly recovered.

**LOMÉNIE, Louis Léonard de**, a French author, born at St. Yrieix, Haute-Vienne, in 1818. He is descended from the family of the cardinal Loménie de Brienne, who was comptroller of finances in 1787 and prime minister for a few months in 1788, and died from the brutal treatment of the revolutionists in 1794. He early applied himself to literature in Paris, and published, under the pseudonyme of *Un Homme de Rien*, a series of political and literary biographies known as the *Galerie des contemporains illustres* (10 vols. 18mo, Paris, 1840-'47). In 1845 he was selected as the substitute of J. J. Ampère in the chair of French literature at the collège de France, and in 1864 became permanent professor, in which office he has since been succeeded by Guillaume Guizot; but he holds a professorship in the polytechnic school. Many years since he commenced the publication in different periodicals of another series of biographical sketches, *Les hommes de '89*, but their issue was suspended. His most valuable work is *Beaumarchais et son temps, études sur la société française* (2 vols. 8vo, 1855; 2d ed., 1858). This was translated into English in 1857 (4 vols.), and abridged in New York. In January, 1874, he was elected a member of the French academy as successor of Prosper Mérimée.

**LOMOND, Loch**, the largest lake in Scotland, 15 m. N. W. of Glasgow, lying between Dumbartonshire on the west and the counties of Perth and Stirling on the east. It is 24 m. long, and has its greatest width, about 7 m., near the S. end, from which it contracts until at the N. extremity it is less than 1 m. wide. Its depth also varies greatly, seldom exceeding 60 ft. in the S. portion, while toward the north it increases to nearly 600 ft. Its surface is only about 22 ft. above the level of the sea. The lake contains a number of islands, receives the Endrick and a large number of rivulets, and discharges its surplus waters into the frith of Clyde by the river Leven. Loch Lomond is celebrated for its grand scenery, being surrounded by high and rugged mountains toward the north, the most conspicuous of which are Ben Lomond on the east and the Arrochar hills on the west, and toward the south by an elevated and diversified country dotted with villas. Steamers ply on the lake. Rob Roy's cave, or the Cave of the Rock, at the base of Ben Lomond, on the banks of the lake, is celebrated as having been the hiding place of that famous freebooter; and in former times Robert Bruce found a secure shelter in the same locality.

**LOMONOSOFF, Mikhail**, a Russian poet, born near Kholmogor, in the government of Arch-

angel, in 1711, died in St. Petersburg in April, 1765. He was the son of a fisherman. With the aid of a priest he acquired some knowledge, and clandestinely repaired to Moscow, where he found ample protection and the means to complete his studies at St. Petersburg and elsewhere. After studying mathematics at Marburg and mineralogy at Freiberg, he returned to St. Petersburg, and was made an associate of the academy, professor of chemistry, and in 1760 rector of the university. He wrote works on history, rhetoric, astronomy, chemistry, and other branches of science; but his fame rests chiefly on his poetical writings, especially his odes, and on his grammar of the Russian language. The academy of sciences of St. Petersburg published his works (6 vols., 1794; new ed. by Smirdin, 3 vols., 1847); and his biography has been written by Polevoi (2 vols., 1836).

**LOMZA** (Pol. *Lomża*). I. A W. government of Russia, in the kingdom of Poland, bordering on Prussia and the governments of Suwalki, Grodno, Siedlce, Warsaw, and Plock; area, 4,401 sq. m.; pop. in 1867, 456,429. It is watered by the Bug and its affluent, the Narew. It formerly belonged to Masovia, and a portion of the province was for some time annexed to Prussia. The principal towns are Lomza, Pultusk, and Ostrolenka. II. A town, capital of the government, on the Narew, 70 m. N. E. of Warsaw; pop. in 1867, 10,340. It has a gymnasium, a Piarist college, an arsenal, paper mills, and manufactories of leather and woollen goods. It was once a place of considerable importance, but was destroyed by the Swedes, and has never recovered its former prosperity, though the population has greatly increased within the last generation.

**LONDON**, the metropolis of Great Britain, situated on the Thames, 60 m. W. from the sea by the course of the river to the Nore light, and 40 m. in a straight line; lat. (of the centre of the dome of St. Paul's cathedral) 51° 30' 48" N., lon. 0° 5' 48" W. It includes parts of the counties of Middlesex, Surrey, and Kent, extending N. and N. W. to Clapton, Highgate, and Hampstead; E. and S. E. to Bow, Barking, Plumstead, and Eltham; S. and S. W. to Sydenham, Norwood, Tooting, Wandsworth, and Fulham; S. and W. to Hammersmith and Wormwood Scrubs; area, 122 sq. m. The population increased from about 50,000 in the 12th century to nearly 200,000 in the 17th. In 1801, by the first systematic census, it was 958,863; in 1821, 1,378,947; in 1841, 1,948,417; in 1861, 2,803,989; and in 1871, according to the census statistics of the metropolitan board of works, 3,266,987. The ratio of increase from 1841 to 1851 was 19·7 per 1,000; in 1851-'61 it declined to 17·3, and in 1861-'71 to 15 in the metropolis proper, but respectively advanced to 27·7 and to 42 in the outlying districts. The registrar's tables for 1871 give the population of the various divisions of the metropolis as follows:

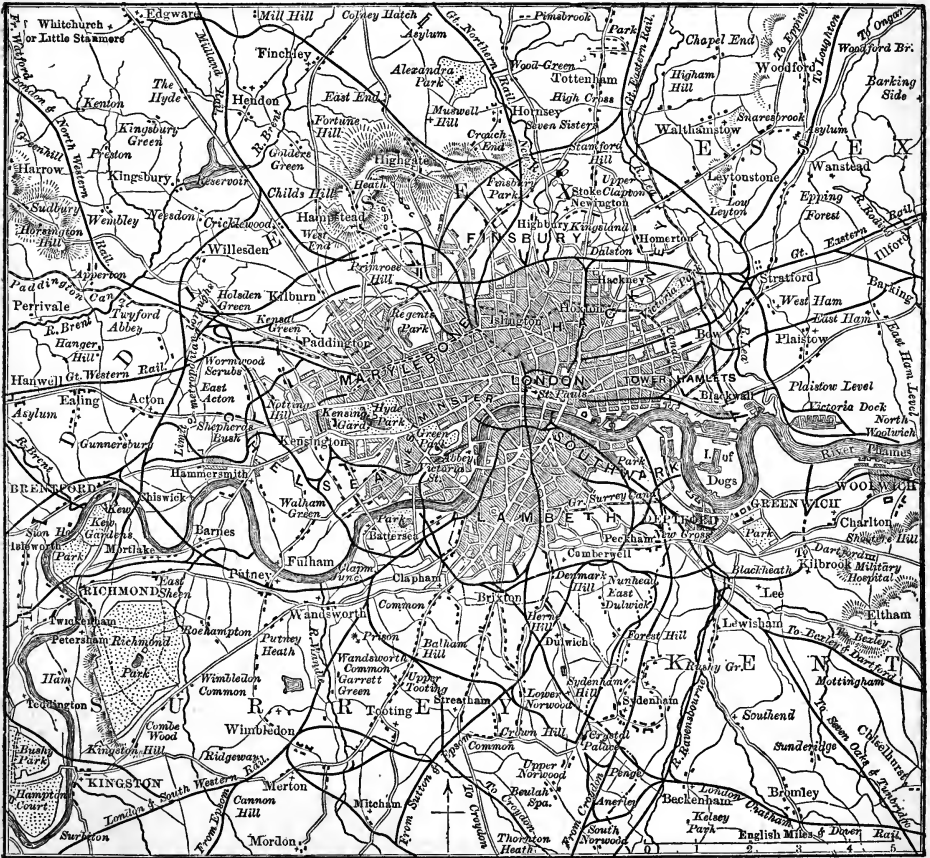
DIVISIONS.		Population.	
<i>West Districts.</i>			
Kensington.....		288,153	
Chelsea.....		71,089	
St. George, Hanover Sq.		155,986	
Westminster.....		51,181	
<i>North Districts.</i>			
Marylebone.....		159,254	
Hampstead.....		82,281	
St. Pancras.....		221,465	
Islington.....		213,778	
Hackney.....		124,951	
PART OF MIDDLESEX.	<i>Central Districts.</i>		
	St. Giles.....		58,556
	Strand.....		41,889
	Holborn.....		163,491
London City.....		73,958	
<i>East Districts.</i>			
Shoreditch.....		127,164	
Bethnal Green.....		120,104	
Whitechapel.....		76,573	
St. George in the East.....		48,052	
Stepney.....		57,690	
Mile End, Old Town.....		93,152	
Poplar.....		116,376	
		2,286,563	
PART OF SURREY.	<i>South Districts.</i>		
	St. Saviour, } Southwark		175,049
	St. Olave, }		122,393
	Lambeth.....		208,342
	Wandsworth.....		125,000
Camberwell.....		111,306	
		742,155	
PART OF KENT.	Greenwich.....		100,600
	Lewisham.....		51,537
	Woolwich.....		73,380
		225,587	
Total.....		3,254,260	

Of the total population returned by the registrar in 1871, 3,029,260 were born in England and Wales, 41,029 in Scotland, 91,171 in Ireland, 20,324 in the colonies and India, 5,170 in the islands of the British seas, and 1,205 in ships at sea. The remainder, 66,101, were foreigners, nearly half Germans, and the rest comprising almost all nationalities. The population was estimated by the registrar in the middle of 1874 at 3,400,000. The postal district covers an area of 250 sq. m. The metropolitan police district comprises many towns, villages, and parishes formerly independent, and still often spoken of as such, and extends over the whole of Middlesex (exclusive of London City, which has its own police) and the surrounding parishes in the counties of Surrey, Kent, Essex, and Hertford, of which any part is within 12 m. of Charing Cross, and not over 15 m., embracing an area of 687 sq. m. and a population in 1871 of 3,803,360, or including the City police district 3,883,092, being one eighth of the whole population of the United Kingdom, and 500,000 more than that of all Scotland. This does not include transient residents, whose number is immense at all times, and especially between May and August, when the patricians, politicians, and votaries of fashion are in town, together with many interested in parliamentary business. At this time London is most brilliant, the West End resembling a fashionable watering place, where distinguished people unite affairs of state with



social pleasure, and where the rush from the club houses to parliament, to galleries of art, to the drives in the parks and gardens, and to the opera, balls, and receptions, is incessant. Autumn and winter find the West End comparatively deserted, but with the pleasant walks along the new embankments and increasing improvements, and the animation of the popular thoroughfares and the business regions, the metropolis is at all times attractive, and full of boundless resources and of grandeur, although the atmosphere is always lurid with the smoke

of coal, and is often foggy and damp.—The following are the ten parliamentary boroughs of the metropolis: City of London (pop. in 1871, 74,732), Westminster (246,413), Chelsea (258,011), Marylebone (477,555), Hackney (362,427), Finsbury (443,316), Tower Hamlets (391,568), Lambeth (379,112), Southwark (207,335), and Greenwich (167,632). Their population is only about 3,000,000, the remainder belonging to non-metropolitan electoral districts. The City, though containing a much smaller number of residents than any of the other



London and its Environs.

boroughs, and which further declined between 1861 and 1871 to the extent of 40,000, is on account of its commercial and financial importance represented by four members of parliament, and the other nine boroughs by two each. The city of London proper, the original nucleus of the metropolis, and called distinctively "the City," has for its base the N. bank of the Thames, with its W. line extending to Middle Temple lane, where, crossing Fleet street at Temple Bar and Holborn at Southampton buildings, it skirts Smithfield,

Barbican, and Finsbury circus on the north; traversing the end of Bishopsgate street Without, and proceeding southward down Petticoat lane across the end of Aldgate street and along the Minories, it finally reaches the Thames at the tower of London. The City comprises 110 parishes, four of which are without the walls. Westminster is bounded N. from Tottenham Court road to its suburban limit at Kensington gardens, by Oxford street; while on its extreme W. side, crossing the centre of the Serpentine in Hyde park, it reaches the

river at Chelsea hospital. It includes the district of the Savoy and the lordship of the duchy of Lancaster, which are situated between the Strand and the river. Tower Hamlets adjoins the city of London and Finsbury on the west; Finsbury adjoins Westminster and Marylebone on the west, and the west part of the city of London on the south. Marylebone is chiefly in the Regent's park district in the West End; Southwark and Lambeth are on the Surrey side; Greenwich comprises Deptford, Woolwich, and other places; Hackney, a N. district forming part of Tower Hamlets, and Chelsea, in the West End, became separate boroughs in 1867.—The Thames runs through the centre of the city, and is spanned by many bridges. Most frequented is London bridge, over 900 ft. long, with a daily traffic of 25,000 vehicles and countless multitudes constantly passing between the city and the other side of the river; tunnels have been built and are in course of construction under the bridge to relieve the pressure. Westminster bridge, 1,200 ft. long, finished in 1862, is double the width of the old bridge, and consists of seven iron arches resting on stone piers with foundations descending 30 ft. below low water. Blackfriars bridge was replaced in 1869 by a new one nearly 1,300 ft. long, with five iron arches; it was opened in 1870 at the same time with the N. Thames embankment. Close to Blackfriars is the Alexandra lattice bridge of the London, Chatham, and Dover railway, carrying four lines of rails to Ludgate hill station. Southwark bridge, 700 ft. long, with three iron arches, dates from 1819; the penny toll was abolished in 1865, and it became city property in 1868. Waterloo bridge, one of the finest in the world, is 1,240 ft. long, with nine elliptical arches; it was opened on the second anniversary of the battle of Waterloo in 1817. The halfpenny toll is annually paid by about 3,000,000 persons. Vauxhall bridge, dating from 1816, is 800 ft. long, with nine arches, and extends from Vauxhall to Millbank. Albert bridge, 800 ft., the longest and most substantial of the suspension bridges, extends from the Chelsea embankment to Battersea park, and was opened Aug. 23, 1873. An iron bridge was opened in 1874 from Wandsworth to Fulham, midway between Battersea and Putney bridges. The Charing Cross or Hungerford (dating from 1863) replaced Hungerford suspension bridge, and there are various other bridges.—The greatest recent improvements are the river quays or Thames embankments. The northern or Victoria embankment, 100 ft. wide, and costing nearly £2,000,000, was opened in 1870; it forms a matchless public way between Westminster and Blackfriars bridges, following the easy curve of the river, with the houses of parliament at one end and St. Paul's at the other, Waterloo bridge and Somerset house midway, and all along in sight of the Thames with its ever-crowded shipping.

The southern or Albert embankment, completed about the same period at a cost of £1,100,000, runs from Westminster bridge nearly to Vauxhall bridge, with the new St. Thomas's hospital, a long range of buildings, facing the houses of parliament and extending from the foot of Westminster bridge to Lambeth palace; but this embankment, though superior to the northern one in the edifices bordering it on the land side, has the disadvantage of terminating somewhat abruptly among the potteries, gas and chemical works, and other unsavory establishments of Lambeth. The Chelsea embankment, opened May 9, 1874, begins at Chelsea hospital gardens, where it joins the embankment constructed some years ago to the old Battersea bridge, presenting along that space a massive granite wall to the river, and on the land side an unbroken roadway 70 ft. wide. For a considerable distance it is flanked by pleasure grounds; and though much less costly and less ornamented than the northern and southern embankments, it is almost equally grand. New groups of streets, buildings, and shops cluster round the new embankments and their various continuations, while many others are in course of construction.—The most northerly of the longitudinal lines of street parallel to the river enters the metropolis on the west by the Bayswater road, and traverses Oxford street, Holborn, and Newgate street, till it reaches Cheapside; it next passes through the Poultry, having the bank of England and the royal exchange on the one hand, and the mansion house on the other, along Cornhill to Leadenhall street, and is thence continued by Whitechapel and the Mile End road, which leads to Essex and the eastern counties. The other great longitudinal line begins on the west at Hyde Park corner, passing Kensington gardens, part of Hyde park, and the Green park. On the E. end of Piccadilly the continuous line of street diverges to the right through the Haymarket, whence it proceeds to the east along E. Pall Mall, through Trafalgar square, past St. Martin's church, till it reaches the Strand. The great line is thence continued through Fleet street and Ludgate hill, till it arrives at St. Paul's cathedral. At the N. E. end of St. Paul's churchyard it joins the great northern street line which runs from the Bayswater road; but another branch of the former line runs nearer the river through Watling street, Eastcheap, and Tower street to Tower hill, whence it may be followed either in a straight line through Radcliffe highway, N. of the London docks, or close by the river along Wapping and Shadwell, where the lines unite in a single street, leading to the West India docks. Another line of street which unites with that last described begins at Vauxhall bridge, and runs through Abingdon street until it has Westminster abbey on the left and the houses of parliament and Westminster hall on the right. Leaving these, with Westminster bridge on the right, it joins Parliament street and Whitehall,

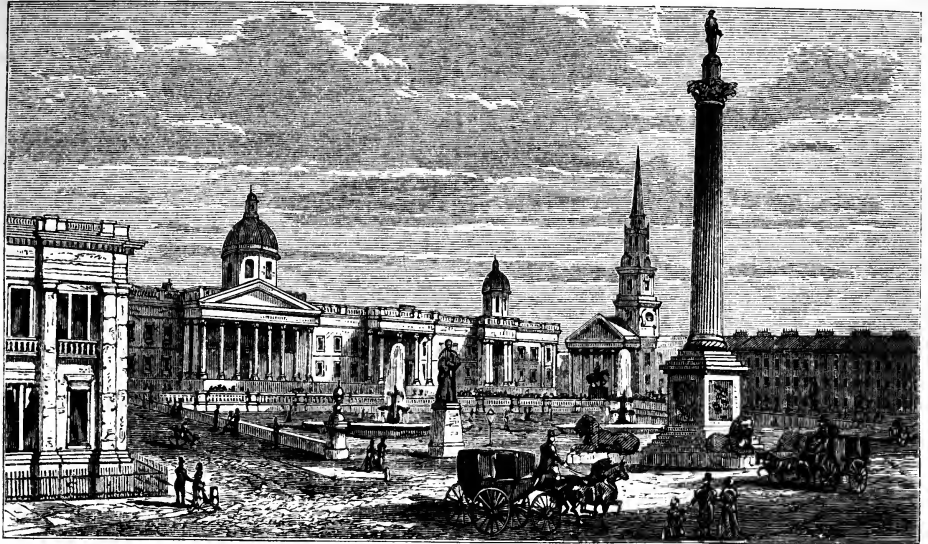
the latter separating it from St. James's park on the left. Beyond Whitehall is Charing Cross, where the line, bending E. with the river, unites with the Strand. Among the streets running from N. to S., the principal and most westerly is the Edgeware road with its continuations, Park lane, Grosvenor place, and Vauxhall bridge road, which for the most part form the western boundaries of the metropolis. The second line of street proceeding eastward is the thoroughfare formed of Portland place, Regent street, and Waterloo place, extending between Regent's and St. James's parks; a little north of Piccadilly it curves through the Quadrant, and continues northward to Oxford street, where it expands into a circus, and then, resuming its former dimensions, proceeds to Langham place, where by a slight curve westward it continues into Portland place, Park crescent, and Park square, leading to Regent's park. The third great line is a continuation southward of the road from Hampstead, passing through Tottenham Court road to the E. end of Oxford street, from which point it proceeds through narrow streets down St. Martin's lane to Charing Cross. The chief N. line connecting the city with its northern suburbs is composed of Gray's Inn lane, which runs from Holborn hill to the Euston, formerly the New road; Aldersgate street and Goswell street, leading in a direct line from the post office to Islington; and the street commencing at the Regent's canal on the north, successively called Kingsland road, Shoreditch, Norton Folgate, Bishopsgate street, and Gracechurch street, connecting Kingsland and Hoxton with London bridge and Southwark, the street line passing at the S. end of Gracechurch street over London bridge, and thence prolonged for some distance through the Borough, the main thoroughfare of Southwark. Another line connects Finsbury circus with London bridge; and Cannon street extends from King William street to St. Paul's, and connects with the same bridge. Vast lines of street on the north proceed from Uxbridge road to King's Cross, St. Pancras, and thence to Finsbury square, and extend under the names of New road and the City road almost completely round the north and east of the metropolis. On the Southwark and Lambeth or Surrey side six great roads converge from the different bridges to the Elephant and Castle tavern. From this point the roads, the principal of which is the Blackfriars road, again diverge, the Kent road leading to Greenwich, the Kennington and Newington roads to Brixton and Tulse hill, and the road southward to Sydenham. Many new thoroughfares have sprung up near the Holborn viaduct, one of the most magnificent recent improvements. The new Queen Victoria street is the eastward continuation of the northern embankment through the heart of the City. A broad thoroughfare was opened in 1871 from High street, Whitechapel, to the Commercial road, connecting the City with the East and West India docks and Blackwall; and

many others have been opened or are in progress.—The principal E. and W. lines of street run from Mile End road to Hyde Park corner, through the heart of the City (the great landmarks of which are St. Paul's, the bank of England, the royal exchange, and the mansion house), through Cheapside, Fleet street, the Strand, and Charing Cross; or on the north of Cheapside along Newgate street, the Holborn viaduct, and Oxford street. N. of these lines sweep the Euston road (the longest road of London, nearly 3 m., leading to Regent's park), St. John's Wood, and the Edgeware road and City road, which run from the Angel tavern at Islington to Finsbury square. Another line of traffic of vast extent passes over London bridge, already mentioned. Just below the bridge is the Pool, with its fleets of colliers moored in the stream; above it are the stairs of the penny and twopenny steamboats. At the foot of the bridge is Fishmongers' hall. Fish street hill, nearly opposite, contains the most picturesque of all metropolitan monuments, erected in commemoration of the great fire; and at the entrance of King William and Cannon street is the statue of William IV. Among the most bustling streets are Upper and Lower Thames street, with the custom house, Bishopsgate street Without and Within, Gracechurch street, Leadenhall street, Fenchurch street, Cornhill, Cheapside, and Queen Victoria and other new streets. At the intersections of Gracechurch with Cornhill and Leadenhall streets and Lombard and Fenchurch streets nearly 60,000 persons cross in the aggregate in the course of nine hours during the day; at the junctions of streets around King William IV.'s monument, King William street, the traffic within the same space of time is estimated at over 40,000 persons, and between the bank of England and the mansion house at nearly 60,000. These are the most dangerous crossings in the City. It has been ascertained that more than 700,000 persons enter the city of London every morning and leave it again every evening, and that 60,000 vehicles enter it every 24 hours. The by-streets of Cheapside are filled with Manchester wholesale houses, and the street itself as well as Cornhill displays a variety of jewellers', goldsmiths', watchmakers', saddlers', and other shops. St. Paul's churchyard, Ludgate hill, and Fleet street are also popular localities for shopping; and from the most distant parts in the East End almost all the houses contain shops, which increase in attractiveness in proportion as they advance westward. Cheapside has long been famous for its traffic. Tournaments were formerly held there, and along it still proceeds annually the antiquated and grotesque turnout on lord mayor's day. One of its cross streets, King street, leads to the guildhall, and Queen street leads to Southwark bridge. The mansion house, the official residence of the lord mayor, is bounded E. by the Poultry (enlarged in 1874), which is a continuation of Cheapside, and the new Queen

Victoria street connects the mansion house with Blackfriars bridge. The whole neighborhood teems with new buildings and stores. In St. Martin's-le-Grand is the new post office, substantially completed in 1874, facing the old site, and extending from Newgate to Bath and Angel streets, the principal front being 286 ft., and the end fronts 142 ft. long. Newgate prison in the Old Bailey, the seat of the central criminal court (of which the recorder, the first law officer of the City, is the chief judge), and where those sentenced to death are hanged, throws a gloom over the City. In the vicinity is the Charterhouse in Aldersgate street. The Holborn viaduct, opened in November, 1869, has been lined with new rows of buildings and shops, and is doing much to relieve the traffic on other roads. The law region of Gray's Inn and Chancery lane lies among the cross streets of Holborn. Some of the unseemly by-streets between Holborn and the Strand are rapidly disappearing, though enough are left to mar the locality. Holborn leads into Oxford street (so called from being on the former highway from London to Oxford), running between St. Giles's pound and old Tyburn (now Cumberland gate), and was formerly known as Tyburn road. New Oxford street occupies (since 1847) the site of the so-called "rookery" of St. Giles's, long a notorious resort of the dangerous classes, nearly 3,000 of whom were crammed in 1849 into fewer than 100 adjoining hovels; but these slums have almost disappeared. Oxford street is well patronized by the substantial middle classes, and is one of the most animated and spacious streets of London. At right angles with it is Tottenham Court road, leading into Hampstead road, a popular thoroughfare of the working classes, containing many furniture and other shops, and crowded on Saturday evenings with purchasers of provisions for Sunday. On proceeding from the east to the west through Ludgate hill, the most conspicuous building is St. Paul's cathedral, of which a finer view is now obtained from the recent removal of the railings in front of the church. St. Paul's churchyard is the name applied to an irregular group of houses enclosing the cathedral and its burial ground; and near by is Paternoster Row, the headquarters of eminent publishers and booksellers. A number of small streets connect the hill on which St. Paul's stands, said to be the highest ground in the city, with Blackfriars bridge. In Water lane is Printing House square, occupied by the offices of the "Times." At the base of Ludgate hill formerly ran the Fleet ditch, now a covered sewer, which gave the name to Fleet street. The famous Fleet prison has been converted into a freight depot for a railway station. Newspaper offices abound in this street and in the surrounding series of courts. It terminates at Temple Bar, which was long the official boundary between the West End and the City, the keys of which were here handed by the lord

mayor to the sovereign on royal visits to the East End. Temple Bar, which is about to disappear (1874), celebrated the second century of its erection in 1872, after having long enjoyed a credit for antiquity to which it had no claim, from the fact that Lud gate, the real western gate of the City proper, has long since disappeared, the comparatively modern structure having been erroneously regarded as one of the veritable gates of mediæval London. Between Temple Bar and Holborn is Lincoln's Inn Fields, one of the best squares of London, and a great legal centre.—The Strand extends from Essex street (a little beyond Temple Bar) to Charing Cross, and is among the most cheerful and animated central thoroughfares, with many streets extending on its S. side to the river, and with the sites of Durham house, York house, where Bacon was born, and many other memorable localities, including Essex house, Arundel house, and Maypole (now St. Mary-le-Strand) church. It contains also Somerset house, with the internal revenue and other offices, Exeter hall, King's college, several theatres, and various public institutions. Among its many adjacent curious lanes and streets is Wych street, leading to Drury lane; and close by is a labyrinth of alleys and lanes literally swarming with the poorest class of people, chiefly Irish. Another curiosity is Holywell street, with its old book and old clothes stalls. The best known by-streets of the Strand are Southampton, Craven, Wellington (connecting with Waterloo bridge), Adam (with Adelphi terrace), Bedford, Catharine, and King William streets, many of them containing comparatively cheap hotels and boarding houses. At the western extremity of the Strand is Charing Cross, with a magnificent railway station, celebrated for its architecture. Charing Cross and Trafalgar square (called by the late Sir Robert Peel the finest site of Europe, but somewhat deformed by the want of proportion in the Nelson and other monuments) are the great turning points from Whitehall and various parts of the West End and N. W. to the City, and, from their proximity to the club houses, the houses of parliament, and the galleries of art, are among the most animated localities in the metropolis, particularly during the season, when cabs start thence in all directions in great numbers, Charing Cross being the official centre of the service. S. W. of Charing Cross are Whitehall, Downing, and Parliament streets, all greatly improved by the new government buildings, the foreign and India offices having been completed for several years, and the home and colonial offices approaching completion in 1874. Old houses have been pulled down, and the thoroughfare has been widened so as to form a continuous connection with Charing Cross, and to present a nobler view of Westminster abbey and the new houses of parliament. The projected demolition of the admiralty, to make room for new streets, and the doom of North-

umberland house, which was sold in 1873 for about £500,000 to the board of works, deprive Charing Cross and vicinity of the most time-honored edifices. Waterloo place is one of the centres of club houses and of social and political life, and opens to view the noble park



Trafalgar Square.

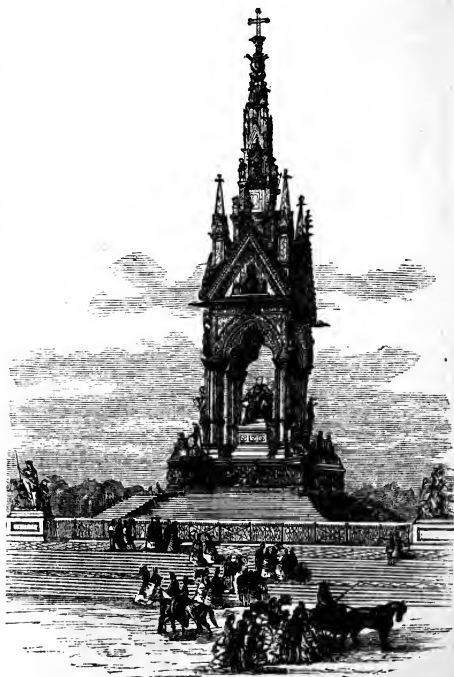
front of Carlton terrace, on the former site of Carlton house. Pall Mall extends from the foot of St. James's street to the foot of the Haymarket, and was as favorite a resort of the wits of Queen Anne's time as it is of the fashionable world and politicians of the present day. Between Charing Cross and Regent street it is called Pall Mall east, and thence to St. James's street simply Pall Mall. In Pall Mall are the British institution, the new society of painters in water colors, Marlborough house (the residence of the prince of Wales), and the principal clubs. At the end of the Mall is St. James's palace. St. James's street, also celebrated for its club houses, commences at St. James's palace and extends to Piccadilly. In King street, near by, are Willis's rooms, where the once fashionable balls of Almack's were held. Haymarket, with the Haymarket theatre and Her Majesty's theatre, is chiefly occupied on its W. side by restaurants and oyster shops. At night it was formerly the resort, according to Dickens, "of the worst company in London, male and female," particularly in the direction of Coventry and Regent streets. From Drury lane, not far distant from Great Russell street, where the British museum is, Long Acre, much occupied by carriage builders, leads to Leicester square. The Haymarket, the fine opening of Waterloo place and Regent street, Covent Garden, and other well known localities, communicate with Piccadilly, which is one of the most brilliant streets of the metropolis, particularly at its W. entrance from Hyde Park corner, with Apsley

house on the one hand and the arch surmounted by an equestrian statue of the duke of Wellington on the other, near Constitution hill and the Green park. It is mentioned for the first time in the latter part of the 16th century by Gerarde, who remarks that "the small wild buglosse grows upon the dry ditch banks about Pickadilla." It continues to be one of the great points of egress from London, although the White Horse cellar, whence the mail coaches started for the west of England, which made Hazlitt say "that the finest sight of the metropolis is that of the mail coaches setting off from Piccadilly," has lost its bustle since the introduction of railways. Piccadilly communicates with the chambers in the Albany, and through Park lane, one of the most beautiful and select streets of the West End (widened in 1873-'4), with Oxford street. Bond street, on the right of Piccadilly, is celebrated for its fashionable throng during the season, and its tradesmen are well patronized by the ladies of the aristocracy. In the vicinity are Burlington arcade, Burlington street, and Saville row, the latter inhabited by many physicians. Regent street, the handsomest street of London, commences at St. Alban's street, crosses Piccadilly and Castle street, where it forms a quadrant, and then crosses Oxford street to Langham place, where it opens into Portland place. It is lined with the most diverse and attractive establishments, and is a favorite resort of shopping ladies and of promenaders and idlers. In the neighborhood of Portland place are the polytechnic institution and the



national institute of fine arts. The Edgeware road, a great and popular thoroughfare, leads from the W. end of Oxford street, and proceeds due N. to St. John's Wood, which is a charming locality, most of the houses being provided with gardens and almost entwined in flowers and evergreens. Bayswater, Maida hill, and almost all the streets clustering round Kensington gardens and Kensington proper, contain delightful residences, which are eagerly sought by City people; the population of Kensington, with Brompton, Hammersmith, and Fulham, has consequently increased from 185,000 in 1861 to 283,000 in 1871, and about 325,000 in 1874. Other airy localities have largely increased, especially Islington, which had 155,341 in 1861 and 213,749 in 1871. The Harrow road, diverging from the Edgeware road, leads to the famous village and school of that name, as well as to Kensal Green cemetery. Mayfair, including Curzon street, Hill street, Chesterfield house, Berkeley square, and a large portion of the streets and squares between Piccadilly and Grosvenor square, built mostly on ground belonging to the duke (late marquis) of Westminster, was for nearly 100 years, until the rise of Belgravia, the great centre of high life. Sydney Smith said that the parallelogram between Piccadilly, Bond street, Park lane, and Oxford street included more of beauty, wealth, wit, and fashion than any other part of the world. Tyburnia, the northern wing of the West End, is principally inhabited by professional men, merchants, and artists. Belgravia, the southern wing of the West End, built between 1826 and 1852, includes Belgrave and Eaton squares, and is the most fashionable locality in the West End. In this vicinity are Brompton and Chelsea. N. E. of Tyburnia is the Regent's park district, extending from the N. side of the Euston (formerly New) road to Camden Town and Somers Town. Between 1849 and 1873 6,578 new streets were laid out in the police area, and 262,563 houses built.—The squares are numerous, and those in the West End are remarkable for their fine trees, but in other respects they are imperfectly cultivated. The best known West End squares are Belgrave, Eaton, Portman, Manchester, St. James's, Berkeley, and Hanover; the most fashionable is Grosvenor square, and the most salubrious and best cultivated is Cavendish square. Among the largest are Eaton (also one of the most select), 1,637 by 371 ft.; Cadogan, 1,450 by 370; Bryanston, 814 by 198; and Montagu, 820 by 156. Most of those previously mentioned range from 500 to nearly 700 ft. Two other divisions of squares are situated between Regent street on the west and Gray's Inn lane and Chancery lane on the east; Holborn and Oxford street form the boundary line between them. South of that line are the squares which, having once been the seats of rank and elegance, have become rather unfashionable. North of it are Russell square and the Bedford and Bloomsbury square dis-

trict, which are now chiefly inhabited by lawyers and merchants. Further E. are Great Ormond, Queen, Brunswick, and Mecklenburg squares, where lodging houses abound. North of this range are Regent, Torrington, Woburn, Gordon, Tavistock, and Euston squares. Soho square, near Oxford street, was one of the gayest in the days of George III. and of the prince regent (afterward George IV.), and is to be embellished like Leicester square. The latter has become in the present century the haunt of foreigners, and was disfigured by unseemly sights and exhibitions; but in 1874 a beautiful garden laid out in it by Baron Grant was thrown open to the public, and there is a movement in favor of admitting



Albert Memorial Monument.

the people to the gardens in all the squares. Seventy-one new squares were formed in the police area between 1849 and 1873.—The public parks are among the greatest attractions of London, and have been justly called its lungs. (See PARK.) Hyde park (area about 400 acres), connecting the Green park with Kensington gardens, with a fine sheet of water called the Serpentine, is a fashionable resort belonging to the crown, and is indebted for its beauty to William III. and Queen Caroline. The bridle road from Apsley house to Kensington gardens, known as Rotten Row, a corruption of the French *route du roi* ("king's drive"), is thronged with brilliant cavalcades during the season. The present greatest artis-

tic feature of Hyde park, and the most splendid monument of modern times, is the new Albert memorial, erected on the site of the crystal palace of 1851, in honor of the services of Prince Albert. At the corners are marble groups of Asia, America, Europe, and Africa. Reliefs and frescoes rising up to the winged angels at the top and on the east and south fronts contain 169 life-size portrait figures of illustrious artists, poets, and composers. The central space under the grand canopy is occupied by the seated figure of Prince Albert. This great work of genius, together with the equally famous Albert Hall opposite, and the adjoining South Kensington museum buildings, throw over this part of London an exquisite halo of æsthetic grace and beauty. Regent's park (450 acres) is nearly circular and surrounded by mansions of the larger class built in uniform terraces, producing a fine effect. The zoölogical and botanic gardens, which are in this park, are among its principal attractions. St. James's park (59 acres) resembles in its shape a boy's kite; the head is bordered by the Horse Guards in the centre, the admiralty on its right, and the treasury on its left; the tail is occupied by Buckingham palace; the N. side by the Green park, Stafford house, St. James's palace, &c.; and the right or S. side by Queen square and the Wellington barracks. The road connecting this park with Hyde park, and skirting the garden wall of Buckingham palace, is called Constitution hill. Green park (60 acres), next to Hyde park, is entered from Piccadilly by a triumphal arch, surmounted by an equestrian statue of Wellington, and situated between that street and St. James's park, Constitution hill, and the houses of Arlington street and St. James's place. The available space of this park was extended in 1856 by the removal of the reservoir of the Chelsea water works. It is one of the smallest and prettiest parks of London. Alexandra park, N. of Highgate, a favorite place for horse shows, contains charming grounds, in the midst of which a new palace was fast approaching completion in 1874. Victoria park (300 acres) is a great benefaction for the overcrowded and hard-working inhabitants of Bethnal Green and Spitalfields in the N. E. part of London. On the Surrey side are Kennington park (formerly Kennington common) and Battersea park, which faces Chelsea hospital. Among recent pleasure grounds are Southwark park at Rotherhithe, between Spa road station and the Lower road, Deptford, and divided by Bermondsey from the district of Southwark; Finsbury park, between Hornsey and Holloway; and West Ham park, which was opened in 1874 as a relief to the hard-working people of the district, on the grounds of the Gurney family. Hampstead heath, Tooting common, and Clapham common are to be converted into parks, and a similar project was formed in 1874 in respect to Stoke-Newington Green; while strong efforts are made to save the re-

maining portions of Epping forest from enclosure. Greenwich, Richmond, and Bushy parks are all beautiful resorts. The Kensington gardens, E. of Kensington palace, present a charming variety of surface in wood and water and extensive ground, the general beauty of which is unequalled in any part of the world. They are separated from Hyde park by a bridge over the Serpentine. The Kew botanic gardens are 5 m. from Hyde Park corner, on the road to Richmond, with 170 acres of pleasure grounds adjoining, laid out in half garden, half park style. The Chiswick and S. Kensington gardens (adjoining the museum) are to horticulture what those of Kew are to botany; the former is celebrated for its highly fashionable garden parties. The other principal gardens are the botanic in Regent's park, Surrey, Walworth, Cremorne (Chelsea), North Woolwich, Rosherville (near Gravesend), People's (Willesden), the Temple gardens, and the superb pleasure grounds at Sydenham. Vauxhall gardens were closed in 1859. Among the many attractive places in almost all directions from London are Harrow, Hampstead, Highgate, Blackheath, Greenwich, Woolwich, Blackwall, Gravesend, Richmond, Hampton Court, Epping Forest, Twickenham, Sydenham, and Windsor.—Besides St. Paul's cathedral, Westminster abbey, and three chapels royal (respectively in St. James's palace, Whitehall, and the Savoy), there are about 600 parish and district places of worship belonging to the established church. The chapels of the Wesleyan and other Methodists number about 400, and a recent decision of the Methodist conference (1873) favors the annual erection of a number of chapels, to meet the demands of the increasing population. The Baptists have about 300, and the Congregationalists nearly 150. The Roman Catholics possess 100 churches and chapels, besides St. George's cathedral, Southwark, and the recently opened church of Our Lady of Victory, Newland terrace, Kensington, serving as a pro-cathedral in place of St. Mary's, Moorfields, pending the completion of the projected "metropolitan cathedral" in Westminster. The English and other Presbyterians have about 25. Recently it was proposed to build 40 new Presbyterian churches, to cost not less than £3,000 nor more than £5,000 each. The Unitarians have over 12. The Swedenborgians, who have since Swedenborg's time met in Cross street, Hatton garden, recently purchased a site in Camden road, for the erection of schools and a church as the chief centre of the denomination, and they have several chapels besides. The church of Scotland has a number of chapels, besides the national Scotch church, Little Russell street. The German Lutheran, Reformed Wesleyan, and Reformed have altogether about 12 chapels. The society of Friends have five houses, the Plymouth Brethren three, and there are chapels for Swedish, Swiss, Dutch, French, and other foreign Protestants, and for miscellane-

ous denominations. The Greek merchants sustain a fine church in London Wall, near Finsbury square, and the elegant chapel of the Russian embassy is in Welbeck street, West End. The Jews have over 20 synagogues, and the number is constantly increasing. The "great synagogue," under the chief rabbi, is in Duke's place, in the City, and has had since 1870 a branch in Portland road, West End; the latter is a rich and remarkable structure which cost over £24,000. There are altogether about 1,500 places of worship within the metropolitan limits, and nearly 2,500 including those in the outlying regions. Among the most ancient and interesting churches are the following: St. Bartholomew the Great, West Smithfield, dating from 1102, was restored 1865-7. Opposite St. Bartholomew's gate is the site of the stake where the victims of intolerance perished during the reign of Queen Mary. St. Saviour's, Southwark, became a parish church under Henry VIII., and ranked next to Westminster abbey for its specimens of early English; but nothing remains of the ancient edifice excepting the choir and the Lady chapel, the restored building being of an inferior kind. It contains a monument of Gower, who founded a chantry and is buried here, as were Edmund, the youngest brother of Shakespeare, Lawrence Fletcher, one of Shakespeare's associates, John Fletcher, Beaumont's associate, and Massinger. The Temple church, near Temple Bar, consists of the Round church and the choir, and was the place of worship of the knights templars. The choir is reserved for the students and benchers. The learned Selden is commemorated by a marble monument, and he and Oliver Goldsmith are buried here. St. Giles's, Cripplegate, one of the oldest churches, is the burial place of Milton, in whose honor it was restored in 1864. The 14 bells of the tower are celebrated for their chimes, which are played every three hours. St. Mary-le-Savoy, down the Savoy steps between the Strand and the river, one of the chapels royal, is used as a district church; it was built under Henry VII. on the site of the palace of Savoy, originally erected for Peter, count of Savoy, uncle to Queen Eleanor, wife of Henry III.; it contains monuments and tombs of eminent persons. It was partly burned in 1864, rebuilt in 1865, and temporarily closed in 1874, pending its restoration. St. Paul's, Covent Garden, built by Inigo Jones, was burned in 1795, and subsequently restored by the architect Hardwick. Lady Mary Wortley Montagu was baptized, and Samuel Butler, the author of "Hudibras," was buried here. St. Mary-le-Bow, Cheapside, popularly known as "Bow church," has a modern steeple, 235 ft. high, which is one of Wren's masterpieces. The far-reaching sounds of the bells led to the saying of "children born within the sound of Bow bells." The register of Milton's baptism and other relics will be removed to this church in the event of the proposed demolition

of All Hallows, Bread street, known as John Milton's church. St. Bride's or St. Bridget's, Fleet street, another of Wren's most celebrated achievements, has a fine steeple and elegant interior. The novelist Richardson is buried here. St. Stephen's, Walbrook, in the rear of the mansion house, is another monument of Wren's genius, especially the interior. It has a circular dome on an octagonal base resting on eight pillars. St. Magnus, London bridge, and St. James's, Piccadilly (one of the most fashionable churches), by the same architect, are likewise much admired, and especially the latter, which has an airy, elegant, and extensive interior, comfortably accommodating 2,000 persons. The beautiful marble font is the work of Grinling Gibbon. St. Martin's-in-the-Fields (near Trafalgar square), built by Gibbs, is mainly remarkable for its fine portico. St. George's, Hanover square, the most fashionable church for marriages in London, was built by John James as one of 50 new churches in the early half of the 18th century. The duke of Wellington attended this church, and was constantly in requisition for giving away brides. St. Stephen's, Rochester row, near Tothill Fields (Westminster), dating from 1849, is a fine specimen of modern Gothic architecture. Whitefield's chapel, near Tottenham Court road, built in 1756 under his auspices, is the place where he first preached to a large indoor congregation, and where his wife is buried. The cathedral-like "Apostolic church" (Irvingite) is in Gordon square. Spurgeon's mammoth tabernacle is near the Elephant and Castle tavern; and a new tabernacle in Burdett road, Stepney, is a sort of foster child of the former, and calculated to accommodate 4,000 persons. The ritualistic All Saints' church, Margaret street, Regent street, is a masterpiece of modern mediævalism, of which Dr. Pusey laid the foundation stone in 1850, and which was consecrated in 1859; it cost £100,000, of which the architect Butterfield contributed £60,000, a banker gave £30,000, and Mr. Beresford Hope £10,000; and the marquis of Sligo presented the marble font and baptistery. Rowland Hill's or Surrey chapel, Blackfriars road, was opened in 1783, and the Rev. Mr. Hill, one of Whitefield's followers, was its first pastor for 50 years. The present incumbent, the Rev. Newman Hall, had the foundation stone of Christ church, Lambeth, laid June 26, 1873, for the removal of his congregation. The old and popular brick parish church of Kensington, where Macaulay had a pew while residing at Holly lodge, was pulled down in 1874 to make room for a new and elegant building by the architect G. G. Scott, in the "late first pointed style," with a lofty spire. Among the noteworthy new churches are the cruciform Smithfield martyrs' memorial church, St. John street, West Smithfield, with a tower 120 ft. high, and sculptured reliefs in commemoration of the martyrs of Smithfield during the persecutions under Mary; St. Phil-

ip's, Queen's road, Battersea park; St. Peter's, Harrow road; and St. Columba's, Kingsland road, the largest and finest of the many new brick churches. St. Stephen's, S. Hampstead, is rather a picturesque building, and St. Jude's, S. Kensington, accommodates 1,600 persons. St. Saviour's, for the deaf and dumb, at the corner of Queen street, Oxford street (opened in 1873), is smaller, but of striking appearance, being of red brick and stone, a Maltese cross in plan, an octagon above, and with groined ceiling and a tall roof. St. Luke's, Redcliffe square, S. Kensington, will accommodate over 1,000 persons; and St. Patrick's, Cromwell road, is a spacious Romanesque edifice, completed in 1874. The architecture of the Congregationalists ranks next to that of the established church, and among their new churches in course of completion (1874) are the "Memorial hall," Farringdon street; the "City temple," near St. Andrew's church, Holborn; and Christ church, Westminster bridge road. The state-ly new Marylebone Presbyterian church was opened in 1874. Among the conspicuous new chapels of the Wesleyan Methodists, one of the largest is near Highgate hill, and one of the most ornamental is Barry road chapel, Peckham rise. Other recent places of worship are St. Agnes, Kennington park, and All Hallows, near Bow station, the latter the first of three new churches to be erected from the proceeds of the site of All Hallows, Mark lane. The reconstruction of the well known Hampstead church was proposed in 1874, and the same year witnessed, along with many other demolitions, that of St. James's, Duke's place; the bodies buried there were removed to Ilford cemetery, and its monuments to St. Catharine Cree, Leadenhall street, to which church the parish of St. James is now affiliated.—But however great the variety and the interest of the many churches of London, they are all eclipsed by St. Paul's cathedral and Westminster abbey. The former stands on the site of old St. Paul's, the origin of which is traced back to the beginning of the 7th century, and which was destroyed by the

great fire of 1666. The present cathedral was completed in 1710. (See CATHEDRAL.) Among its monuments are those of Nelson, John Howard, Dr. Johnson, and Sir Charles Napier. In the crypt are the tombs of Nelson and Wellington. The great memorial in honor of the latter is in course of completion (1874). Reynolds, Turner, and other illustrious painters, and many eminent persons, are also buried here. Under the dome is the "whispering gallery," communicating with the stone gallery on the outside of the dome, whence the outer golden gallery at the apex is reached, which affords a noble view of the metropolis and its vicinity.



St. Paul's Cathedral.

The whole ascent is by 616 steps, of which the first 260 are comparatively easy and well lighted. In the S. W. tower are the clock room and the great bell, the diameter of which is about 10 ft. The restoration of St. Paul's after Wren's original designs for the internal decoration has been projected for several years past; the fund for that purpose was raised to £60,000 by contributions on occasion of the national thanksgiving for the recovery of the prince of Wales in 1872, when an imposing ceremony of thanksgiving on the part of the queen and the prince took place here (Feb. 17). Many improvements have already been made, and others are in progress. The annual singing of 5,000 me-

metropolitan charity children on the first Thursday in June was characterized by Haydn as the most powerful effect he ever experienced from music. Divine service is performed in the chapel thrice every day: at 8 and at 9.45 A. M., and at about 4 P. M.; and since 1859 there has also been an evening service on Sundays under the dome, with seats for 3,000 persons. St. Paul's is the cathedral church of the see of London. Its administration is under the charge of a dean and chapter, consisting of four resident canons, four prebendaries, and various minor officers. Westminster abbey existed before the end of the 8th century, and is traced to the early part of the 7th. The larger portion of it in its present condition was completed in the middle of the 13th. It is in the form of a somewhat irregular cross. Its length, exclusive of Henry VII.'s chapel, is 511 ft.; ex-

the shrine of Edward the Confessor, formerly richly inlaid with mosaic work. Henry VII.'s chapel is a fine specimen of the architecture of the time of that monarch, who founded it. The monuments of Queen Elizabeth and Mary Stuart are in the N. and S. aisles of the chapel respectively. In the S. transept, in and near Poets' corner, are monuments to most of the great poets of the country; and here, as well as in both aisles of the nave and choir, are monuments of other illustrious Englishmen. Among those buried there most recently are Macaulay, Dickens, Bulwer, and Livingstone. Religious service is performed daily in the abbey, and the services on Sunday are numerously attended, though the voice of the preacher is not generally audible. Westminster abbey is officially called the collegiate church of St. Peter's, Westminster, and is governed



Westminster Abbey.

treme breadth at the transept, 203 ft.; height of the nave 102, and of the towers 225 ft. Soon after the revolution the abbey, which had suffered much during the civil wars, was repaired, and the western towers were added by Wren, but in a mixed Grecian and Gothic style which occasioned much criticism. On approaching Victoria street from Parliament street, the buttresses and pinnacles and the whole expanse of the abbey gradually open to view. The British sovereigns, from Edward the Confessor to Queen Victoria, have been crowned in Westminster abbey, and many of them are buried there, some with, others without monuments. Surrounding the E. end in a semicircle are nine chapels, the most interesting of which are those of Edward the Confessor, beyond the altar, and of Henry VII., which forms the eastern extremity of the abbey. The centre of the former chapel is occupied by

by a dean and chapter of eight prebendaries, and other officers. The cathedral windows have been lately provided with painted glass, but not with sufficient effect to encourage similar embellishments for the chapter house, which latter was completely restored in 1872. The most interesting among the various works relating to religious edifices is the "History of the three Cathedrals dedicated to St. Paul in London," by William Long-

man (London, 1873).—Most celebrated among the many religious associations of London is the British and foreign Bible society, with thousands of branches all over the United Kingdom, the British colonies, and in other parts of the world; its annual circulation of volumes is about 4,000,000, and it distributes the Scriptures in 200 foreign languages. Since 1868 it has occupied an extensive building in the street leading from the mansion house to Blackfriars bridge. (See BIBLE SOCIETIES.)—The total number of persons relieved in the second week of August, 1874, in connection with workhouses and almshouses, was 33,274 indoor paupers and children, 34,389 outdoor paupers, and 24,026 under 16; total, 91,689, against 118,803 in 1871, 101,630 in 1872, and 97,984 in 1873, the relative decline being much greater in view of the increased population. Conspicuous among other public



dispensers of relief is the society for the suppression of mendicity, established in 1818, reconstructed on a larger scale in 1869 under the title of "The Society for organizing Charitable Relief and repressing Mendicity," having offices close to the poor-law relieving offices throughout the metropolis, with the design of compelling the poor-law officers to do their duty. A committee in each parish or district superintends the operations, which are carried out through a special charity agent in conjunction with the relieving officers, the local charities, the police, the clergy, and the district visitors. Tickets are supplied to beggars, and on their presentation they get food and also work. Confirmed beggars and vagrants are sent to the poor-law guardians or legally prosecuted. The chief aim of the society is to procure work, to extirpate professional mendicity, and to detect and expose begging-letter impostors. Prominent among similar district associations of the kind, pledging themselves to seek out the sick and afflicted, and to supply visitors in parishes where the ordinary residents are unable to meet the wants of the population, are the metropolitan visiting and relief association (formed in 1843), and the society for the relief of distress and to furnish work for the poor (1860). A powerful impulse has been given to London charities in the present generation by the writings of Charles Dickens and his followers, the munificence of Lady Burdett-Coutts, the care of Florence Nightingale for the sick and wounded, George Peabody's donations for improved dwellings for the poor working classes, and the influence of the queen and other members of the royal family. The total number of charitable institutions is over 1,000. Their united income has been computed at about £5,000,000, half of which is given in the shape of food and clothing, and the rest for the relief of the infirm and for the promotion of general improvement. Alms and other relief afforded by private individuals raise the total amount spent on charities to nearly £6,000,000, of which nearly one third is provided by poor rates, and the rest chiefly by bequests, donations, and voluntary contributions.—The principal general hospitals are St. Bartholomew's, Smithfield (present structures opened in 1547), Westminster (1719), Guy's (1721), St. George's (1733), London (1740), Charing Cross (1818), Royal free (1828), North London or University (1833), Metropolitan free (1836), Middlesex (1836), King's College (1839), St. Mary's (1851), Great Northern (1856), West London (1856), and the new St. Thomas's (1871). St. Bartholomew's, Smithfield, occupies the site of a priory which was founded in 1102. Subsequently the hospital was enlarged, and now contains about 600 beds and affords relief to over 70,000 patients annually. Its income is about £40,000 a year. Connected with it are a school of medicine and many medical and surgical museums. Among its celebrated teachers and lecturers was Harvey, and its

most munificent benefactor was Dr. Radcliffe, physician to Queen Anne, who bequeathed to it a perpetual annuity of £500 for improving the hospital diet, and £100 for the purchase of linen. Guy's hospital, near London bridge, was endowed by Thomas Guy, a bookseller, and its chapel contains the tomb of the celebrated surgeon Sir Astley Cooper. It treats annually about 80,000 patients, and the number of inmates is usually about 500, but occasionally much larger. The lectures and practice attract many medical students. St. Thomas's hospital originated from an almshouse established in 1213. It was connected with a hospital in 1552, restored in 1706, and removed to High street, Southwark. It now has 44 wards, with accommodation for about 500 patients, the total number of indoor and outdoor patients being 50,000 annually. The income is £32,000. The Southeastern railway bought the building and its grounds in 1862 for £296,000, for the use of their London bridge terminus extension to Charing Cross. It was rebuilt between 1868 and 1871 on ground gained from the river on the right bank of the Thames, between Lambeth palace and Westminster bridge. It consists of seven detached blocks of red brick buildings, four stories high, 125 ft. apart, and raised on lofty foundations, and occupies a large area of the new Thames embankment. Connected with Guy's and some of the other hospitals are lying-in asylums. Among other general institutions of the kind are the French hospice, originally founded for the relief of Huguenot refugees, and removed in 1866 from its old site, Old street, St. Luke's, to Victoria park, S. Hackney, and rebuilt in the style of a French château; the German hospital, Dalston, annually relieving about 20,000 Germans; and the seamen's hospital ship Dreadnought, moored in the river off Greenwich. (For the celebrated Chelsea naval and Greenwich military hospitals, see CHELSEA, and GREENWICH.) Among special hospitals are those for smallpox in Upper Holloway, for consumption in Brompton and other localities, for cancer in Brompton, and for diseases of the eye in Finsbury and Charing Cross; the royal orthopedic institution in Oxford street; the national hospital for the paralyzed and epileptic in Whitechapel; Lock hospital, chapel, and asylum, Westbourne Green, for the cure of female diseases and for the redemption of abandoned women; Magdalen hospital, for which a new building was opened in 1869 in Leigham Court road, Streatham, for penitent prostitutes; St. George's, Hyde Park corner, a general hospital, but in which the lame are specially cared for; and the hospital administered by women for women and children, and intended in 1874 for removal to Marylebone road. There are altogether nearly 100 distinct organizations of hospitals, infirmaries, and surgical societies for special objects, and for attending to all classes of diseases, besides the soldiers' hospital at Woolwich, the

Jewish hospitals, and the establishments under the control of homœopaths and mesmerists; and there is also a galvanic institution. There are five institutions for confirmed invalids, of which the most important are the royal hospital at Putney heath, founded in 1850, with 150 inmates, and contributing £20 a year each for the outdoor relief of about 300 other incurables; and the British home, founded in 1861, with 100 inmates, and giving pensions in 150 cases. In 1872 initial measures were taken for the establishment of a national hospital for London incurables, to be erected in Oxfordshire. Private asylums for confirmed female invalids are in Great Ormond street (Miss Twining's institution), and at Mount Greville, Kilburn. Of asylums and almshouses for the aged there are over 120, mostly of remote foundation, some as early as the 15th century, and the majority in existence at the end of the 18th century. Exclusive of a few asylums for members of certain trades and for widows of soldiers, there are hardly any of recent foundation excepting the royal dramatic college and Honor's home, both founded in 1859, and Dr. Rippon's, in 1866. Prominent institutions of this kind are the London almshouses at Brixton and the licensed victuallers' asylum. Among other institutions are those for the blind, St. George's-in-the-Fields, Surrey, and in Avenue road, St. John's Wood; the asylum for deaf and dumb children, Old Kent road, Surrey; and the Alexandra institute, Oxford street, founded in 1863. There are altogether 23 institutions for the blind in London, and 5 leading ones for the deaf and dumb. Florence Nightingale having declined to receive £50,000 collected for her in reward of her services in the Crimea, except on the condition that the money should be appropriated to the establishment of a training school for nurses, such an institution was founded in connection with St. Thomas's hospital, where about 25 women are maintained and instructed previously to serving in hospitals and infirmaries. Similar institutions are supported by the establishment, such as the "Nursing Sisters," Devonshire square, Bishopsgate (opened in 1840), with 100 inmates dressed in a peculiar costume. The London diocesan deaconesses' institution (founded in 1861) devotes itself mainly to nursing, but also to other benevolent purposes, after the model of the Roman Catholic sisters of charity. The multiplicity of hospitals for children is especially remarkable. The Evelina hospital was founded in 1869 on the Southwark bridge road by Baron Ferdinand de Rothschild in memory of his wife, after whom it is called, and other similar institutions have arisen within the last few years. There were in 1874 about 60 dispensaries strictly limited to residents, relieving over 60,000 out patients, and they are increasing in every part of the metropolitan districts. There are nearly 50 convalescent homes, affording relief to the hard-working classes of the overcrowded lo-

calities, where the impure atmosphere or inadequate water supply and imperfect drainage would render their recovery from illness almost impossible. Many new convalescent hospitals are completed or in course of erection. There are nearly 160 benevolent and provident funds and pension societies, supported by various trades and professions; and there are many other associations of the same kind. The so-called "patriotic funds" are devoted to soldiers; the principal one, managed by a royal commission for relieving the widows and orphans of Crimean soldiers, received over £1,000,000 of contributions in 1854, half of which had been spent in 1868. The Victoria asylum at Wandsworth was established in 1859 for the maintenance and education of 300 orphan daughters of soldiers and sailors. The Indian mutiny fund's accounts on Dec. 31, 1871, showed that £250,000 had been disbursed, and the total sum raised during the mutiny was £440,000. The Franco-German war of 1870-'71 called into life many organizations for the relief of the sufferers among the respective nationalities. The British national society for aid to the sick and wounded is the most wealthy institution of the kind, and there are more than 10 others for soldiers and their children, and about 25 for sailors and their families. There are nearly 50 orphanages and asylums for fatherless children. The most recent are the metropolitan police and the Stockwell orphanages, the latter under Mr. Spurgeon's direction. The adult orphan institution trains the daughters of clergymen and naval and military men for governesses. There are eight principal shoe-black societies, founded from 1851 to 1869, which in 1870 employed 368 boys, who earned £10,197, and saved £874. They are chosen according to merit from the ragged school union. The best known lunatic asylum, the name of which has often been generally applied to establishments for the insane, is Bedlam, or more properly Bethlehem hospital. (See BEDLAM.) The patients are here treated with great skill and kindness; the women are supplied with pianos and the men with billiards and other amusements. A few cells are lined and floored with India rubber and cork, against which the most insane person may fling himself without possibility of injury. It accommodates about 600 persons. Two remote wings are reserved for the most unmanageable patients. Within a distance of 6 to 8 m. from London are the Colney Hatch asylum, covering 120 acres on the Great Northern railway, and Hanwell asylum, on the Great Western railway. A large lunatic asylum for middle-class patients was established in 1874 by Thomas Holloway on St. Anne's heath, near the Wokingham branch of the London and Southwestern railway; and the same philanthropist proposes to found two additional asylums in the vicinity of the metropolis, one for imbeciles. The most recent miscellaneous institutions comprise a parochial

infirmary at Camberwell; the poor clergy relief corporation, Southampton street, Strand; the Princess Mary's village at Addlestone, Surrey, so called after its patroness the princess Mary of Cambridge, Duchess Teck, for the benefit of children of convicted criminals; the cripples' home, Marylebone road; the royal association of the deaf and dumb, which however is only a new name for the comparatively old establishment of St. Saviour's, Oxford street; and the clergy orphan corporation. Of homes and reformatories there are in round numbers 70, besides the "house of charity," Soho, and similar institutions, which supply a night's lodging and food free of expense, actual want being the only condition of admission. An increasing number of infant nurseries, popularly known under the French name of *crèches*, take care of children while their mothers are engaged in their daily labors.—The principal foundling hospital, Guilford street, opened in 1756, founded chiefly by Capt. Coram and much patronized by Handel the composer, was originally mainly educational. Soon afterward it became a home for illegitimate children, and now maintains 500 of them at an annual expense of £14,000. The infant orphan asylum at Wanstead, near London, founded in 1827, maintains orphaned and abandoned children till their 14th or 15th year. (See **FOUNDLING HOSPITAL**.)—The "Metropolitan Association for improving the Dwellings of the Industrious Classes" and the "Society for improving the Condition of the Laboring Classes" were the pioneers of the movement for the object indicated by their names. The first named association was established about 1844 by Dr. Southwood Smith and others, and after many trials it lately reached a dividend of 5 per cent., derived from the rents of about 800 tenements, with an average population of nearly 4,000, and with a mortality from 6 to 10 per cent. below that of crowded metropolitan districts. The least remunerative lodgings were those provided for single men, and the most profitable those occupied by families. The second named organization was originally termed the "Laborer's Friend Society," and has been in operation since 1843. It has converted Wild court, one of the worst purlieus of Drury lane, into a decent locality; and it has promoted various similar improvements. It possesses a number of model dwellings for families and single men, to whom it lets houses and rooms at moderate rates, and is assisted by donations and voluntary contributions. The "Improved Industrial Dwellings Company," originated in 1863, under the auspices of Alderman (afterward Lord Mayor) Waterlow and others, has a share capital of £125,000 fully subscribed, and a borrowed capital of equal amount. It has erected over 2,000 tenements in some of the most densely populated districts. The average weekly rental of a room is 2s. 6d., and of dwellings for superior classes of artisans near the city, with three

rooms each, 7s. Those in Ebury street, on the duke of Westminster's estate near Eaton and Belgrave squares, are of a superior style, and relieve the overcrowded and numerous mews in the rear of those fashionable squares, chiefly inhabited by butlers, footmen, coachmen, and other persons employed in those localities. Lady Burdett-Coutts's improved dwellings in Columbia square (dating from 1862), consisting of four immense blocks of tenements, for the first time familiarized the workmen of Bethnal Green with a certain degree of comfort. George Peabody's first gift of £150,000 provided for about 500 tenements, with space for 2,000 persons, in four groups of dwellings in Spitalfields, Islington, Westminster, and Shadwell, besides 70 tenements in Chelsea and Bermondsey. His additional donations bring up his total contributions to £500,000, and cover the cost of new buildings in Brixton, Chelsea, and other localities, as well as the grounds on the extensive Magdalen hospital estate, Southwark, now known as Peabody square. The Peabody dwellings accommodated, as far as completed down to 1874, 6,000 persons, at the average weekly rent of 1s. 10d. per room. The first estate built by the "Artisans', Laborers', and General Dwellings Company" (established in 1866) is called Shaftesbury park, in honor of Lord Shaftesbury, the earliest promoter of such enterprises. The City corporation and several other new societies have also engaged in erecting dwellings of this class.—Education is rapidly improving under the endowed schools act of 1869 (subsequently amended and enlarged), dealing with schools for the upper and middle classes, and placing them on a more popular and useful basis; and under the elementary education act of 1870, organizing hundreds of new establishments through the medium of already existing or projected voluntary institutions, but mainly through the foundation of rate-supported schools under the direction of public school boards. (See **EDUCATION**.) The latter act divides the metropolis into 10 school districts, represented in the central school board of 49 members, elected by ballot, as follows: Marylebone, 7; Finsbury, 6; Westminster, Lambeth, Tower Hamlets, and Hackney, each 5; the City, Southwark, Chelsea, and Greenwich, each 4. The first election, Nov. 29, 1870, returned Prof. Huxley and other eminent men, and Dr. Elizabeth Garret-Anderson, and the board comprised three Roman Catholics, one Baptist clergyman, and members of other denominations, the largest number however belonging to the established church. The district boards in 1874 included about 300 members, and the number augments in proportion to the increase of population and the need of new schools. The school funds are raised in about equal proportions from parents, public taxes, and local funds, the latter consisting of voluntary subscriptions; and deficiencies are met by an educational rate added to the poor rate of a

maximum not exceeding 3*l.* in the pound, or by extra parliamentary grants. The charges to parents are remitted in well attested cases of pecuniary disability. The school boards have the power of either providing new schools or assisting those already established, provided the latter are in good condition and adopt the requisite conscience clause establishing the widest religious liberty and banishing sectarian differences. They are authorized to compel the attendance of children between the ages of 5 and 12. As lately as 1869-'70 there were 30,000 children out of 40,000 within the space of a square mile in the East End growing up in complete ignorance; and of 45,000 children in the ragged schools in 1870, only 900 attended for a whole year. The education act of 1870 defines the school age between 3 and 13, and includes both sexes, though they are instructed separately. The number of children of school age within the districts was estimated in 1874 at 782,000. Besides hundreds of schools under the direction of the district boards, London contains a vast number of other district, parochial, ward, national, industrial, and charitable public schools, besides about 50 exclusively for Roman Catholics, and over 600 private schools of various grades for boys and girls.—The university of London confers degrees on the pupils of all the proprietary collegiate institutions of England. (See COLLEGES.) Its new buildings were opened May 11, 1870. University college, Gower street (originally London university), opened in 1828 for persons of all religious denominations, was attended in 1873-'4 by 1,542 pupils (893 in the college and 649 in the school). A new wing was added to it in 1873. King's college, Somerset house, opened in 1831, is a similar institution, except that divinity is taught there under the auspices of the established church. The school connected with the college was attended in 1873-'4 by 521 students, against 456 in 1872-'3, and the evening classes in the former year by 550. The royal commissioners' report for 1874 recommends to King's college to apply for a new charter, cancelling the moderate proprietary rights of its shareholders, and abolishing all religious restrictions on the selection of professors; and it is hinted that any aid from government will be conditional on such a reconstruction of the college as will effect these objects. Measures for its enlargement were instituted in 1874. The college for Independents possesses a faculty of theology and a faculty of arts. St. Paul's school, founded in 1509, where Milton was educated, was rebuilt in its present form in 1823. The new Roman Catholic college in Kensington was opened Oct. 15, 1874. Among the other noteworthy educational institutions are St. Peter's college, or Westminster school, where Ben Jonson, Dryden, Locke, and Gibbon received their education; the Charterhouse school, removed in 1874 to the hilly region of Godalming, a new chapel being in course of construction; the school called

Christ's hospital (see CHRIST'S HOSPITAL); and Merchant Taylors' school, founded in 1571, supported by that company, and instructing 260 boys at an annual rate of £10. The City of London school for the respectable middle classes was established in 1835. A government school of design or department of practical art dates from 1837, and the new female school of art has 200 pupils. The Wesleyan normal college, Westminster, was established in 1850; and there is another normal school at Fulham. Medical and surgical schools are attached to the great hospitals, and there are several distinct colleges for these and other sciences, including among other new institutions one for civil engineers, and the Indian civil engineering college, Cooper's hill, instituted in 1871. The royal school of naval architecture and marine engineering was opened in 1864, and closed at the end of April, 1873, owing to the establishment of the royal naval college at Greenwich. The college of physicians in Pall Mall and that of surgeons in Lincoln's Inn Fields hold examinations for licenses or diplomas.—Besides many valuable private libraries, there are nearly 50 accessible to the public, that of the British museum being the largest. Among various interesting libraries is the India library, East India house, with 3,000 Sanskrit and 5,000 other volumes of manuscript; and many libraries are connected with colleges, clubs, and various institutions and societies. The new City library was opened in the guildhall in 1873, and one is projected for the mansion house. London is particularly rich in circulating libraries, one of the largest (St. James's square) containing 80,000 volumes. Mechanics' and various other institutes and associations for promoting knowledge are constantly increasing, as well as periodicals and newspapers of every description. (See NEWSPAPERS, and PERIODICALS.)—The palace for the learned societies, in the new Burlington house, which is nearly completed, is to be occupied by the royal, Linnæan, geological, astronomical, and chemical societies. The geographical society has a wide celebrity for its promotion of explorations; and other important institutions are the antiquarian, Asiatic, ethnological, philological, statistical, archæological, microscopical, and zoological societies, the social science association, and the British association for the advancement of science. The last two have annual sessions in different cities. The royal society, incorporated in 1663, is among the oldest and most distinguished on account of its connection with Newton, Herschel, Sir Humphry Davy, and other illustrious men, whose portraits adorn its rooms, together with interesting scientific relics. It consists of about 800 fellows, and awards periodically to essays or discoveries of the highest merit in various branches of science two royal medals, a gold medal founded by Count Rumford, and another by Copley, which last was characterized by Davy as the ancient "olive crown of the royal

society." The society removed in 1856 from the Somerset to the Burlington house. This society must not be confounded with the royal institution of Great Britain in Albemarle street, comprising a library, reading and lecture rooms, and chairs of chemistry and other sciences. It was founded in 1800 through the influence of Sir Joseph Banks, and Count Rumford was its earliest promoter. The weekly courses of lectures throughout the season, on chemical science, philosophy, physiology, and other departments of science, literature, and art, have powerfully promoted the progress of knowledge; and eminent persons deliver popular lectures on Friday evenings, to which non-subscribers are admitted upon tickets signed by members. Members are elected by ballot, and a two-thirds majority is required for admission. Sir Humphry Davy made here some of his great discoveries, by the aid of the extensive galvanic apparatus of the establishment. Its renown in the present century was brilliantly sustained and increased by Faraday, and its master spirit at the present time is Prof. Tyndall.—The British museum, with its reading rooms, library, and art treasures, has a worldwide reputation. (See BRITISH MUSEUM.) The South Kensington museum in Brompton, a mile from Hyde park corner, was projected in 1852 by Prince Albert, and built upon a site purchased with the surplus fund of the exhibition of 1851, as a national museum of art, and of manufactures allied to art. It was finished in 1858; a new museum for mediæval and modern art and for a depository of articles loaned for exhibition was added in 1869, the latter filling two large glazed courts and other divisions; and two architectural courts were opened in 1873. The museum contains schools of art (a branch of the government department of science and art), of music, and other branches of knowledge, and magnificent collections of oriental and naval articles, of armor, regalia, and relics, of porcelain and enamels, and of a great diversity of skilful and ingenious fabrics, which are all grouped in separate courts, galleries, and cloisters. The picture galleries include the Vernon and Sheepshanks collections of British works of art, which belong to the national gallery, the cartoons of Raphael formerly at Hampton court, the renowned Dutch and Flemish pictures belonging to Mrs. Hope, and other fine paintings. The compartment of sculptures and antiquities contains Italian and other masterpieces, wood carvings, majolica, ivories, &c.; and there are many displays of metallic and various other works interesting to manufacturers. A temporary museum of patents is filled with machines and models, and contains the portraits of distinguished inventors. The art library has over 30,000 works, including many richly illustrated; and there are reading and dining rooms and many other conveniences in the buildings. The number of visitors from the opening down to September, 1874, was over 3,000,000. Admission is free

half the week, and the price on other days is only 6*d.* This museum is the most important nucleus in England for the diffusion of varied information in relation to art, science, manufactures, and almost every kind of tasteful and skilful handicraft. No less than 180,000 works were sent to it for competition at the examination of 1874 from the various schools of art in the country. Adjoining the museum is the Royal Albert hall or South Kensington amphitheatre, opened March 29, 1871. It is devoted to exhibitions of industry and art and to music, and with its beautiful oval form and external frieze and cornice, modelled after the Elgin marbles, it is at the present day the most magnificent palace of art in the world. Opposite to it are the new and interesting gardens of the horticultural society. All around the museums are groups of new buildings for schools of science, and the number of institutions connected with them is increasing not only in this vicinity but in remoter rural districts. The East Indian museum, India office, is remarkable for its collections relating to the arts, manufactures, armor, and natural productions of India, and for its antiquities and historical relics. The United Service museum, Whitehall, is a repository of objects of art and science and of books relating to the army and navy, of the arctic relics of Sir John Franklin, and of military and naval trophies; and lectures are given in it. The royal school of mines and museum of practical geology, in Jernyn street, dates from 1835, and a new and handsome building was opened in 1851. Lectures are delivered here to working men illustrative of the extensive mineralogical collections. The museum of the society of antiquaries, Somerset house, and the new museum, guildhall, contain interesting antiquarian collections. A natural history museum is in course of construction after the designs of the architect Waterhouse, on the site of the old exhibition building of 1862, to be completed in 1876, and to consist of a great central hall 170 ft. long and 97 ft. wide, and of various galleries and other divisions. The principal front of the edifice is to be constructed of terra cotta and 675 ft. long. A lofty tower and other ornaments have been abandoned to reduce the cost from £500,000 to £350,000. The Soane museum, Lincoln's Inn Fields, was built in 1812 under the direction of Sir John Soane, and contains 24 rooms, with Egyptological collections and many remarkable relics, and Hogarth's "Rake's Progress" and other celebrated works of art. The new museum in Bethnal Green is numerously attended by the working classes. Prominent among the institutes is that for architects. The polytechnic institution is a favorite resort for popular scientific entertainments and instruction, and contains collections of machinery and models and lecture rooms, which are open daily.—The national gallery of paintings of all schools, Trafalgar square, was comple-



ted in 1838 from the designs of Wilkins, at a cost of nearly £100,000; and the erection of new rooms on the site of the old workhouse, at the rear of the present gallery, is in progress. It originated with the Angerstein collection of 38 pictures, and contains now over 800, part of which are exhibited in South Kensington for want of room here. It contains 11 rooms for the various schools of art, the 9th and 10th rooms being devoted to Turner's works, and the 11th to the select productions of the most renowned British masters. The national portrait gallery, provisionally established by Lord Stanhope in Great George street in 1858, exhibited between 1866 and 1868 about 3,000 portraits. In 1870 a new gallery was opened for it in connection with the national gallery, Trafalgar square. The total number of portraits owned by the gallery, including paintings, medallions, and sculptures, is over 300. The royal academy of arts was removed in 1868-'9 from Trafalgar square to Burlington house, in which are the schools of art, and in the rear of which are 13 halls for the annual exhibition of works of modern artists in painting and sculpture. This academy was instituted in 1768, with Sir Joshua Reynolds as first president. Each member on his election presents one of his pictures or statues to the collection, which is consequently always increasing; and it includes masterpieces of Reynolds and Wilkie, and fine originals and copies of some of the great Italian masters. The attic floor added to the royal academy has unfavorably changed the aspect of old Burlington house, which Sir William Chambers regarded as one of the finest pieces of architecture in England, and of which the poet Gay wrote: "Beauty within, without proportion reigns." Other exhibitions are those of the societies of British artists, Suffolk street, Charing Cross, and of painters in water colors, Pall Mall East; the institute of painters in water colors, Pall Mall; the exhibition of French works, Pall Mall and New Bond street; the Dulwich gallery and the collections at Hampton court, Windsor; the crystal palace at Sydenham, &c. The most celebrated private galleries are the duke of Wellington's, Apsley house; the Bath gallery (Lord Ashburton's), Piccadilly; the Bridgewater (earl of Ellesmere's), St. James's; the duke of Bedford's, Belgrave square; Baring's, Upper Grosvenor street; the Devonshire, Piccadilly; the Dorchester (Mr. R. S. Holford's), Park lane; the Grosvenor (duke of Westminster's), Upper Grosvenor street; Holland house; the Lansdowne, Berkeley square; the Montague (duke of Buccleuch's), near Whitehall; Norfolk house, St. James's square; Sir Robert Peel's, Privy Gardens; Lord Overstone's, Carlton Gardens; and Stafford house (duke of Sutherland's), St. James's park. Among the most splendid collections is that of the late marquis of Hertford (who resided in Paris), in Manchester house; Manchester square. This and Holderness house, Park lane

(Earl Vane's), are among the most sumptuous mansions of the West End, with fine works of art and vertu. Chesterfield house, the town house of the earl of Chesterfield, who had let it to the duke of Abercorn, was sold in 1869 to Mr. Maguire for conversion into various buildings. It was remarkable for its libraries, vases, bronzes, and other works of art, few but very select. Northumberland house was likewise celebrated for its masterpieces of art. Among other collections are those of the late Mr. Munro, Hamilton place, Piccadilly, and Barry's gallery at the society of arts, Adelphi, near the Strand.—The monuments of London include, besides the Albert memorial in Hyde park, the finest of them all, the celebrated column on Fish street hill, finished in 1677, after the designs of Wren, in commemoration of the great fire of 1666. It stands near the spot in Pudding lane where it originated, and is known as "the Monument." It consists of a fluted hollow Doric column, 200 ft. high. The top is reached by a staircase of 345 steps, and the urn on the top is 40 ft. high. The bass-relief on the pedestal was carved by the father of Colley Cibber, and the four dragons at the four angles by Edward Pierce. The original Latin inscriptions were prepared by Dr. Gale, dean of York, but those subsequently inserted, denouncing Papists as the authors of the conflagration, were finally removed in 1831 by the City authorities. There are statues of Charles I., by Lesueur, at Charing Cross; James II., by Grinling Gibbons, behind Whitehall; Fox, by Westmacott, Bloomsbury square; Canning, by the same sculptor, near Westminster hall; George III., Cockspur street, and Wellington, Hyde park corner, by Wyatt; Pitt, Hanover square, George IV., Trafalgar square, and Wellington, royal exchange, by Chantrey. Among new statues are those of the queen, Mr. Cobden, and Mr. Peabody (the last by Story), in the royal exchange; Foley's statues of Sidney Herbert, in front of the war office, Pall Mall, and of Hampden and Sir Charles Barry, in Westminster palace; the late earl of Derby and Lord Palmerston, placed in 1874 in Parliament square; Foley's model for the colossal seated statue for the Albert memorial, Hyde park; the equestrian statue of the same prince on the W. approach to the Holborn viaduct; a statue of the queen by Noble in the new St. Thomas's hospital (1874), and various other works in honor of her, of Prince Albert, and many distinguished Englishmen.—A rival to the royal academy of music is springing up in an extensive national training school, near the Albert hall, in connection with the South Kensington institution, and with the training colleges, where the music teachers of primary schools are instructed. Among the principal musical entertainments are the orchestral concerts and Handel celebrations at the crystal palace in Sydenham; the performances of the philharmonic, new philharmonic, and British orchestral societies, and the Exeter hall sacred

harmonic society; the popular concerts and those of the choral society at the Albert hall; at the Alexandra palace, Muswell hill, destroyed by fire June 9, 1873, two weeks after its opening, and subsequently rebuilt on an improved plan; the musical union *matinées* at Willis's rooms; Ella's concerts of the highest order of instrumental music; the popular Monday and Saturday concerts and musical evenings during the season; the orchestral promenade concerts at Covent Garden theatre during autumn, under the direction of M. Rivière, on the plan of Jullien and Mellon of former days, attended by overwhelming audiences; and the private concerts at Hanover square rooms, Almack's, and St. James's hall. The two Italian opera houses were Her Majesty's theatre, or the opera house, in the Haymarket (burnt in 1867 and rebuilt in 1869, but never reopened), intended for 1,800 persons; and Covent Garden theatre, or the royal Italian opera house (burnt in 1856 and rebuilt in 1858), accommodating 2,000. Drury Lane theatre has of late years been used as an Italian opera house, in place of Her Majesty's. These are the most fashionable houses, the boxes and the parquet being filled with the highest classes, and nobody being admitted to the pit and the more expensive seats unless in full dress; but this etiquette does not extend to the cheaper seats in the galleries. English opera and foreign opera Anglicized are given occasionally at the crystal palace, while operas of the lighter sort are performed in English at several of the minor theatres, and in French at the St. James's theatre, but the latter is devoted during the season mainly to dramatic performances. The Lyceum and Alhambra theatres combine comic opera with plays, and the latter with pantomimes and ballets; an *opéra comique* theatre was completed in 1871, and the Philharmonic is also devoted to comic opera and ballet. The principal theatres are the Haymarket, Adelphi (rebuilt in 1858), Princess's, Olympic, Royalty, and Strand; and among new ones are the Prince of Wales's, Gaiety, Globe, Vaudeville, New Belgravia, the Court, and the Criterion (opened in 1874 in connection with a large restaurant). All these are chiefly in the regions around Covent Garden. In other parts of London are the Holborn; Sadler's Wells, St. John's street road, long noted for Shakespearian performances; Shoreditch, rebuilt in 1867 on the site of the old Curtain theatre, where Ben Jonson acted; Victoria, Waterloo road, Lambeth, popularly known as the Vic, with a gallery for 2,000 persons; Surrey, Blackfriars road, rebuilt in 1866; Alexandra, Highbury park; Grecian, City road; New Queen's, Long Acre, originally built in 1850 for Hullah's concerts, and rebuilt as a theatre after the fire of 1860; Pavilion, Whitechapel road; Britannia, Hoxton; New East London, Whitechapel road; and Astley's amphitheatre, Westminster bridge road, thrice burnt between 1794 and 1841, and rebuilt. There are several other theatres, the

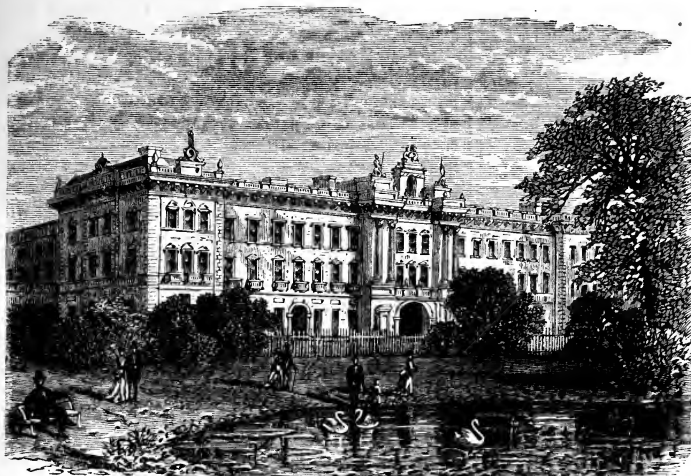
total exceeding 40, and the number changing from the closing of old and establishment of new ones, some having only an ephemeral existence owing to theatrical business being overdone. Madame Tussaud and son's wax works, Baker street, the Egyptian hall, Piccadilly, and other resorts attract numerous persons. There is a gymnastic club in Pall Mall, on the site of the British institution; and a German gymnasium was established in 1866 in Old St. Pancras road, King's Cross, on the system of Jahn, for the use of a private association. Lord's cricket ground, St. John's Wood road, Regent's park, is the principal one of the kind. The most popular periodical amusements are the races, when all London seems to be on the move; the Thames regattas; the shooting matches on Wimbledon common; the military reviews in Hyde park, at the artillery ground near Finsbury square, and at Aldershot; and the national and international exhibitions; while the parks and the rural and riverside regions give boundless opportunities for outdoor recreation. — Few traces remain of the old taverns and coffee houses, which latter were once called penny universities on account of the penny admission fee and of their diffusion of political, literary, and general information. The St. James's coffee house was frequented by Addison and Steele as the headquarters of the whigs. Willis's or Urwin's was, as Macaulay says, "sacred to polite letters." Epicureans who gathered during part of the night in the coffee houses formed convivial clubs, and soon arose the Kit Cat and other famous literary clubs. (See "Club Life of London, with Anecdotes of the Clubs, Coffee Houses, and Taverns of the Metropolis," by John Timbs, 2 vols., London, 1866.) These coffee houses and clubs were the precursors of the large club houses of the present day. White's, founded in 1730, and originally called White's chocolate house, is the oldest and most aristocratic club house, averaging 500 members, who are admitted without regard to political opinions. Brooks's (1764, 600 members) was long the great whig rival of Boodle's renowned toy club. Arthur's dates from 1765, with 600 members. The Guards' club was established in 1813, with nearly 300 members, for the officers of the three regiments of foot guards only. The United Service (1815, 1,600 members), for officers not under the rank of major in the army and commander in the navy, is the most select professional club. Its offshoots are the Junior United Service (1827, 2,000 members), the Army and Navy (1838, 2,300), the Naval and Military (1862, 1,500 members), and the new Junior Naval and Military (1874). The Athenæum (1824), with 1,200 members, is the resort of the learned professions, the highest order of artists and authors, and the upper clergy; and the Junior Athenæum (1864) has 600 members. The conservative Carlton club (1832) has 950 members, and its offshoot the Junior Carlton (1864) has 2,000, exclusive of peers and members of parliament; another offshoot

is the City Carlton (1869), with 400 members. The Conservative (1840) has 1,200 members. The Reform (1834, liberal), with 1,400 members, acquired additional celebrity through its culinary department as organized by Soyer; and a Junior Reform is projected. The Travellers' club (1819), having about 700 members, is frequented by distinguished explorers and scientific and literary men, and is a favorite resort of foreign ambassadors, who alone have free admission to all clubs. The United University (1822) has about 1,100 members; the Oxford and Cambridge (1830), about 1,200; New University (1864), 1,000, half Oxford and half Cambridge men; and the Thatched House or Civil Service (1865), about 700. The Oriental (1824), with 800 members, and the East India United Service (1848), with about 2,000, are the chief centres of the East India service. The Garrick (1831), with about 700 members, and the Junior Garrick (1867), with about 500, are favorite resorts of authors and artists. The Union (1822), with 1,000 members, is frequented by lawyers, merchants, bankers, and gentlemen at large, but is declining under the rivalry of more fashionable clubs. The City of London (1832), with 800 members, and the New City (1862), with 600, are frequented by City men; and the City Liberal (1874), with 1,000 members, now in Queen street, is to be permanently located in Walbrook. Among miscellaneous clubs are the Windham (1828, 650 members), Gresham (1843, 600), Cocoa Tree (1853, 350), National (1845, 500), Whitehall (1865, 800), and Medical (1866, 700). The new St. Stephen's, at the corner of the Thames embankment, for members of parliament, was completed in October, 1874; among other clubs are the Temple, Arundel, and Whitefriars. Purely political clubs exist, such as the Fox and Cobden, and exclusively artistic, like the recently established Burlington fine arts club; and there are various professional and scientific clubs. A new athenæum with lecture rooms and music halls was opened in Camden road in 1873; and in the same year arose in George street, Pimlico, the Grosvenor, the first club ever established for the distinct use of working men. The headquarters of the London swimming club is at the City of London baths. There are several clubs for chess players, who also frequent the cigar divan in the Strand. The Carlton, Reform, Army and Navy, United Service, Athenæum, and Travellers' are the most magnificent of all the club houses. The Army and Navy has externally the most gorgeous, and the Travellers' and United Service the most graceful appearance.—Of the hotels of London, Claridge's (late Mivart's), Brook street, is patronized by royal personages; and the Clarendon, Bond street, is also frequented by persons of the highest rank. Long's, in the latter street, is famous for its wines and for being patronized by sportsmen; St. James's, Piccadilly (Fracatelli's), for elegance and superior cuisine. Maurigy's, Regent street, is much

frequented by the clergy and gentry. The Palace hotel, opposite Buckingham palace, is large and fashionable. Fenton's, St. James's street, and the hotels in Albemarle, Dover, Jermyn, and Cork streets, are more or less frequented by the higher classes. Others in Piccadilly, Cockspur street, Charing Cross, and the Strand are less fashionable and cheaper. The Piazza and other old-fashioned hotels in Covent Garden are noted resorts of connoisseurs of old port and sherry wines. There are also many reputable commercial hotels in the City. Foreign refugees and other aliens abound in the hotels and lodging houses in and around Leicester square. The Westminster Palace hotel, opposite the abbey, is much frequented by railway and business men. The Langham, Portland place, is a favorite resort of Americans. Morley's (Trafalgar square) and other formerly famous hotels have found powerful rivals in new hotels near the railway termini and the new embankments, especially the Charing Cross and Grosvenor. Among the most recent and extensive of these is the St. Pancras, inside the colossal terminus of the Midland railway. Crockford's, once a famous club noted for desperate gambling, was afterward devoted to other purposes, being for a time a dining room; and restaurants abound in all the fashionable and miscellaneous regions of the west, as well as in the Strand and in the City, where some of the taverns and the excellent chop and steak houses enjoy a high reputation, and where Crosby hall, hallowed by interesting memories, has been converted into a dining room. Blackwall and Greenwich hotels are famous for their fish dinners, and the Star and Garter at Richmond is a favorite resort. Lodging houses of all descriptions exist in the cross streets of Regent and Oxford streets and Piccadilly, and all over London, except in the most select quarters of the nobility.—The royal palaces are far less attractive than either the large club houses or the mansions of the nobility mentioned in connection with art treasures, or even those of the principal ambassadors, such as the French, Albert gate, Hyde Park corner; the German, Carlton House terrace, formerly known as Prussia house; the Russian, Chesham house, Belgrave square; and the Austrian, Belgrave square. The queen's town palaces are: Buckingham palace, which she only visits on great occasions; St. James's palace, where receptions are held; and Kensington palace. Her out-of-town residences are at Windsor, at Osborne, Isle of Wight, and at Balmoral, in the Scottish highlands. Buckingham palace was commenced under George IV. and completed under William IV., who however was so displeased with it that he would not live in it. Subsequently it was enlarged and improved; the marble arch was removed to Hyde park, the whole building was converted into a quadrangle by the erection of an eastern front, and the conservatory was converted into a chapel. The

grand staircase is of white marble. The magnificent ball room was completed in 1856, accommodating over 2,000 persons. The throne room is 64 ft. long, hung with striped crimson satin, with coved ceiling, emblazoned with arms, and with a white marble frieze represent-

bishops of Canterbury, primates of England, have had their London residence for many centuries at Lambeth palace (see LAMBETH); and London house, St. James's square, is the residence of the bishops of London and the property of the see.—The houses of parlia-



Buckingham Palace.

ment, or the new palace of Westminster, on the left bank of the Thames and between the river and Westminster abbey, occupy the site of the old palace which was destroyed by fire Oct. 16, 1834. They cover an area of eight acres, and contain 1,100 apartments, 100 staircases, and two miles of corridors. The foundation stone was laid April 27, 1840. The house of lords, 100 ft. long and 45 ft. in width and height, was opened in April, 1847, and is one of the most gorgeous legislative halls in the world. It contains the throne

ing the wars of the roses. The picture gallery, chiefly formed by George IV., includes now Sir Thomas Baring's Dutch and Flemish collection and other first-rate works. In the adjoining stables is an extensive riding school. St. James's palace, an irregular brick edifice, was the only royal mansion from the time of the destruction by fire of Whitehall, in the reign of William III., till the removal of Queen Victoria to Buckingham palace. The drawing-rooms and levees are held here, though in spite of the enlargement of the palace it is too small for such receptions. Kensington palace, where the queen was born and held her first cabinet council, was purchased from the second earl of Nottingham by William III. soon after his accession to the throne, and is chiefly remarkable for the many royal personages who have died there, including William III. and his wife, Queen Anne, and George II. The orangery is the work of Wren. The famous Kensington collection of pictures has been removed to other palaces. Marlborough house, in Pall Mall, now the residence of the prince of Wales, was built by Wren for the duke of Marlborough. In 1817 it was purchased by the crown for Princess Charlotte and her husband, the future king of the Belgians, Leopold I.; she died at Claremont before the assignment was made, but her husband lived here for some time, and Queen Adelaide, the widow of William IV., subsequently made it her home. The duchess of Cambridge resides at Kew palace, and there are various mansions for other members of the royal family. The arch-

for the queen, a chair for the prince of Wales, and the woosack (a chair cushioned with wool) in the centre of the house for the lord chancellor. Facing the throne is the reporters' gallery, and over the latter is the strangers' gallery. At either end of the chamber are three compartments covered with fine frescoes, executed by Dyce, Horsley, and Maclise. In the windows, which are filled with stained glass and lighted at night from outside, are 12 figures; and 18 niches between the windows and at either end of the chamber contain statues of the barons who compelled King John to grant Magna Charta. The entrance for the queen is at the Victoria tower; her robing room, containing Dyce's frescoes from the legend of King Arthur, faces the river, and from it she passes through Victoria gallery, a richly decorated chamber 100 ft. long, and the prince's chamber, another superb apartment, to her seat on the throne. The gallery directly fronting the throne is reserved for ladies. Since the gunpowder plot of 1605 the cellars underneath the house are always examined two hours before the sovereign's arrival. The house of commons, of the same width and height (45 ft.) and 60 ft. long, is a more austere building. It occupies the site of old St. Stephen's hall, its former chamber, and was opened in February, 1852. The strangers' and the speaker's galleries (the latter for distinguished visitors) are opposite the speaker's chair, behind which is the reporters' gallery. The royal or Victoria angle (the S. W. angle of the palace), 75 ft. square and 340 ft. high,

finished in 1857, is a magnificent work. The central spire, 300 ft. high and 60 ft. in diameter, rises above the grand central octagonal hall and the admirable groined stone vault, and is supported without a single pillar. The clock tower or belfry, 40 ft. square and over 300 ft. high, abuts on Westminster bridge, the palace clock showing the time upon four dials 30 ft. in diameter, while those of St. Paul's are only 18 ft. The great Stephen bell, cast in 1858, weighs over eight tons, but is defective, like the previous monster bell known as Big Ben. The roof is finely decorated, and the subordinate towers enhance the general picturesqueness of the effect. At the Westminster bridge end of the edifice are the rooms of the speaker and sergeant at arms, and at the Vauxhall bridge end are those of the usher of the black rod and of the librarian of the house of lords.

The upper floors accommodate parliamentary committees. The cloister court, girdled by a richly groined and traceried cloister with two floors, is one of the masterpieces of the palace, though it is chiefly a restoration. Westminster hall, 290 ft. long, 110 high, and 68 wide, and despite its size unsupported by pillars, occupies the site of the old hall of the royal palace, where some of the early parliaments were held, and which abounded in historical associations and trophies. The highest law courts of England, established in 1224 under Henry III., are still held in the renovated hall, though sooner or later they are to be removed to another locality. A small staircase leads from the E. corner of the hall into the restored crypt of St. Stephen's, beneath the modern St. Stephen's hall, which is the only relic saved from the fire of 1834, and is used as a chapel.



Houses of Parliament.

The modern St. Stephen's hall, 95 ft. long, 56 high, and 30 wide, so called from occupying the site of St. Stephen's chapel of the ancient palace, contains 12 statues of illustrious statesmen. Upward of 200 elaborately carved bosses are in the central or octagon hall (80 ft. high), from which corridors lined with fine paintings extend right and left to both houses of parliament. The poets' or upper waiting hall contains frescoes illustrative of English poetry. Mr. Barry is the principal architect of the houses of parliament. The total cost is estimated, so far as the works are completed (1874), at about £4,000,000. The decay of the stone outside and of the frescoes inside the building causes considerable uneasiness, and the general architecture of the palace and its surroundings has always been a bone of contention. The ground immediately beyond the Victoria tower has been secured, the unsafe old

tenements have been pulled down, and an embankment on the river side and a new building are in course of construction for the enlargement and safety of the structure.—The principal executive department of the government is the treasury, Whitehall, between the Horse Guards and Downing street; this is the official residence of the chancellor of the exchequer. The treasury includes the board of trade and privy council offices. A new and extensive building finished in 1870 by the architect Scott, between Downing and Charles streets, and extending thence to St. James's park and Parliament street, contains the new and elegant foreign, home, colonial, and India offices; and other improvements and extensive government buildings are projected. Military affairs are managed in the war office, Horse Guards, and in the old ordnance office, originally built for the duke of Cumberland, brother



of George III., to which Buckingham house has been added. The naval department has been managed in the admiralty, Whitehall, since 1626. Somerset house, in the Strand, forming a quadrangle with over 3,000 windows and with rooms for nearly 1,000 offices, contains the branch offices of the admiralty, the audit office, and the registrar general's offices ;



Somerset House.

nearly one half of the vast building is occupied by the inland revenue office, or the excise, stamp, legacy, duty, and property-tax offices; and the W. wing, fronting Wellington square, added in 1856, belongs to the latter bureaux.—The four inns of court, which have been described as palladiums of English liberty, consist of the Inner Temple, Middle Temple, Lincoln's Inn, and Gray's Inn; and affiliated with them are 19 inns of chancery. (See INNS of COURT.) The stately new hall of the Inner Temple was opened May 14, 1870. The great civil tribunals are the courts of queen's bench, common pleas, and exchequer, the high court of chancery and of admiralty, and the courts of probate and divorce and of bankruptcy. The new palace of justice, intended to contain all the great law courts, for which a site was purchased near Temple Bar several years ago, was recently commenced after various delays and controversies. It is expected that the eastern block of buildings will be finished in 1877, and the larger western block in 1880 or 1881. The ground includes an area of eight acres, of which an acre and a half is to be laid out as a garden. The buildings will form an irregular square, having a front of about 500 ft. on the Strand, and a depth nearly as great from the Strand to Carey street. Mr. Street is the architect. The central criminal court holds its periodical sessions in the Old Bailey, a street running from Ludgate hill to Newgate street; other sessions are held at the guildhall, Tower Liberty, Westminster, and elsewhere. Newgate, at the corner of Old Bailey

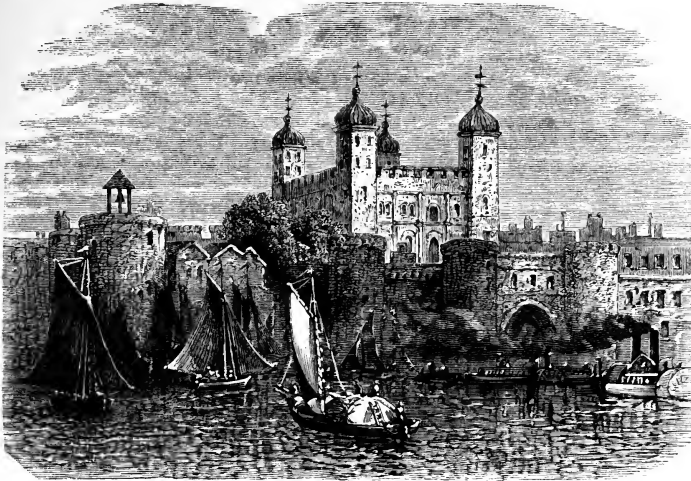
and Newgate street, is the oldest London prison, and derives its name from that of a gate of which the original building was the tower. Penn, Defoe, and other celebrated persons, as well as notorious criminals like Jack Sheppard, were lodged in old Newgate, which was destroyed by fire during the "no popery" riots in 1780. The present building was completed a few years afterward, and made the scene of public executions instead of Tyburn, the first taking place Dec. 9, 1783. The interior was remodelled in 1858 on the cellular system. Executions are no longer public, having since 1868 been performed within the walls, a black flag being hoisted as the only outward sign. The building holds about 200 prisoners. Millbank, on the left bank of the Thames, close to Vauxhall bridge, has the aspect of a citadel, and is the largest London prison, with room for 1,100 prisoners, but generally contains about 700; its inmates are sentenced to penal servitude, and hence it was originally called the penitentiary. Horseman-ger lane jail, Southwark, is the county jail for Surrey, where the Mannings were hanged in 1849; but now, as at Newgate, executions take place only within the walls. Bridewell prison was demolished in 1862, and among numerous buildings named bridewells after it is the new police station in Brick lane, Fleet street (1874). The great City of London prison at Holloway (1855) is a castellated building in mediæval style, averaging about 350 inmates. The model prison at Pentonville was completed in 1842 with 1,000 separate cells;

here the prisoners are detained during two years, and trained to useful trades. The house of correction, Cold Bath Fields, and that of Westminster for females, hold respectively about 1,200 prisoners, and are under the control of the Middlesex magistrates and the home secretary. The Surrey house of correction, Wandsworth common, is for convicted criminal prisoners, except those sentenced to penal servitude or to death; and there are female convict prisons at Fulham Refuge, and at Parkhurst, Isle of Wight. The prison for debtors in Whitecross street was in 1874 converted into a railway freight station.—The government of the greater part of the metropolis is under the charge of the home secretary, and administered under his instructions by the commissioners of police; but that portion known as the City is under the exclusive control of the corporation of London, one of the most influential and wealthy municipal bodies in the world. It includes the lord mayor, 25 aldermen exclusive of the chief magistrate, 4 sheriffs, and 206 common council men. The lord mayor is elected annually from the court of aldermen; he must have previously served as sheriff, and may be reelected. The aldermen hold office for life; they are elected one for each of the 26 wards of the City, and all resident freemen are entitled to a vote in the respective ward elections, whether liverymen or not. The number of liverymen varies between 6,000 and 8,000. Their guilds number upward of 80, 39 of which have separate halls, the rest meeting in the guildhall or in taverns. Among these are 12 formerly called honorable companies, and still holding a certain preëminence; they are the mercers, grocers, drapers, fishmongers, goldsmiths, skippers, merchant tailors, haberdashers, salters, ironmongers, vintners, and clothworkers. The guild of saddlers is traditionally the oldest of them all; saddles were known in London as early as A. D. 600. Many of the guilds are possessed of large property, and dispense the most lavish hospitality in their halls. Fishmongers' hall, mercers' hall, grocers' hall, merchant tailors' hall, the new clothworkers' hall in Mincing lane, and, above all, goldsmiths' hall, are among the finest. These guilds are intimately connected with the corporation of London. Next in importance to the corporation are the metropolitan board of works, the local boards of works, and the parish vestries, all elective bodies, which have been compared to local parliaments. The guildhall, in which the civic deliberative assembly meets, is a large but not remarkable building. The lord mayor is the representative of royalty in the civil government of the City, chief commissioner of its lieutenantancy, and conservator of the river Thames; and on the death of a sovereign he becomes *pro tem.* a member of the privy council. The day on which he enters upon office (Nov. 9) is kept as a partial holiday in the City. He then proceeds in state to Westminster hall, where he is sworn in; and in the evening he

gives a sumptuous banquet in the guildhall, which is attended by ministers and other public personages.—The metropolitan police force consisted on Jan. 1, 1874, of 9,855 persons, including 4 district superintendents, 26 superintendents, 298 inspectors, and 3,981 sergeants. The expenditures for the year ending March 31, 1874, comprised £26,897 for the cost of the offices, £797,135 for wages and equipment of the force, £527,000 for police stations, &c., and £74,878 for pensions. The receipts, including a surplus of £163,934 from the preceding year, consisted of £602,028 contributed by the parishes, £230,052 by the state, £114,584 by public institutions, £17,584 by associations and private individuals, and £1,777 by managers of theatres. The register of the police, established in 1869, contained in 1874 the names of 117,568 suspicious characters, including all petty offenders who have undergone punishment in preceding years.—The metropolitan fire brigade in 1874 employed 396 firemen, 3 floating steam and 104 land engines, of which 21 were worked by steam and 83 by hand. The engines have generally seven-inch barrels with eight-inch stroke. Small engines are drawn by hand or by one horse; two horses are used for distances under 6 m. and four for remote localities. Two engines are united in cases of emergency, and together throw 180 gallons in a minute; one of the floating engines throws 1,400 gallons. The pumps are worked by levers, and horizontal bars enable a large number of firemen to operate at the same time upon the same pumps. The number of large fires in 1870 was 276, and of small fires 1,670; altogether 1,946, or 555 above the average of 10 preceding years. In 1873 there were 105 fire escape stations, 181 day and 90 night watches in the metropolis, and 1,548 fires.—The tower of London, the most celebrated citadel of England and the only fortress of the metropolis, is of very ancient origin, and has been traced to Julius Cæsar, but without sufficient authority. It contains a renowned collection of armor, in the galleries known as the Horse armory and as Queen Elizabeth's armory. The regalia of the English monarchs is in the jewel room. Among the most memorable spots are the traitors' gate, now closed, through which Raleigh, Sidney, Russell, and other eminent men were ushered into the tower, and the fine arch of which was restored in 1866; the bloody tower opposite the gate, where the sons of Edward IV. were murdered at the instigation of Richard III., and which the duke of Wellington regarded as the securest place of imprisonment; and the white tower, the oldest relic of the building, constructed by William the Conqueror, and externally remodelled by Wren, but almost unchanged in the interior. Beauchamp tower, where Anne Boleyn and Lady Jané Grey were detained, and named from Thomas de Beauchamp, earl of Warwick, was restored in 1853. On Tower hill, N. W. of the tower,

is the site of the scaffold, and most of the eminent persons executed there were buried in the adjoining St. Peter's church. The lieutenant governor resides in the bell tower,

opened Dec. 1, 1868, has superseded Newgate as the great carcass market of London. It is a fine building flanked by four corner towers, covering  $3\frac{1}{2}$  acres, 630 ft. long by 246 wide,



The Tower.

and the governor is called constable; the duke of Wellington held the latter office for some time. The former banqueting hall and council chamber have been appropriated to a collection of 60,000 stand of rifles, and the old St. John's chapel has been converted into a record and archive office. (See "Historical Memorials of the Tower," by Lord de Ros, London, 1866-'7.) The Wellington barracks, a large and rather clumsy building, was established in 1845 by the duke of Wellington, on the N. side of the white tower, on the site of the great storehouse laid out by William III., which had been burned in 1841, together with about 300,000 stand of muskets and small arms. At the present time there are vast stores of ordnance in the tower. The number of soldiers in the various barracks is over 8,000. The duke of Wellington frequently called attention to the exposed condition of the metropolis in the event of a foreign invasion. The Franco-German war of 1870-'71, and the appearance of a publication entitled "The Battle of Dorking," with an imaginary description of a German invasion, revived these discussions, and resulted in an increasing efficiency of the militia, and in forming organizations of volunteers.—The metropolitan cattle market, Copenhagen Fields, between Islington and Camden Town, which has replaced old Smithfield market, was opened in 1855, and extends over 30 acres, half of which is enclosed for the accommodation of the animals; the annual sale of cattle, sheep, and pigs is estimated at nearly 5,000,000. The foreign cattle market is near the Commercial docks. The new metro-

politan meat and poultry market, Smithfield, opened Dec. 1, 1868, has superseded Newgate as the great carcass market of London. It is a fine building flanked by four corner towers, covering  $3\frac{1}{2}$  acres, 630 ft. long by 246 wide, with a roof of iron and glass 30 ft. high, supported on wrought-iron pillars. It is provided with stalls for the sale of meat. Underneath the building is a railway depot, with cellars for storing meat, which communicate with underground railways and with the cattle market. Leadenhall market is a large market for meat, poultry, and live stock. Of the minor markets, the Hungerford and Farringdon are the largest. The latter is the great market for water cresses, and is crowded with the masses of the poor-

er population, particularly early on Monday morning. Oxford and King's Cross are the other principal general markets. The Great Northern railway market, York road, King's Cross, and that of Spitalfields, are for potatoes. The exhibition of cattle by the Smithfield club and agricultural shows are held at Christmas in the capacious agricultural hall, between Liverpool road and Islington green, which was opened in 1861. Owing to the compulsory closing of private slaughter houses, additional public ones will be erected near the metropolitan cattle market. Inferior horses are sold every Friday in the cattle market, and the most valuable horses are sold at Tattersall's, Grosvenor place, so called after Richard Tattersall, originally a training groom of the duke of Kingston, who made his fortune by purchasing for £2,500 the celebrated horse High-flyer. During the races Tattersall's presents a most animated appearance, the betting there regulating that of the whole country. In connection with Tattersall's is a subscription room under the superintendence of the Jockey club in Old Bond street, which is attended by all the patrons of the turf. Billingsgate, the great fish market, a little below London bridge, has been famous since the days of Queen Elizabeth, though it was not formally established as a market till 1699, under William III. Fish of all kinds, but especially salmon and shell fish, are sold here in immense quantities. The corner stone of a new market was laid in Billingsgate in the autumn of 1874. Columbia market, a gift of Lady Bardett-Coutts, was publicly accepted by the lord mayor and corporation for use as a fish market, Nov. 4, 1871.

Besides £109,000 for the western extension of the metropolitan meat market, and £28,393 for that of Billingsgate, the City spent in 1873 £87,231 for the maintenance of various markets, of which £75,284 was derived from the two great metropolitan markets, and about £10,000 from the others. Covent Garden has been since the middle of the 17th century the principal market for fruits, vegetables, and herbs, and the present market place dates from 1830. Early on summer mornings it is especially animated and fragrant. A flower market covered with glass, the finest in the world, was erected in 1859, on the S. side of the Covent Garden opera house, and is accessible both from the fruit market and from Bow street; it is proposed to remove it to another locality. The other London fruit and vegetable markets are the Borough and the Farringdon. Rag fair is held in Middlesex street, near Tower hill, and is almost exclusively devoted to the sale of old wearing apparel. Another market of the kind in Houndsditch occupies a square open area a little off the street, and is of a somewhat more miscellaneous character; broken umbrellas, old iron, bones, pieces of old harness, all sorts of wearing apparel, and articles of the meanest description, are gathered and sold here. The most celebrated commercial marts are the coal exchange in Thames street, the corn market in Mark lane, and the colonial produce market in Mincing lane. A wool market was opened in 1874 near the guildhall, in an elegant building with extensive accommodations, and there are various other special localities for markets and salesrooms.—The port of London extends nominally and legally  $6\frac{1}{2}$  m. below London bridge, to a point called Bugsby's Hole, over against Blackwall; but the port itself does not reach beyond Limehouse, though the port sanitary jurisdiction extends over 88 m., with 8 sets of docks and 13 creeks. The "Pool" commences just below London bridge, where the river is divided into two channels by the treble range of colliers anchored in it to discharge their cargoes. Only a certain number of the colliers are admitted into the Pool at once, the remainder waiting in the lower pool until the flag which denotes that it is full is lowered, when those enter whose turn is first. Close to London bridge there is water sufficient for vessels of 800 tons. The legislature has placed the shipping of the port and their moorings under the direction of harbor masters nominated by the City corporation and ratified by the Trinity house. The society of the Trinity house, on Tower hill, incorporated in 1815, possesses great wealth; it has the superintendence of the placing and repairs of landmarks and buoys to indicate the channels, and of the whole English lighthouse system, and the appointment and control of pilots. Although the conservation of the river is in some measure under the care of the City corporation, Trinity house has concurrent jurisdiction. The

principal docks of London are the West India, East India, London, St. Katharine's, Victoria, and Commercial. (See Dock.) A little below the tower are the St. Katharine's docks, enclosed by warehouses, over which the masts of the larger shipping are observable. Next are the London docks, with famous wine vaults. On the opposite shore is the grand Surrey dock, devoted together with the Commercial docks to the timber and corn trades. A little below the Pool, where the river bends abruptly in its course at Limehouse reach, is one of the entrances to the West India docks, which run across the base of the tongue of land called the Isle of Dogs and open into Blackwall reach, the vast number of masts seen across the pasturage resembling a forest of leafless trees. The East and West India docks have been recently extended by the construction of a new south dock covering 33 acres, with many quays, jetties, warehouses, &c., and four pairs of gates, the main lock being 300 ft. long, 55 ft. wide, and 30 ft. deep at high tide. Other extensions and tunnels for the convenience of intercommunication between the great docks are in course of construction. The total number of wet docks in London is now 28. The authorized share capital of the East and West India dock companies (1874) is £1,005,688; of the London and St. Katharine's, £5,756,697, besides £1,062,500 in debenture stock; of the Milwall, £500,000; and of the Surrey Commercial, £964,813. Opposite Greenwich are many ship builders' yards. Below Greenwich the shores on either side are exceedingly flat as far as Blackwall, where are the East India docks, full of the largest merchant ships. Still further down the river is Woolwich arsenal, the largest government ordnance depot; and here also is a depot for convicts. Gravesend, the last town on the banks of the Thames, is about 20 m. from London. Parallel to the basin near Dog and Duck stairs, sometimes called the East Country docks, leading to the Commercial docks, is the Surrey canal, which communicates with the Croydon canal. The Regent's canal (9 m. in length, and provided with 12 large locks) communicates with the Grand Junction canal, and passes from Paddington by a tunnel under Maida hill to Regent's park, thence to Islington, under which it is carried by a tunnel  $\frac{3}{4}$  m. long, and so on to Hoxton, Hackney, and Limehouse. Some of the local traffic is carried on by means of these canals. The principal commerce passes through the docks. At Deptford, 3 m. S. E. of London bridge, and contiguous to Greenwich, is the victualling department of the navy; but the royal dockyard and ship-building establishments were closed March 13, 1869 (see DEPTFORD), and those at Woolwich on the following Oct. 1. A new royal dockyard was opened at Chatham, 30 m. S. E. of London, June 21, 1873, where as well as at Portsmouth extensive preparations for additional docks are

in progress. The custom house, in Lower Thames street, dates from 1817, but the original centre subsequently gave way, and a new front facing the river was erected. It contains an appropriately named long room, being nearly 200 ft. long and 66 wide, in which about 2,500 persons are employed. The annual amount of duties received varies from £10,000,000 to £12,000,000, generally exceeding half of the average customs revenues in all the other ports of the country. The royal mint, on Tower hill, soon to be removed to another locality, in 1872 struck 52,841,048 coins, and 672 tons of metal passed through the melting department during that year. The amount of money coined fluctuates considerably, the lowest since 1855 having been £723,540 in 1867, and the highest £16,426,663 in 1872. The amount paid for gas was £2,544,132 in 1873. It is a monopoly of nine great

globe, upon which money is advanced, as well as upon floating cargoes. Except at the stock exchange (enlarged in 1873, and then consisting of 1,787 members besides 1,146 clerks), where gambling in stocks and shares produces recklessness of manner, business of immense amount is transacted everywhere with little or no excitement, and with most decorum at the royal exchange (see EXCHANGE), though bills for fabulous sums, crops of great continents, and charter parties for whole fleets of merchant vessels pass here from hand to hand within barely one hour in the afternoon. Intensely national and homogeneous everywhere, London is cosmopolitan only in the City, where all nationalities are represented: the Greeks in the Levant, Mediterranean, and transoceanic trade; the Germans in the Baltic and other foreign trade; and there are French, Italian, Dutch, Swiss, Russian, Scandinavian, Belgian,



Royal Exchange.

companies, and it is suggested to place in future the gas supply of the metropolis under the direction of the board of works. Upward of 4,000,000 tons of coal reached London in the first seven months of 1874, and the duty of 9d. per ton produced in 1873 £224,891, and the City's duty of 4d. £99,951, both amounts being appropriated to local improvements.—The bank of England, Threadneedle street, is the most important of the banks (see BANK); and among the other establishments are the Union bank of London, the London and Westminster, the London and Southwestern bank, the London and County banking company, and many others of great importance. The bankers' clearing-house return for the week ending March 6, 1873, was the highest on record, amounting to £161,770,000. The overflowing abundance of capital makes London the regulator of the world's money markets, and draws thither consignments from all parts of the

Spanish, American, and other foreign merchants. The important East and West Indian, Australian, American, and domestic trade, however, is chiefly in the hands of the indigenous houses. The most influential Jews of London are the Rothschilds, Sir Moses Montefiore, the baronet Goldsmid, and several German financiers. The principal insurance, telegraph, gas, mining, and other companies, and many banks, are authorized to issue shares, which increase the speculative business and that for permanent investment. Many colonial

and foreign securities, bonds, and shares are negotiated here, and there are few undertakings in any part of the world which do not look to London capital for support. The financial and commercial operations vary according to the ebbs and tides in agricultural and other productive and manufacturing resources, and in the general condition of the empire and the world. There has been great prosperity within the last few years, the absorption of American shipping during and since the civil war in the United States, and the progress of Australian and other colonies, vastly increasing the activity of the London markets. The registered merchant shipping of the port, Jan. 1, 1874, comprised 1,993 sailing vessels of 694,218 tons, and 846 steamers of 447,839 tons. The total number of vessels that entered during the year ending Dec. 31, 1873, was 38,810, of 7,843,041 tons, including 11,017 vessels, of 4,547,934 tons, from foreign countries



and British possessions, and 27,793 vessels, of 3,295,107 tons, in the coastwise trade. The total number of clearances was 18,895, of which 10,284 were in the coastwise trade. The imports of foreign and colonial merchandise were valued at £127,560,447, on which the customs revenue amounted to £10,103,085. The exports of British produce amounted to £57,199,098. The exports to the United States in the year ending Sept. 30, 1871, amounted to £8,658,037; 1872, £8,671,985; 1873, £7,579,073. In 1873, 29 vessels, of 6,881 tons, were built here. The average number of ships in the port is 1,000, and in the docks 600 to 700. The emigrant traffic is considerable, 21,400 having left for New Zealand alone in the first six months of 1874; and a new emigrant bureau was recently opened in Blackwall.—The leading manufacture of London is silk, which employs over 100,000 persons, mostly females. The other principal articles made are telegraph wires, carriages, clocks, watches, jewelry, gold and silver plate, mathematical, surgical, and musical instruments, refined sugar, and particularly ale and porter. The largest breweries are those of Barclay, Perkins, and co., Southwark, extending over 11 acres, and of Truman, Hanbury, Buxton, and co., Spitalfields; the quantities of malt annually used in these establishments varies from 120,000 to 150,000 quarters, and in the other extensive breweries from 18,000 to 60,000.—The telegraph act of 1868 placed the electro-telegraphic system of the country under the control of the government. The central station is to be in the new general post office in St. Martin's-le-Grand, the most imposing of the recent additions to city architecture. There are now over 400 telegraph offices in the metropolis, mostly post offices, and the metropolitan gallery at the central station is made the medium of communication between them all. The pneumatic despatch tubes form an important adjunct to the telegraph system for carrying sheets of paper on which messages are written, and also constitute a sort of metropolitan parcels conveyance system. An improved method, extending the working of the same tube over several stations, has been in operation since 1871. The central station is connected with receiving offices in the principal centres of business. The employees of the British post office department consisted in 1872 of more than 40,000 persons, of whom 10,000 were engaged in telegraph work, 12,000 were postmasters, 9,000 clerks, and 19,000 letter carriers, messengers, and sorters. Those engaged in London alone include 5,000 in St. Martin's-le-Grand and 4,500 in the postal districts. Of the 20,600 post offices and public boxes in the United Kingdom, London possesses 1,500. The total number of post office telegrams from all the stations in the kingdom numbered 399,852 in the week ending Aug. 22, 1874. The number of letters delivered in the postal districts of London is over 6,000,000 annually, of newspapers over

70,000,000, and of book parcels about 8,000,000. The letter deliveries are numerous and admirably arranged all over the metropolis and its outskirts. The money order offices, also serving as savings banks, were 4,600 in the kingdom in 1872, and 14,000,000 orders were issued, to the extent of £24,000,000; the depositors in the post office savings banks numbered 1,440,000, and their aggregate deposits were from £17,000,000 to £19,000,000. The expenditure of the post office in 1872 was £3,685,000, and the net revenue about £2,150,000. A large proportion of all these figures concerns London alone.—A girdle of railways and a double circle of iron ways, chiefly underground, encompass London. The metropolitan or underground railway runs on a level with or below the gas pipes and water mains, and consists of 3½ m. of tunnels and cuttings from Paddington, near the Great Western terminus, to Moorgate, near the bank of England, running under the New road and other central thoroughfares. The trains run from early in the morning till midnight at intervals of 15 to 20 minutes, communicating at King's Cross station with the Great Northern terminus, and at Farringdon street with the prolongation line to the Chatham and Dover railway. Among the principal metropolitan and suburban railway lines are the Charing Cross, to the City and London bridge; the West London, Hammersmith, and Metropolitan, from Finchley road to Victoria station; the Victoria, from Pimlico to Ludgate hill; the North London, Hampstead junction, and North and South-western junction, from Broad street, City, to Acton station beyond the Hammersmith station; the London and Blackwall; the Waterloo, to Richmond; and the East London, commencing at the Wapping end of the Thames tunnel, and terminating at Deptford. The Metropolitan District railway, with many remarkable viaducts and similar works, runs parallel with the N. Thames embankment, extending from Tower hill to Westminster bridge. The Metropolitan and St. John's road extends from Baker street to within a mile of Hampstead. The total number of railway stations in metropolitan districts has increased from 3 in 1838 to about 300 in 1874, and the aggregate traffic includes hundreds of millions of passengers and stupendous quantities of freight. The Great Eastern began in 1873 its enormous terminus at Broad street; the Midland railway has opened the large St. Pancras station; the East London is engaged in tunnelling under the London docks; and other new termini are completed or projected. Street tramways, after meeting with a strenuous resistance, and still opposed by the corporation of the City, were sanctioned by parliament in 1869 for various parts of the metropolis, and subsequently for others.—The Thames tunnel, two miles below London bridge, connects Wapping on the left bank of the Thames with Rotherhithe. It consists of two arched passages, 1,200 ft. long,

14 ft. wide, and 16½ ft. high, separated by a brick wall 4 ft. thick with 64 arched openings. The crown of the arch is 16 ft. below the bottom of the river. The descent and ascent are effected by stairs winding round cylindrical shafts 38 ft. wide and 22 ft. deep. It is the greatest achievement of the elder Brunel, and was commenced March 2, 1825, interrupted by an inundation Aug. 12, 1828, recommenced in January, 1835, and opened March 25, 1843. The total cost was £468,000. The penny toll and other receipts were under £6,000 annually, and the constant influx of land springs caused considerable expenditure. The tunnel was consequently sold in 1865 for £200,000 to the East London railway company for connecting the Great Eastern and North London railways with those on the south of the Thames; and it was altogether closed as a public footway on July 19, 1869. A new tunnel, known as the Thames subway, was commenced Feb. 16, 1869, by breaking ground for the shaft on Tower hill; and in February, 1870, a number of persons were already conveyed from one shaft head to the other; the cost was only £20,000. It is 25 ft. below the bed of the river; the passage is accomplished by a tubular displacement of about 8 ft. in diameter, and its entire course is through the impermeable London clay. The shafts are less than 60 ft. deep and 10 ft. in diameter, and are lined partly with cast-iron cylindrical rings, and partly with brickwork in cement. The omnibus runs upon a railway of 2 ft. 6 in. gauge, and is lighted by colza oil lamps, as are also the lifts and the waiting room. The subway is remarkable for its dryness, but the temperature is high. Its success led to the construction of another subway or tunnel from Arthur street to St. George's church, Borough, passing under the principal districts of the city of London and of Southwark. An additional tunnel from Poplar to Greenwich, entering close to the East and West India docks, is intended to benefit the traffic between the N. and S. parts of the river.—Penny and twopenny steamers ply between London bridge and the West End bridges, and stop at many piers, including Greenwich; but, though still overcrowded, especially in summer, they are destined gradually to disappear before the more speedy means of communication. Boats for Margate and Ramsgate start from London bridge; and the steamers for continental ports start from the same point, and from St. Katharine wharf or Tower stairs. Many lines of packets leave London for Australian, East Indian, American, and other transoceanic ports.—The omnibus service comprises about 100 metropolitan and suburban routes, and employs nearly 1,200 coaches and 12,000 horses. The annual receipts are estimated in the aggregate at £1,000,000, and the number of passengers at over 80,000,000. The vehicles traverse a circuit of about 300 streets, and about 24,000,000 miles annually, the daily average for each omnibus being 60 m. The

coaches are slow and uncomfortable, and are shunned by ladies, but they are nevertheless overcrowded. The London general omnibus company, the largest, runs about 600 coaches. The drivers are employed from 12 to 16 hours a day. Hackney carriages were till 1869 under the control of the board of inland revenue, and were subsequently placed under that of the commissioners of police. The taxes have been reduced considerably, and the horse duty has been abolished altogether. Cabs have consequently increased from 5,687 in 1869 to 7,341 in 1870, 7,818 in 1871, 8,160 in 1872, and 9,655 in 1873; and the number running in the autumn of 1874 comprised 3,641 Hansom and 4,223 Clarence cabs, altogether 7,864. Stringent regulations have been passed to insure safety, speed, and comfort; and since Jan. 1, 1874, the cushions are required to be of horsehair and other good material, and not as formerly stuffed with hay, straw, seaweed, or whalebone shavings. There are 2,800 proprietors, of whom only 89 own more than 20 cabs each. The proprietor lets them out by the day to licensed drivers at an average price of 18 shillings during the season, and as low as 6 shillings at slacker periods. The number of licensed drivers is 10,093, exceeding that of the cabs. The rates of fare are strictly regulated by law, and the cabmen complain of hardship and risks, especially as they are often obliged to pay the proprietors in advance. The number of persons run over and killed by these and other conveyances in 1872 was 118, which was below the average of the six preceding years; the maimed or injured were 2,677, a number much above previous averages.—The main drainage of London has been carried out since 1859 by the metropolitan board of works, through a series of large sewers under streets and buildings on both sides of the river, at right angles with the old and defective sewers and a little below their level, in order to intercept the sewage and prevent it from contaminating the river in its passage through London. The termini of the sewers are at Barking creek, on the left bank, and at Crossness, near Plumstead, on the right bank of the Thames, where they discharge through a general outfall channel. Much of the sewage is carried away by gravitation, excepting that of the low levels, which must be pumped up by steam engines into the outfall channels after having gone through a process of deodorization. The high-level Clapham channels, S. of the Thames (10 m. long), unite with the low-level Putney channel (11 m. long) at Deptford creek, whence they run to Erith over a distance of 7 m. The three great Hampstead, Kilburn, and embankment sewers, N. of the Thames, form a junction on the river Lea. The bridges, aqueducts, culverts, and conduits are on the largest scale, especially at Bow creek, below Blackwall; and one of the finest pumping stations is at Abbey mills, West Ham, where the low-level drainage is lifted by steam to the upper

level. The sewers formerly emptied into the Thames, and during the rise of the tide over their orifices the whole drainage was stopped until the ebb set in, converting the sewers into cesspools. At present the sewers are diverted to reservoirs. Much of the sewage is utilized for agricultural purposes. The average daily amount discharged on the N. side of the river is estimated at over 10,000,000 cubic feet, and on the S. side over 4,000,000. The whole system was nearly completed in 1874.—The fluctuations in the water supply give rise to periodical alarm in the overcrowded districts, and schemes are proposed from time to time to increase the quantity and to improve the quality by artificial supplies from mountain regions. But the basin of the Thames continues to be the great reservoir of London, and it is believed that only careful filtration, removal of old cisterns, and other improvements are needed to make the water adequate to all requirements. It is supplied by eight companies, five on the N. and three on the S. side of the river, on the so-called intermittent system. The supply pipes are not attached to mains in which the water is always under pressure, but to smaller pipes into which it is daily turned on for one or two hours. The average quantity supplied daily in July, 1874, was 127,563,243 gallons. The royal commissioners on the water supply believe that the amount may be increased by the existing companies to 180,000,000 gallons, which they deem sufficient for a maximum of 5,000,000 residents at the height of the season. Drinking fountains are also increasing in number in public thoroughfares and parks. Extensive new swimming baths were opened near Hungerford bridge in 1874, and a similar establishment is in course of construction near Pillico pier.—The law has been made stringent in regard to the immediate removal of offensive burial grounds; and the increasing demolition of old churches leads to the removal of the dead to cemeteries, although many of the churchyards in the older parts of London remain undisturbed. Many new cemeteries are required in addition to the present number, which includes Bunhill Fields, near Finsbury square (for dissenters); and there is a general tendency to lay them out in fine localities, as Norwood, Kensal Green, Brompton, and Highgate cemeteries, and in remoter rural districts. The public health act of 1872 was the complement of the local government board act of 1871, and both were results of the royal sanitary commission of 1869–70. The mean temperature of the year is 50·5°; that of the surrounding country about 48°. In January it averages 36·34°, February 39·6°, March 42°, April 47·61°, May 55·4°, June 59·36°, July 62·97°, August 61°, September 57·7°, October 50·79°, November 42·4°, December 38·71°. The temperature in summer seldom rises to 80° in the shade, though occasionally going above 90°, and seldom falls in winter to 20° during the day, but has sunk as low as 5° be-

low zero at night. The mortality reached the annual rate of 23·1 in 1,000 in 1871, and declined to 20·7 in 1872, 20 in 1873, and 19·9 in the year ending June 30, 1874, being 2·6 lower than the average rate in the urban districts generally, 2·2 lower than that in the 18 large towns, 1·1 below the rate for the whole of England and Wales, and only 0·8 higher than the rate in the rural districts. Of 123,990 who died during the spring quarter of 1874, nearly 60,000 had escaped the perils of infancy, but were cut off before they attained old age.—London has a great drawback in its moist climate, though it is not considered unhealthy. The sufferings and hard realities of life are also more glaring in this overwhelming concentration of people in one and the same community than among more scattered populations. The noises, too, in the centres of traffic are bewildering. But there are not a few spots of idyllic stillness in the midst of perpetual motion, and London is on the whole the city of all cities where persons of all degrees and tastes can live in perfect independence, without being interfered with as long as they do not interfere with others, well protected in their lives and property, and with many reasonable opportunities of uncostly enjoyments. The metropolis presents the most edifying spectacle at early dawn, when caravans of wagons arrive with provisions for the still sleeping millions; the most dazzling late in the evening, when the popular thoroughfares swarm with the multitude, and are ablaze with light; and the most ominous during the night, when the dangerous and degraded classes prowl through the streets. During great processions the dangerous classes still constitute a formidable mob, such as alarmed the queen at the time of her coronation. The East End supplies the contingent of roughs, and the West End that of drones and idlers. Apart from the many criminals in the prisons, there are thousands on the verge of crime and without visible means of existence.—The first authentic notice of the existence of London (*Londinium*) occurs in Tacitus. About 100 years after Julius Cæsar's invasion, it was taken by the Romans under Claudius, called Augusta, and placed under a Roman administration. In A. D. 61 the Britons under Boadicea captured and burned the city, which was however soon rebuilt. It is supposed to have remained unprotected by fortifications until the reign of Constantine the Great, who, judging from many coins which have come to light, is believed to have constructed the walls of London and to have erected it into an episcopal see. The walls commenced in the vicinity of the present tower, and their compass was completed by another wall along the banks of the Thames. Gates were added to these walls, and roads laid out which led to different parts of the country. The names of the gates are perpetuated in various localities; a considerable portion of the old New gate was excavated

in 1874. The great Roman roads Watling street and Ermin street had their termini at the Roman *milliarium* or London stone. A portion of the stone still exists, and is inserted in the most prominent part of St. Swithin's church, Cannon street. Under the Saxons London is believed to have become the capital of the East Saxon kingdom, and to have quickly recovered from the disasters to which it had been subjected after the departure of the Roman troops from England. Bede calls it even at that early period "a princely town of trade." St. Paul's and St. Peter's, Westminster, were founded almost immediately after the introduction of Christianity. Under Egbert London became the metropolis of the united Saxon monarchies, or of the consolidated kingdom, so that the metropolitan character of London has existed 1,000 years. The Danish invasion was disastrous to the prosperity of London, but it soon recovered under the glorious reign of Alfred. William the Conqueror, to whom the city submitted after the battle of Hastings, granted it a charter which is still extant. A new charter was given by Henry I. in 1100, which is said to have served as a model for Magna Charta; it restored the privileges which the Londoners had enjoyed before the conquest, and permitted them to elect their own magistrate. In 1191 the chief magistrate was for the first time addressed by the court of aldermen by the title of lord mayor. The insurrection of Wat Tyler in 1381 produced a temporary alarm. In the wars of the roses, London sided chiefly with the house of York, in consequence of which the lord mayor and sheriff and a number of aldermen were knighted by Edward IV. after the battle of Barnet (1471). About this time Caxton introduced the printing press. Intellectual and religious zeal was powerfully fostered by the reformation; educational and charitable institutions were introduced; the refugees of the Low Countries naturalized their industrial arts and manufactures in London; and the prosperity of the city advanced with rapid strides during the reign of Elizabeth. The chief part of the metropolis consisted then and during the reign of James I. of Newgate street, Cheapside, the Poultry, and Cornhill, and the crooked streets and dingy alleys leading from them to the river. Both sides of the Strand, toward Westminster, were flanked with houses. The south river side of the Strand was then the headquarters of the aristocracy. The other parts of London did not yet exist, except from Charing Cross toward Whitehall palace and Westminster abbey. There were but few buildings in Lambeth and Southwark, and only a small number of scattered houses from Horsleydown to Tooley street. A majority of the corporation took a decided part with the commons during the civil war. After the restoration London began to revive, but the plague, which had already visited it in 1349 and in 1604, again raged in the city from June till the end of

December, 1665, carrying off upward of 60,000 persons. Fire, which had nearly consumed the city in 893 and at various other periods, especially 1077 and 1087, broke out a year after the visitation of the plague, commencing Sept. 2, 1666, in Pudding lane, Monument yard, and ending at Pie corner, Giltspur street, having lasted four days and nights, and reduced to ashes five sixths of the whole city within the walls. The city was however rebuilt within four years, and the calamity was commemorated by the monument previously noticed. The population was then about 200,000. The first stone of St. Paul's was laid in 1675. In 1685 many French Protestants, whom the revocation of the edict of Nantes had driven from France, found an asylum in London, and settled in Spitalfields, introducing the silk manufactures which have since become of the utmost importance. In the reign of Anne an act was passed (1711) for building 50 new churches, in consequence of the increase of the population. Clerkenwell, Soho, and other streets and districts were then annexed to the metropolis. Street lamps had been used as early as 1416, but the streets were first generally lighted under the reign of Anne. Some additions to London in the time of George I. were followed by important enlargements during that of George II. Grosvenor square, Westminster bridge, and new streets were then built, and great roads laid out in several directions. Extension and improvement became still more the order of the day under George III. Blackfriars bridge was built, and many new dwellings were erected on the Surrey side. The American war caused a suspension of activity, which however after the peace in 1783 was doubly increased. Owing to the increase of trade with the United States and other parts of the world, the ground near the water side was soon covered with buildings, and docks were constructed, while fashionable squares and streets soon sprung up in the west in rapid succession. From the regency in 1811 dates the astonishing progress of London in the elegance of its parks and new streets. Regent's park was then formed and surrounded with handsome terraces, and many improvements gradually took place. The discovery of gold in California, and at a later period in Australia, marked new eras in the march of progress, which in more recent periods has further advanced with giant strides.—The great associations of London with the history and literature of England invest the quaint localities and buildings in the antiquated parts of the metropolis with varied interest. Hardly any of them can be passed without meeting with interesting curiosities and great memories of the past. Some of the streets teem with remembrances of Oliver Cromwell, Hampden, and Milton; others with those of Bacon and Newton, Spenser and Shakespeare. In the same street (Bread street, Cheapside) where Milton was born stood the Mermaid tavern,

frequented by Shakespeare, Raleigh, and Ben Jonson. Not far from the Cockpit in Charing Cross, where Oliver Cromwell lived for some time, died the poet Spenser. Lord William Russell was beheaded in Lincoln's Inn Fields. The earl of Strafford, Algernon Sidney, and other eminent men were put to death on Tower hill, and Anne Boleyn, Catharine Howard, and many others near the tower of London. Charles I. was executed in the street facing the banqueting house at Whitehall. The Tabard inn, Southwark, which has been pulled down, was the starting place of Chaucer's pilgrims. In the Inner Temple lane is the house where Pope and Warburton first met. Fielding wrote his "Tom Jones" in Bow street, Covent Garden, in a building now occupied by a police court. The regions of Fleet street, with the Mitre tavern, where Johnson and Boswell met, and of Temple Bar and the Strand, abound with associations of Dr. Johnson, Oliver Goldsmith, and their contemporaries. Temple Bar and old Smithfield were full of antiquarian interest, the latter in connection with religious persecutions and with executions; and it was in Leicester square that the unfortunate queen of Bohemia (the so-called queen of hearts) and other royal personages once resided, and where afterward art flourished in the studios of Hogarth and Reynolds, science under the roof of Newton, and surgery in the schools of Hunter and Bell. (See "Leicester Square, its Associations and its Worthies," by Tom Taylor, London, 1874.)—The general and special works on different periods and on the history, curiosities, characteristics, and works of art of London are very numerous; but even the instructive and interesting illustrated "London," edited by Charles Knight (new ed., 6 vols., 1851), is becoming rather antiquated in view of the new improvements. The finest recent pictorial illustrations of London are by Doré, with text by Blanchard Jerrold (1872).

**LONDON**, a city and inland port of entry of Canada, capital of Middlesex co., Ontario, situated on the river Thames, at the junction of the Sarnia and Port Stanley branches with the main line of the Great Western railway, and at the terminus of a branch of the Grand Trunk line from St. Mary's, 105 m. W. S. W. of Toronto, and the same distance E. N. E. of Detroit, Mich.; pop. in 1852, 6,034; in 1861, 11,555; in 1871, 15,826; in 1874, 18,113, besides 7,000 in the suburbs. It is regularly laid out, with wide streets crossing each other at right angles and lighted with gas, and has many handsome buildings. The crystal palace is a fine structure, erected for exhibition purposes, with extensive and well adapted show grounds. The Great Western railway depot is a fine brick building, and the company has workshops here also. The other principal public buildings are the custom house, post office, court house, jail, city hall, Covent Garden market, the banks, and several of the churches. At the foot of Dundas street are white sulphur

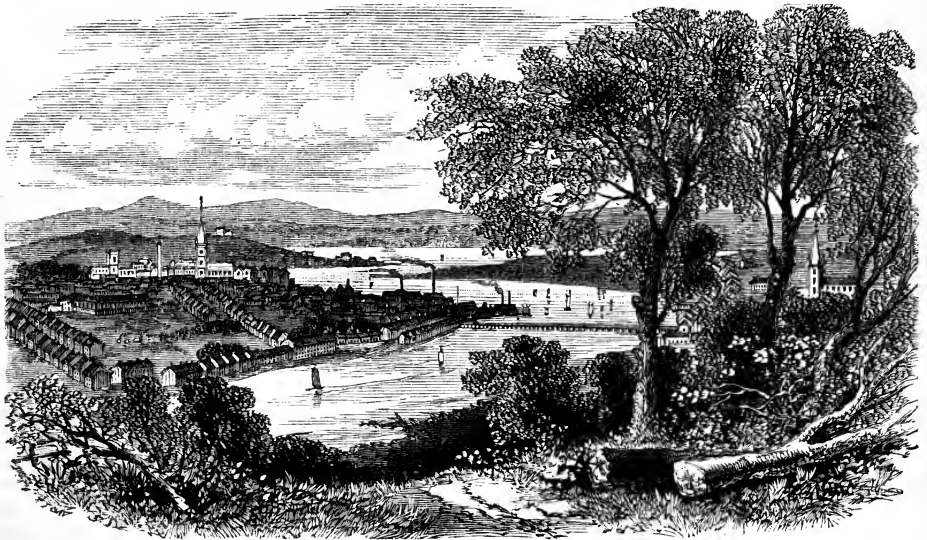
springs, famed for their medicinal properties, which in summer attract large numbers of invalids and tourists. The city is the centre of a fine agricultural district, and has an important trade in wheat and other produce. Its manufactures are considerable, embracing the products of extensive iron founderies and machine shops, mills, breweries, chemical works, petroleum refineries, and tanneries; besides boots and shoes, soap and candles, musical instruments, cabinet ware, carriages, &c. There are six branch banks and several hotels. The value of imports for the year ending June 30, 1873, was \$2,555,767; of exports, \$1,629,532. London is divided into seven wards, is governed by a mayor and aldermen, and has an efficient police force and fire department. The charitable institutions are a lunatic and an idiot asylum, the city hospital, orphan asylum, and the society for the deserving poor. There are three colleges under Episcopal management, occupying handsome brick buildings on an eminence in the N. part of the city, surrounded by extensive grounds, viz.: Huron college, established in 1863; Hellmuth college, in 1865; Hellmuth ladies' college, in 1869; and a commercial college. The Roman Catholic convent has a young ladies' seminary connected with it. There are nine public schools, three daily, one tri-weekly, and five weekly newspapers, three monthly periodicals, and 19 churches, including the church of England and Roman Catholic cathedrals.

**LONDONDERRY**. I. A N. county of Ireland, in the province of Ulster, bordering on the Atlantic ocean, Lough Foyle, and Lough Neagh, and on the counties of Antrim, Tyrone, and Donegal; area, 802 sq. m.; pop. in 1871, 173,982. In the centre and toward the south the surface is mountainous, and elsewhere mostly lowland, which is generally fertile. The principal rivers are the Foyle, Bann, and Roe. Agriculture, though improving, is not in a very advanced state. The principal manufacture is the weaving and bleaching of linen. The greater part of the county is held by lease under the corporation of London and its grantees. II. The capital, a city, parliamentary borough, and port, on the left bank of the Foyle, here crossed by a bridge 1,200 ft. long, 5 m. above Lough Foyle, and 123 m. N. N. W. of Dublin; pop. in 1871, 25,242. It is picturesquely built on an oval-shaped hill, the site of ancient Derry, surrounded by walls, beyond which however it has greatly extended. On the summit of the hill stands the cathedral of Derry, 114 ft. long and 66 ft. wide, with a spire 178½ ft. high. Besides several other churches of various denominations, the city contains Foyle college, Magee college, a district lunatic asylum, and a union workhouse. The Roman Catholic and church of Ireland bishops reside here, but both sees retain the former name of Derry, and the latter diocese has been united with that of Raphoe. The Diamond or market place, a



quadrangular area, is situated in the centre of the town, and contains the corporation hall; and from the middle of the sides of this four principal streets lead to the four original gates. A Doric column, surmounted by a statue of the Rev. George Walker, celebrated for his defence of the town in the siege of 1689, was erected in 1828 at a cost of £4,200. In 1873 the inward shipping amounted to 260,823 tons, and the customs duties to £107,188.—The ancient town of Derry, originally called Derry Calgach, took its rise from a monastery which St. Columba founded here in 546. It was repeatedly pillaged by the Danes and by the neighboring Irish chiefs, and was burned several times. In 1198 the English under De Courcy captured it. It was garrisoned in 1566, during Tyrone's rebellion, and in 1568 the fort and nearly the whole town were de-

stroyed by the explosion of a powder magazine. It was rebuilt in 1600, and eight years later Sir Cahir O'Dogherty captured it, slaughtered the garrison, and burned a large part of the town, because of its resistance to the authority of James I. The land on which it stood, as well as that of the whole county, was declared forfeit to the crown, and James made it over to the mayor, aldermen, and council of London. They constituted a body for its government, which still exists, called the "Irish Society," and parcelled out much of the county among the twelve city companies of London. The new city which they built on its ruins was called Londonderry. It became a stronghold of Protestantism, and in December, 1688, its gates were closed against James II., who laid siege to it on April 18, 1689. The siege was kept up for 105 days, when a man-of-war and



Londonderry.

two ships loaded with provisions ran past the batteries and the obstructions in the river, and relieved the starving inhabitants. The greatest cruelty had been practised by the besiegers, and the utmost suffering endured by the besieged, who had eaten all their horses and dogs, and were on their last ration of tallow and salted hide when relieved. The garrison of 7,000 men had been reduced to 3,000; the loss of the besiegers was estimated at 8,000. Since this famous siege, the city has advanced steadily in growth and prosperity.

**LONDONDERRY. I. Robert**, second marquis of. See CASTLEREAGH. **II. Charles William Stewart Vane**, third marquis of, a British soldier and diplomatist, half brother of the preceding, born in Dublin, May 18, 1778, died in London, March 6, 1854. He was made ensign of a foot regiment, and served in the Netherlands in 1794. Subsequently, while attached to

the British mission at Vienna, he was severely wounded at the battle of Donauwörth. He commanded a regiment of dragoons during the Irish rebellion of 1798, and also in the expedition to Egypt under Sir Ralph Abercrombie, in the course of which he was again dangerously wounded. In 1803 he became under-secretary of state for the war department, but resigned to take command of a hussar brigade under Sir John Moore in the Peninsula, and covered the retreat of the British army to Corunna (1809). He was adjutant general under Sir Arthur Wellesley until May, 1813, signaling himself at Talavera and elsewhere, and receiving the thanks of the house of commons. In 1814 he was made a lieutenant general, was military commissioner of the armies of the allied sovereigns, and was appointed ambassador to Austria, having in the preceding year exercised similar functions at the court of Berlin. He

was the representative of Londonderry in the house of commons from 1801 to 1814, when he was raised to the peerage as Lord Stewart, and sworn a member of the privy council. In 1815 he was one of the British plenipotentiaries at the congress of Vienna. In 1822, on the death of his brother, he succeeded to the marquissate of Londonderry; and in 1823 he was created Earl Vane, having in 1819 contracted a second marriage with the only daughter of Sir Harry Vane Tempest, and assumed the name and arms of Vane. In right of his wife he became possessed of large estates in Durham, for the development of which he constructed the harbor of Seaham, a vast undertaking for private enterprise. He was raised to the rank of general in 1837, and became colonel of the life guards in 1843. In 1852 he received the garter vacated by the death of the duke of Wellington. He is the author of a "History of the Peninsular War," and edited the correspondence of his brother, Lord Castlereagh, which was published in 1850.

**LONDON PRIDE**, a garden name for *saxifraga umbrosa*, a perennial evergreen plant from southern Europe. It has long been a favorite in Great Britain, and has escaped from gardens and become naturalized in different parts of the country, especially in Ireland, where it is known as St. Patrick's cabbage, its thick and leathery leaves, gathered in a dense cluster a foot across, being sufficiently suggestive of a cabbage to warrant the name. The flower stems are 6 to 12 in. high, and bear a loose panicle of small pink flowers, which are marked with spots of darker color. It is



London Pride (*Saxifraga umbrosa*).

used as an edging plant in old gardens, and is one of the few plants which endure the smoke of London and other cities without injury.

**LONG, George**, an English scholar, born at Poulton, Lancashire, in 1800. He graduated at Trinity college, Cambridge, in 1822. In

1824 he became professor of ancient languages in the university of Virginia, but in 1826 returned to London, in order to become professor of the Greek language and literature in the London university (now University college). In this office he remained till 1831, when he began to edit for the society for the diffusion of useful knowledge their "Journal of Education," which he continued till 1835. He edited the "Penny Cyclopædia" from 1832 to 1843. In 1837 he was called to the bar, and in 1842 he became professor of Latin in University college, but resigned in 1846, being invited by the society of the Middle Temple to deliver a course of lectures on jurisprudence and the civil law. This office he soon resigned, but in 1849 was appointed professor of classical literature at Brighton college, where he remained till 1871. Among his works are editions of Caesar's "Gallic War" and Cicero's "Orations," and a "Classical Atlas." He has published "France and its Revolutions" (1849); "Geography of England and Wales," in conjunction with G. R. Porter (1850), and "Geography of America;" and "Decline of the Roman Republic" (5 vols., 1864-'74).

**LONG, Roger**, an English clergyman and astronomer, born in Norfolk about 1680, died in Cambridge, Dec. 16, 1770. He graduated at Cambridge in 1704, became vice chancellor of the university in 1729, and master of Pembroke hall in 1733. In 1749 he was appointed Lowndes professor of astronomy, and in 1751 rector of Bradwell in Essex. At his death he bequeathed £600 to his college. He was the inventor of the uranium, a singular machine for facilitating the study of astronomy, which may still be seen at Pembroke hall. It is a hollow sphere 18 ft. in diameter, and capable of containing 30 persons. The inner surface is covered by a map of that portion of the heavens visible in Britain. The most important of his works is his "Treatise on Astronomy," in 5 books (2 vols. 4to, Cambridge, 1742-'64; 2d ed., 1784).

**LONG, Stephen Harriman**, an American engineer, born in Hopkinton, N. H., Dec. 30, 1784, died in Alton, Ill., Sept. 4, 1864. He graduated at Dartmouth college in 1809, in 1814 entered the corps of engineers of the United States army, and in 1815 became assistant professor of mathematics at West Point. In April, 1816, he was transferred to the topographical engineers. From 1818 to 1823 he had charge of explorations between the Mississippi and the Rocky mountains, and of the sources of the Mississippi in 1823-'4, and in 1826 was made brevet lieutenant colonel of topographical engineers. He was engaged in surveying the Baltimore and Ohio railroad from 1827 to 1830, and from 1837 to 1840 was engineer-in-chief of the Western and Atlantic railroad in Georgia, in which capacity he introduced a system of curves in the location of roads, and a new species of truss bridges, which has been generally adopted in the United States. He was

made major in 1838, colonel March 3, 1863, and retired June 1, 1863. An account of his first expedition to the Rocky mountains (of which one of the highest summits was named from him Long's peak) in 1819-'20, from the notes of Major Long and others, by Edwin James, was published in 1823; and in 1824 appeared "Long's Expedition to the Source of St. Peter's River, Lake of the Woods," &c., by W. H. Keating (2 vols., Philadelphia). His "Railroad Manual" (1829) was the first original treatise of the kind in this country.

**LONG BRANCH**, a village of Ocean township, Monmouth co., New Jersey, on the New Jersey Southern railroad, 28 m. S. of New York, and 63 m. N. E. of Philadelphia; permanent population about 5,000. It is situated on the shore of the Atlantic, the beach affording admirable facilities for bathing, and is one of the most celebrated summer resorts in the country. Steamers ply several times a day during the season between New York and Sandy Hook, whence the distance by rail is 11 m. The New York and Long Branch railroad, connecting those points directly, was completed in November, 1874. The principal avenue, on which are the chief hotels and some fine cottages, runs along a bluff beneath which is the beach. Further back are numerous elegant summer residences, while the old village, containing the permanent residents, is about a mile from the shore. The Monmouth Park race course is about 4 m. inland, near the railroad track. Long Branch contains 13 first-class hotels, with accommodations for more than 5,000 guests, the largest one alone accommodating 1,200; a bank, a weekly newspaper (issuing a daily edition during the season), and five churches: Episcopal, Methodist, Reformed (two), and Roman Catholic. It is incorporated, and governed by six commissioners.

**LONGCHAMPS**, a promenade in the Bois de Boulogne of Paris, famous for its horse races, military reviews, and as a fashionable resort, especially during Passion week. It derives its name from a former abbey, at the N. end of the village of Boulogne, which courtiers and other fashionables attended in the 18th century, and which was destroyed in 1793.

**LONGET, François Achille**, a French physician, born in St. Germain-en-Laye in 1811, died in Bordeaux in June, 1871. He early showed a strong taste for physiological pursuits, and from 1838 was almost entirely devoted to them. He was particularly distinguished for his numerous original investigations on the nervous system, and for his extensive and complete though somewhat polemic reviews of the statements and opinions of other writers. His conclusions, however, were in general marked by great good judgment. He made various series of experiments on the manifestations and effects of electricity in connection with the nervous system; on the excitability and irritability of the nerves; on the recurrent sensibility of the anterior roots of the spinal nerves;

on the seat of the reflex act of respiration in the medulla oblongata; on the effects of the inhalation of ether on the nervous system; and on the voice and the production of musical sounds. He twice obtained the Montyon prize of physiology at the academy of sciences. He was member of the academy of medicine, officer of the legion of honor, and consulting physician to Napoleon III. For the last ten years of his life he was professor of physiology in the faculty of medicine in Paris. Besides important contributions to the *Annales médico-psychologiques*, of which he was one of the founders, and other periodicals, his works are: *Recherches expérimentales sur les fonctions des nerfs des muscles du larynx* (1841); *Recherches expérimentales sur l'irritabilité musculaire* (1841); *Recherches expérimentales sur les fonctions d'épiglotte* (1841); *Anatomie et physiologie du système nerveux* (2 vols. 8vo, 1842); *Expériences relatives à l'inhalation de l'éther sulfurique sur le système nerveux* (1849); *Traité de physiologie* (2 vols. 8vo, with plates, 1850-'61; 3d ed. revised and enlarged, 1868); *Nouvelles recherches relatives à l'action du suc gastrique*, &c. (1855); and *Mouvement circulaire de la matière dans les trois règnes* (1865).

**LONGEVITY.** See AGE.

**LONGFELLOW, Henry Wadsworth**, an American poet, born in Portland, Me., Feb. 27, 1807. He is the son of Stephen Longfellow, an eminent lawyer in that city. At the age of 14 he entered Bowdoin college, where he graduated in 1825. During his academic course he composed several of the best known of his earlier poems, among them the "Hymn of the Moravian Nuns," "The Spirit of Poetry," "Woods in Winter," and "Sunrise on the Hills." After leaving college he entered the office of his father for the purpose of studying law; but in 1826 he accepted an offer of the professorship of modern languages and literature in Bowdoin college, with the privilege of devoting some time to preliminary foreign study, and early in the year sailed for Europe. He remained abroad till 1829, studying successively in France, Spain, Italy, and Germany, and afterward discharged the duties of his professorship for five years. During this time he contributed to the "North American Review," and published his translation of the *Coplas de Manrique* and his "Outre-Mer." His shorter poems were already numerous at this period, though as yet no collection of them had been made. In 1835, on the resignation of Mr. George Ticknor, he was appointed professor of modern languages and belles-lettres in Harvard university; and before entering actively upon the duties of the office he again visited Europe, returning in 1836. He then assumed the professorship, which he held for 17 years, during which not only his official but his literary labors were remarkably uninterrupted and fruitful. The summer of 1842 was passed at Boppard on the Rhine. In 1854 he resigned, but continued to reside at Cambridge,

in the house formerly occupied by Washington. In 1868-'9 he revisited Europe, and was everywhere the recipient of marked honors, especially in England, where his works are perhaps more universally known and read than those of any other American author. During this journey the degree of D. C. L. was conferred upon him by Oxford university. He had already received the degree of LL. D. from Harvard in 1859, and that of D. C. L. from Cambridge, England, in 1868, besides a great number of academic and literary honors from nearly all the leading institutions of America. Mr. Longfellow's works are as follows, not including in the list the many forms and sometimes the slightly different titles under which collections of his poems have been published: "Coplas de Manrique," a translation (Boston, 1833); "Oltre-Mer, a Pilgrimage beyond the Sea" (1835); "Hyperion" (1839); "Voices of the Night, and other Poems" (1839); "Ballads and other Poems" (1841); "Poems on Slavery" (1842); "The Spanish Student" (1843); "Poets and Poetry of Europe," a collection with criticism (1845); "The Belfry of Bruges, and other Poems" (1846); "Evangeline" (1847); "Kavanagh, a Tale" (1849); "Seaside and Fireside" (1850); "The Golden Legend" (1851); "The Song of Hiawatha" (1855); "The Courtship of Miles Standish" (1858); "Tales of a Wayside Inn" (1863); "Flower-de-Luce" (1867); "The New England Tragedies" (1868); "The Divine Tragedy" (1872); and a collection of his later poems under the title of "Aftermath" (1874). "The Golden Legend," "The New England Tragedies," and "The Divine Tragedy" have recently been united in a volume under the title "Christus." One of the most remarkable works of his later years has been his translation of Dante's *Divina Commedia* into English verse (3 vols., 1867-'70).—As a translator, Mr. Longfellow is singularly happy in transfusing not only the ideas but the spirit of his originals into apt and expressive diction; as a critic, whether commenting on character or literature, he is the genial interpreter rather than the censorious judge; and as a poet, he appeals to the universal affections of humanity, and expresses with the most delicate beauty thoughts which find sympathy in all minds. Averse to everything harsh, bitter, disdainful, or repellent, there is no element in his poetry to call forth an ungracious or discordant emotion. It is always tolerant and human, kindled by wide sympathies, and with a tender sense of every variety of human condition. He combines in a rare degree the sentiment of the artist with the practical instincts of the man of the world. His thoughts are uniformly lucid and transparent, and never clouded by fanciful verbiage or obscurity. The clearness, simplicity, and force of his leading conceptions leave the impression of unity even on his longest poems. However vivid his imagery, it never seduces the attention from his main

idea. Without attempting to represent the depths of passion, in his own sphere of feeling he is a genuine master, and the purity, sweetness, and refinement with which he delineates the affections of the heart, make him the most welcome of visitants at the fireside. Though not destitute of the creative faculty, the best expression of his imagination is perhaps to be found in the subtle essence of beauty which pervades his writings, and seems to form the natural atmosphere of his mind. Many of his poems have been translated into several languages. His latest poem, "The Hanging of the Crane," was published toward the end of 1874.

**LONGFORD**, a central county of Ireland, in the N. W. extremity of the province of Leinster, bordering on Leitrim, Cavan, Westmeath, and Roscommon, from which it is separated by the Shannon and Lough Ree; area, 401 sq. m.; pop. in 1871, 64,408. The principal lake is Lough Gowna. The surface is generally flat, but hilly in the north. The river Inny flows through the S. E. portion into Lough Ree. The soil is rich, underlaid by limestone and clay slate. There are valuable ores of iron and lead, but unwrought. A gray marble is quarried near Ballymahon. Grazing farms are numerous, and large quantities of butter are made. Linens and coarse woollens are manufactured.—**LONGFORD**, the capital (pop. in 1871, 4,375), on the Camlin river and at the terminus of the Royal canal, 68 m. W. N. W. of Dublin, has a fine Roman Catholic cathedral and an active trade.

**LONGHI, Giuseppe**, an Italian engraver, born at Monza, near Milan, Oct. 13, 1766, died in Milan, Jan. 2, 1831. He studied at the school of engraving in Milan, succeeded Vangelisti as professor in 1798, and for several years was at the head of the school. In 1801 he was called by Bonaparte to take part in the Cisalpine council at Lyons, from whence he went to Paris. Among his principal works are the "Vision of Ezekiel," after Raphael; the Magdalen of Correggio; the *Madonna del lago*, after Leonardo da Vinci; and "Galatea," after Albano. He also engraved fine heads of Napoleon, Washington, Michel Angelo, the doge Dandolo of Venice, and others. Among his masterpieces were the plates known as the *Fasti di Napoleone il Grande*, after the designs of Appiani. His biography was published by Sacchi in 1831, and by Baretta in 1837.

**LONGINUS, Dionysius Cassius**, a Greek critic, born in Athens, or at Emesa in Syria, about A. D. 213, executed at Palmyra in 273. He studied under his uncle Phronto of Emesa, a teacher of rhetoric at Athens, visited many countries, heard the lectures of the philosophers Ammonius Saccas and Origen, made himself familiar with the works of Plato, and opened a school of philosophy, criticism, and rhetoric at Athens. He subsequently removed to the East, and having been invited to the court of Zenobia, queen of Palmyra, he became not only her literary instructor, but also her

principal political counsellor. Zenobia was desirous of throwing off the Roman yoke, and making good her right to supreme sovereignty by force of arms. Longinus encouraged and advised her, and on the capture of Palmyra was put to death by order of the emperor Aurelian. He was the ablest philosophical writer of his age. The doctrine of the universal influence of soil and climate on the intellectual capacities and on the civilization of mankind is especially due to him. The only important fragment of his voluminous works now extant is a portion of his celebrated treatise "On the Sublime." The first edition of this fragment is that of Robortello (Basel, 1554), the best that of Morus (Leipsic, 1769-73). It has been translated into English by William Smith (London, 1739). Complete editions of all his extant writings were published at Leipsic in 1809, at Oxford in 1820, and at Paris in 1837.

**LONG ISLAND**, an island comprising Kings, Queens, and Suffolk counties, New York, situated between lat.  $40^{\circ} 33'$  and  $41^{\circ} 10' N.$ , and lon.  $71^{\circ} 51'$  and  $74^{\circ} 2' W.$ ; extreme length E. and W., 115 m.; extreme width, 23 m.; average width, about 14 m.; area, 1,682 sq. m. It is bounded N. by Long Island sound, E. and S. by the Atlantic ocean, and W. and N. W. by the Narrows, New York bay, and the East river, connecting the ocean with the sound. The sound through the greater part of its extent separates it from Connecticut, and the East river from New York city. Several small islands which lie in the adjacent waters are attached to it politically, among which the principal are Shelter, Gardiner's, Fisher's, and Plum islands. The population in 1870 was 540,648, of whom all but 144,549 resided in the city of Brooklyn. The coast is deeply indented with numerous bays and inlets, abounding with shell and other fish. A large deep bay, divided into Gardiner's bay, Little Peconic, and Great Peconic, extends inland 30 m., and divides the E. end of the island into two distinct parts, the northern terminating at Oyster Pond point, and the southern at Montauk point, about 20 m. further E. Along the S. border is a remarkable bay nearly 100 m. long and from 2 to 5 m. broad, formed by the Great South beach, a narrow strip of fine white sand from  $\frac{1}{2}$  m. to 1 m. wide, with occasional openings to the ocean. Jamaica, Hempstead, Oyster, and Huntington bays are toward the W. end of the island. The coasts of Long Island have been provided by government with an excellent system of lighthouses, and life-saving stations have been established provided with proper facilities for affording aid to vessels in distress. Though much diversified, the surface presents no great elevations. A ridge of hills extends, with occasional interruptions, from the N. boundary of New Utrecht in the west nearly to the extreme end of the northernmost eastern branch of the island. The highest of these are Harbor hill,

at the head of Hempstead harbor, and Jane's hill, one of the West hills in the town of Huntington. A number of spurs known under various names proceed from the main range. To the north of these hills the surface is generally uneven and broken; to the south remarkably level, with a gradual inclination toward the sea. There are several large tracts of apparently infertile plains, portions of which, however, by the application of suitable manures, have been put under profitable cultivation. The island, which has always been abundantly supplied with wood, still contains considerable forests. The great pine plains commence about 40 m. from the W. end, and continue almost uninterruptedly for about 50 m., occupying for that extent nearly one half of the island. There are many springs and small streams; the largest of the latter, the Peconic, flows into Great Peconic bay after a course of 15 m., in which it furnishes numerous mill seats. Fine natural ponds or lakes abound, and many swamps and marshes are scattered over the surface. Of salt marsh the island is computed to contain 116 sq. m. The soil is generally very fertile and under a high state of cultivation, a large portion of the agricultural industry being engaged in providing vegetables for the New York market. The climate, owing to the influence of the sea, is more temperate than in the same latitude in the interior, the thermometer seldom falling below zero or rising above  $90^{\circ}$ , the mean temperature being about  $51^{\circ}$ . There are many public resorts on the island for fishing, bathing, and summer residence. The E. portion forms the customs district of Sag Harbor. Here the whale fishery was formerly extensively carried on, but it is nearly extinct. The menhaden fishery is now an important branch of industry, and cod and mackerel fishing are pursued to some extent. The island is well supplied with railroads, the principal lines being the Long Island, which extends nearly the whole length, the South Side, and the Flushing and North Side.—When first discovered Long island was inhabited by 13 tribes of Indians, of whom there now remain but about 200 individuals, mixed with negro blood, and retaining no knowledge of their ancient language. The date of the first settlement by whites has been variously stated. It was commonly supposed to have taken place as early as 1625, but more recent investigations prove this not to have been the case. Stiles in his "History of the City of Brooklyn" indicates 1636 as the date, but a minute of the Dutch council, a translation of which is given in an appendix, shows that settlements began to be made in 1632. These settlements were at the W. end, and under the authority of the Dutch; the E. portion was first settled in 1640 by the English. Its name, which it received from the Dutch, was changed by the colonial legislature to that of the island of Nassau, which was never adopted by the people. The E. extremity was



claimed by the colonies of New England, and became the subject of frequent disputes until the final extinction of the Dutch authority by the English.—During the troubles which preceded the revolution the inhabitants of Long Island manifested a strong spirit of patriotism; but the reverses of the American arms suppressed the active coöperation of the people in behalf of independence. After the evacuation of Boston by the British, strenuous efforts were made by Washington to fortify the city of New York and its approaches. Gen. Greene was intrusted with the defence of Long Island, and constructed a line of intrenchments and redoubts from Wallabout bay to Gowanus cove, about a mile from the village of Brooklyn. The main works at the former end were on the hill afterward known as Fort Greene, on which the ditch and embankment still existed some years since, but which has been converted into an ornamental ground under the name of Washington park; on the other extremity, a battery was erected at Red Hook, and a fort on Governor's island, nearly opposite. About 2½ m. from the intrenchments, between them and the S. side of the island, was a range of hills, then densely wooded, and crossed by three roads: one, on the right of the works, passing near the Narrows to Gravesend bay, the central one through Flatbush, and the third far to the left through Bedford to Jamaica. Much confusion was created by Gen. Greene falling sick, and the command devolving upon Gen. Sullivan, then just returned from Lake Champlain, and unacquainted with the ground and with Greene's plans. On Aug. 22, 1776, the British landed 9,000 strong at New Utrecht, on Gravesend bay, without resistance. They were commanded by Sir Henry Clinton, assisted by Lords Cornwallis and Percy, Gen. Grant, and Sir William Erskine. Cornwallis, rapidly advancing to the central pass, found it occupied by the rifle regiment of Col. Hand, and, unwilling to risk an encounter, took post at Flatbush. On the 24th Washington visited the American lines, and appointed Gen. Putnam to their command. On the 25th the British were reënforced by two Hessian brigades under Gen. De Heister, and on the 26th began to carry out their plan of operations, which was to menace the first two passes mentioned, while Sir Henry Clinton with a body of chosen troops was to take possession of the road leading from Jamaica to Bedford. While the works were strengthened and other preparations made to resist attack, the pass by Bedford had been neglected, and only visited by an occasional patrol, who on this night failed to discover the approach of the enemy. Gen. Clinton, accompanied by Gen. Howe, the commander-in-chief, and by Lords Percy and Cornwallis, secured the defile and took possession of the heights without molestation or discovery, being guided by a tory of the neighborhood. The advance of Gen. Grant with the left wing

along the road by Gravesend and the Narrows was resisted by Col. Atlee with a guard of Pennsylvania and New York militia. Atlee retired fighting until he had fallen back upon Lord Stirling, who with two regiments had hastened to his relief. Here active firing was kept up by both sides without an attempt at a general action. At the same time De Heister opened a cannonade from Flatbush upon Col. Hand and his riflemen, but without offering to advance, and the guns of the British men-of-war were brought to bear upon the battery at Red Hook. These, however, were mere diversions. Clinton having descended the pass opened his guns on the Americans, and at this signal of his success De Heister ordered the redoubt, of which Gen. Sullivan had taken the command, to be stormed; but the latter, who found his left flank engaged and himself in hazard of being surrounded, ordered a retreat, not soon enough however to escape the light infantry of the British, who drove him back upon De Heister. The Americans still fought bravely, a large body cutting their way through to the intrenchments, the rest who were not killed either escaping among the hills or surrendering as prisoners. Among the latter was Gen. Sullivan. On hearing the cannonade of Clinton, Stirling, who had maintained his position in front of Grant, endeavored to return to the lines, but found himself cut off by Cornwallis. He attacked the enemy with such determination that the British held their ground only by the assistance of reënforcements, until Stirling, seeing no further hope, surrendered. The enemy, having forced all the approaches, were now before the American works, and soon proceeded to intrench themselves and plant their batteries. With this formidable force before him, and with indications that the British fleet intended moving up the river so as to cut the force in Brooklyn entirely off, Washington, who was now in personal command, determined to recross with the American army. This retreat was effected on the night of the 29th with complete success. Long Island from this time until the close of the war remained in the possession of the British. The whigs were subjected to much ill usage, and a partisan warfare between the tories and the whigs from Connecticut was kept up during the greater part of that period.

**LONG ISLAND CITY**, a city of Queens co., New York, at the W. end of Long Island, opposite the upper part of New York city; pop. in 1874, about 16,000. It extends 3 m. E. and W. by 5 m. N. and S., and has a water front of 10 m., stretching along Newtown creek on the south, which separates it from Brooklyn, and thence N. along East river to Bowery bay. It is divided into five wards, and contains three post offices: Astoria in the north, Ravenswood in the central portion, and Long Island City in the south. The S. W. portion is also called Hunter's Point. The N. portion is high and finely situated, and in Astoria and Ravens-

wood there are many beautiful drives and handsome residences. The plan has been liberally projected, with wide streets and avenues and three parks, but the actual laying out of the city has not advanced far. A handsome brick court house, to cost \$200,000, is in course of erection, and when it is completed the county seat of Queens co. will be removed to this place. Two ferries ply between Hunter's Point and New York, and Astoria is connected with that city by ferry and by the Harlem and Morrisania boats. Four lines of horse cars run to various parts of the city and to Brooklyn. Hunter's Point is the terminus of the Long Island, Flushing and North Side, and Central railroads, and contains the freight depot of the South Side line. It is the great depot for the storage and shipment of refined petroleum consigned to the New York market, and contains extensive lumber yards, a marine railway, three or four oil refineries, granite works, and manufactories of cabinet ware, varnish, chemicals, refrigerators, hammers, boilers and steam engines, asbestos roofing, mattresses, tinware, &c. A very extensive manufactory of pianofortes has recently been erected at Astoria, where there are also manufactories of carriages, carpets, and jewelry. The city has five ward school houses, a daily and five weekly newspapers, a Baptist and a Methodist mission, and 14 churches, viz.: Baptist, Episcopal (4), Methodist (3), Presbyterian, Reformed, and Roman Catholic (4). It was formed from a portion of the town of Newtown, and was incorporated by the act of May 6, 1870.

**LONG ISLAND SOUND**, a large body of water lying between Long Island and New York and Connecticut, about 110 m. long, and varying from 2 to 20 m. in width. On the west it is connected with the Atlantic by a strait called the East river, New York bay, and the Narrows, and on the east by a narrow passage called the Race. The principal rivers flowing into the sound from the mainland are the Housatonic, Connecticut, and Thames. It is in the route of a very large and important trade between the city of New York and the eastern states, and is navigated by many regular lines of packets and steamers. There are numerous lighthouses on its coasts.

**LONGITUDE**, in geography, an arc of the equator included between the meridian of a place and the meridian whence the degrees are counted, which is usually called the first meridian. The ancient geographers drew the first meridian through Ferro, the westernmost of the Canary islands, and they are still followed by the geographers of Germany and eastern Europe (who draw it, however, a little E. of the island). The English call the first meridian that which passes through Greenwich; the French, that of Paris; the Spaniards, that of Madrid. The inhabitants of the United States generally use Greenwich, though the longitude from Washington is also used.—An easy method of ascertaining the longitude at sea had been

wanted since the improvements in navigation, and after the improvement of the quadrant by Hadley and Godfrey it was the thing most desired to make navigation perfect. When deduced from the course and the distance, as was then the custom, the mariner had but little trust in his own work; and as late as 1820 vessels at sea on speaking each other never omitted the inquiry, "What is your longitude?" a common sympathy also causing them on "heaving in sight" to steer toward each other. Almost every method of determining the longitude depends on the obtaining the difference of time between your first meridian and that which passes through the place where you are; the time at the latter can be easily obtained by means of altitudes of the sun or other heavenly bodies, but the great difficulty is to find the time elsewhere, the difference of time being one hour to 15° of longitude. John Werner was the first to recommend the use of lunar distances for this purpose (1514); but at that time there were neither lunar tables nor instruments for measuring the distance between the moon and a star. Gemma Frisius was the first to suggest the use of timekeepers (1580), but the art of watch-making was then in its infancy. The great importance to navigation of determining the longitude induced various governments to offer rewards for some practical method. Spain offered 1,000 crowns for its solution as early as 1598, and the states of Holland soon after 10,000 florins; but it was not till 1714 that encouragement was offered in Great Britain, when an act was passed in parliament allowing £2,000 toward making experiments, and offering a reward to the person who should discover the best means of determining the longitude at sea, proportioned to the degree of accuracy that might be attained by such discovery. The result was the invention by John Harrison and the gradual perfection of the chronometer, which is now in general use, and to which alone we are indebted for the shortening of passages at sea, as by its use vessels can steer as direct for port as the ocean and winds will allow without fear of falling to leeward as formerly. (See CLOCKS AND WATCHES, and HARRISON, JOHN.) When the final award was made to Mr. Harrison, the acts concerning longitude were repealed, except so much as related to the publishing of the nautical almanac and other useful tables. It was also enacted that any person who should discover a method for finding the longitude by means of a timekeeper the principles of which had not previously been made public, should be entitled to a reward of £5,000, if after certain trials made by the commissioners the said method should enable a ship to keep her longitude during a voyage of six months within 60 geographical miles or a degree of a great circle, of £7,500 if within 40 geographical miles, and of £10,000 if within 30 geographical miles. If the method be by improved astronomical tables, the author becomes entitled to £5,000 when

they show the distance of the moon from the sun and stars within 15" of a degree, answering to about 7' of longitude, after allowing half a degree for errors of observation and under certain restrictions, and after comparison with astronomical observations for a period of 18½ years, during which the lunar irregularities are supposed to be completed. The same rewards were likewise offered to any person who should discover any other method of determining the longitude at sea with the accuracy above mentioned. At that period timekeepers were expensive and less to be depended on than at the present day; they could easily be consulted, but prudent mariners were cautious, and the motion of the heavenly bodies was more to be trusted. The eclipses of Jupiter's satellites, although answering well on land for determining longitude, could not be observed at sea on account of the ship's motion, and the more practical method of observing lunar distances for this purpose was adopted. Dr. Maskelyne, the astronomer royal, being the first to introduce them into use. The difficulties which had attended this method when first suggested were now removed. Prof. Mayer of Göttingen had formed lunar tables sufficiently correct to induce the commissioners of longitude to promote their practical application by the annual publication of the nautical almanac, commencing in 1767, and proper instruments for observing lunar distances had come into general use. The method of ascertaining the longitude at sea by lunar observations was followed until the great perfection with which chronometers were made caused it to be neglected.—The last discovered and most accurate of all methods of determining differences of longitude is by the use of the electro-magnetic telegraph. Captain (afterward Admiral) Charles Wilkes, of the United States navy, is entitled to the credit of having made the first attempt in that way, soon after the wires were placed between Washington and Baltimore; since that time the method of recording transits on a chronographic register by means of a galvanic circuit has been introduced, and in connection with telegraphic wires enables remote observers to record transits of the heavenly bodies simultaneously and with a degree of accuracy almost incredible. This method is called in Europe the American, but it may with greater propriety be called the United States coast survey method, as it had its origin and was perfected in that service. The application of this method has been also extremely important as a means of testing the correctness of the various astronomical methods which have been used, or may still have to be used, for regions with which telegraphic communication is impossible or inconvenient. Prof. Asaph Hall of Washington makes the following remarks on this important subject: "The method of defining longitudes by moon culminations is so simple in theory and so easy of application, that when only an approximate value of the longitude is desired, this method

will often be applied. In case, however, we wish an accurate determination of a geographical position, such as may be necessary for a station occupied in observing the transit of Venus, it is well that we should not over-estimate the accuracy of this method. In many of the estimates that have been made we have an illustration of the existence of constant errors which render such estimates of accuracy wholly illusory. . . . In nearly all the determinations of longitude by moon culminations, where a large number of culminations have been observed, the computed probable error of the result is only a small fraction of a second; but the telegraphic determination of the same points shows errors in the old determinations of two, three, and even four seconds of time. Thus the longitude of San Francisco, determined from 206 moon culminations, was found to be four seconds in error. The most decisive experiment on this point is, however, the determination of longitude between Europe and America. The three determinations of longitude between Greenwich and Washington by the United States coast survey, by means of the Atlantic cable, give the difference of longitude 5 h. 8 m. 12.2 s. The following are the determinations of the same difference of longitude by moon culminations:

AUTHORITIES.	No. culm.	Longitude.
Loomis .....	150	5h. 8m. 9.3s.
Gillis .....	394	5 8 10.0
Walker .....	...	5 8 9.6
Newcomb .....	279	5 8 11.6
Newcomb .....	163	5 8 9.8

showing errors —2.9 s., —2.2 s., —2.6., —0.6 s., and —2.4 s. In his last determination, Prof. Newcomb used the observations of 1862 and 1863, when the transits both at Greenwich and Washington were recorded by the chronographic method. It seems therefore fair to conclude that a longitude determined by moon culminations may be in error two or three seconds, even if we could use an infinite number of observations."

**LANGLAND, Robert.** See **LANGLAND.**

**LONGMAN. I. Thomas,** an English publisher, born in Bristol in 1699, died in London, June 18, 1755. In 1716 he was apprenticed to John Osborn, a stationer and bookseller of London, with whom he entered into partnership in 1725, in Paternoster row, in the place still occupied in the same business by his successors. The chief publications in which he was concerned were Chambers's "Cyclopædia of Arts and Sciences," the precursor of the different cyclopædias which have since appeared in Europe and America, and Johnson's "Dictionary," of which latter work he was one of the six original proprietors. **II. Thomas,** nephew of the preceding, born in London in 1731, died at Hampstead, Feb. 5, 1797. He was taken into partnership by his uncle in 1754, and subsequently entered into partnership with Mr. Rees,

with whom he published a new edition of the "Cyclopædia." He was one of the first to export books to America. **III. Thomas Norton**, son of the preceding, born in London in 1771, died at Hampstead, Aug. 28; 1842. He became a partner with his father about 1792, the firm being then one of the largest in the city, both as publishers and booksellers, and during the 50 years that he remained connected with it greatly extended its operations and enhanced its reputation. Various partners were from time to time admitted into the house, but during nearly the whole of the period above indicated Thomas Norton Longman remained at its head. At the commencement of the present century the Longmans were the proprietors of the valuable copyright of Lindley Murray's "English Grammar," and issued some of the first poems of Wordsworth, Coleridge, and Southey. They also published Scott's "Lay of the Last Minstrel" and several of the Waverley novels, and subsequent to 1811 were the exclusive publishers of Thomas Moore's works, with the exception of his "Life of Lord Byron," the works of Herschel, Mackintosh, Macaulay, McCulloch, and others. In 1826 they became part proprietors of the "Edinburgh Review," and between 1829 and 1846 published the 133 volumes of Lardner's "Cabinet Cyclopædia." Another important enterprise of the house was the reconstruction of the old Chambers's "Cyclopædia," which, under the editorship of Dr. Abraham Rees, was expanded into a work in 39 vols. 4to, with 6 vols. of plates, and styled "Rees's Cyclopædia" (1802-'19). Mr. Longman's sons, THOMAS and WILLIAM, succeeded him in the firm, which is now, under the style of Longmans, Green, Reader, and Dyer, one of the largest publishing houses in England.

#### LONGOBARDS. See LOMBARDY.

**LONGSTREET, James**, an American soldier, born in South Carolina about 1820. He was taken to Alabama in his childhood, graduated at West Point in 1842, and was assigned to the infantry. He served in the principal battles of the Mexican war, was severely wounded in the assault on a fortified convent at Chapultepec, and was successively brevetted as captain and major. From 1847 to 1858 he was on frontier duty in Texas, having been made captain of infantry in 1852. In 1858 he became paymaster, with the rank of major of staff, at Albuquerque, New Mexico. In June, 1861, he resigned and entered the confederate service, and became a brigadier general under Beauregard. His brigade took an active part in the first battle of Bull Run (July 21, 1861), after which he was made major general. He commanded the rear guard at the abandonment of Yorktown, and fought the battle of Williamsburg (May 5, 1862), which enabled the confederates to effect their retreat to Richmond. At the battle of Seven Pines (May 31) Longstreet's division bore the main part, and gained whatever success was achieved. During the "seven days" his division was closely en-

gaged in the battles of Cold Harbor (June 27) and Frazier's Farm (June 30). Of the 10,000 men in this division the loss in killed and wounded was 4,292. Shortly after the confederate army of northern Virginia was organized into two corps, under the immediate command of Jackson and Longstreet, to operate against the Union army of Virginia under Pope. At the second battle of Bull Run Longstreet, with whom was Lee, joined Jackson on the second day (Aug. 30) in time to secure the victory. In the invasion of Maryland which ensued, Longstreet's corps bore an important part in the battles of South Mountain and Antietam. At the battle of Fredericksburg (Dec. 13) Longstreet commanded the confederate left, where the main success of the day was achieved. In February, 1863, Longstreet with two of his five divisions was detached for special service in North Carolina, but was recalled to Virginia immediately after the battle of Chancellorsville, was made lieutenant general, and received command of one of the three corps of the army destined for the invasion of the north. At Gettysburg portions of his corps, though not under his immediate orders, fought the indecisive action of July 2, and the fatal one of July 3. During the partial lull of operations in the east which followed this battle Longstreet with his division was sent to the west to the support of Bragg. He arrived in Tennessee just in time to secure the confederate success at Chickamauga (Sept. 19, 20). Early in November Longstreet was sent by Bragg to operate against Burnside near Knoxville. This movement proved unsuccessful, and in March, 1864, Longstreet with his division rejoined the army of Lee. At the battle of the Wilderness, May 6, 1864, Longstreet was severely wounded by his own men, who mistook him for a Union officer, and did not resume service till October. He was then placed in command of the forces on the east side of the James river. He took part with a few brigades in the final engagement at Petersburg, which enabled Lee to secure his retreat from that city. He was a member of the last council of war held by Lee in the woods on the night of April 8, 1865. After the conclusion of the war Longstreet was among the first of the confederate generals to avail himself of the proffered amnesty. He took up his residence in New Orleans, engaged in civil pursuits, and exerted himself to bring about a cordial peace, acting with the republican party. For a time he was surveyor of the port, and in 1874 was one of the school commissioners of New Orleans.

**LONGSTREET. I. William**, an American inventor, born in New Jersey about 1760, died in Georgia in 1814. He early removed to Georgia, and in 1790 wrote a letter to Thomas Telfair of Savannah asking his assistance in raising the means to construct a boat to be propelled by steam. This letter was published in the Savannah and Augusta newspapers; the necessary funds were subsequently furnished,

and he constructed a small model boat, upon a plan very different from Fulton's, which went on the Savannah river against the stream at the rate of five miles an hour. Cotton had previously been ginned by two rollers, not quite one inch in diameter, which caught the fibres, pressed out the seed, and delivered the clean cotton on the other side, where it was taken by the ginner's hand, and deposited in a bag attached to his person. Longstreet invented and patented the "breast roller," moved by horse power, which entirely superseded the old method. He set up two of his gins in Augusta, which were propelled by steam and worked admirably; but they were destroyed by fire within a week. He next erected a set of steam mills near St. Mary's, Ga., which were destroyed by the British in the war of 1812. These disasters exhausted his resources and discouraged his enterprise, though he was confident that steam would soon supersede all other motive powers. **II. Augustus Baldwin**, an American author, son of the preceding, born in Augusta, Ga., Sept. 22, 1790, died at Oxford, Miss., Sept. 9, 1870. He graduated at Yale college in 1813, studied law at Litchfield, Conn., and in 1815 was admitted to the bar in Georgia. In 1821 he was elected to the legislature, in 1822 became judge of the superior court of Georgia, and in 1824 was a candidate for congress. But the death of one of his children turning his thoughts to religious subjects, he withdrew from the canvass, declined a reelection to the bench, resumed his practice at the bar for several years, and in the mean while prepared himself for the ministry. In 1838 he became a minister in the Methodist Episcopal church, and was stationed at Augusta, Ga. In 1839 he was elected president of Emory college, Georgia, where he remained till 1848, when he became president of Centenary college, Louisiana, and soon afterward of Mississippi university, and in 1857 of South Carolina college, a post which he held until the outbreak of the civil war. He commenced writing for the press at an early age, and was a frequent contributor to periodical literature. Several of his addresses and sermons have been published; but he is best known as a humorous writer. About 1858 he wrote a serial novel, "Master William Mitten, or a Youth of Brilliant Talents who was ruined by Bad Luck." His "Georgia Scenes in the first Half Century of the Republic," a series of newspaper sketches continued for several years, was collected (2 vols., New York, 1840; revised and enlarged, 1 vol., 1867).

**LONGTON**, a market and manufacturing town of Staffordshire, England, 32 m. S. of Manchester; pop. in 1871, 19,748. It is on the North Staffordshire railway, and contains several fine streets, two parish churches, and other places of worship. There are two large market halls, a town hall, an athênæum, and a mechanics' institute. It has extensive manufacturing of china and earthenware.

**LONGUEVILLE, Anne Geneviève de Bourbon**, duchess de, a French politician, born Aug. 29, 1619, died April 15, 1679. Her father, Henri II., prince of Condé, was prisoner in the château of Vincennes at the time of her birth. The great Condé and the prince of Conti were her brothers. Her mother, a member of the Montmorency family, imparted to her strong sentiments of piety, but her education was neglected. When she yielded to the request of her friends and attended a court ball, her beauty created a sensation which tempted her to become a regular habituée of the royal circle. The prince de Joinville, to whom she had been betrothed, having died, she was in 1642 prevailed upon to bestow her hand upon the duke de Longueville, a widower who was double her age, and whose former mistress, Mme. de Montbazon, caused great annoyance to the duchess by accusing her of a love intrigue with Coligni, for which at that time there does not seem to have been any foundation. The duke was sent to Münster in 1645. During his absence from Paris, the duchess occasionally saw the prince of Marsillac, afterward duke de La Rochefoucauld; and it being reported that she was not indifferent to his attentions, the duke de Longueville caused his wife to join him in Westphalia, where she remained till 1647, following with interest the negotiations of the treaty of peace of Münster, and imbibing a fondness for politics, which on her return to Paris she displayed most actively in the part which she took in the Fronde. La Rochefoucauld was one of its chief leaders, and she threw herself with impetuosity into the movement. Among others who joined it were her brother Conti and the duke de Bouillon; but as it was intimated that they were both wavering in their revolutionary zeal, Mme. de Longueville was detained in the hôtel de ville as hostage for her brother, and Mme. de Bouillon for her husband. While there, in the night of Jan. 26, 1649, the duchess gave birth to a son, of whom La Rochefoucauld was supposed to be the father. In order to punish the duchess, her brothers and husband were arrested by order of Anne of Austria, the regent, in 1650. Mme. de Longueville left Paris on the night of the arrest for Normandy, where she hoped to inspire a rising; but failing, and barely escaping with her life on her flight from Dieppe, she gained Rotterdam and repaired to the citadel of Stenay on the Meuse, of which she took the command, and succeeded in inducing Turenne, whom she met there, to join the Fronde and accept the assistance of the king of Spain in levying troops against France. After the conclusion of this alliance, she published a letter to the king, accusing Mazarin, and throwing upon him the responsibility for her course. Her husband and brother were set free in the beginning of 1651, when she went to Paris; but declining to follow her husband, who was firm in his loyalty to the king, into Normandy, she set out on a new revolutionary



expedition to Bordeaux, in company with La Rochefoucauld, the duke de Nemours, and her brothers Condé and Conti. Dissensions broke out between her and her younger brother. The citizens of Bordeaux opened negotiations with the duke de Vendôme, who was blockading it. A general amnesty was proclaimed in 1653, after which the duchess returned to private life. Afflicted by the loss of her mother (1650), and by the desertion of her lover, and baffled in her schemes against the court, she resolved to renounce the world. But after having spent some time in various convents, she was again attracted by the pleasures of society, and accepted an invitation of her husband to rejoin him in Normandy. The duke died in 1663, and the duchess now devoted herself almost entirely to a religious life. She was called the "mother of the church," and her influence in Rome was said to have secured for the Jansenists the so-called peace of Clement IX. (1668). The latter part of her life was darkened by the death of her son the duke de Longueville in battle (1672), and spent in the Carmelite convent of Paris in the most stringent observance of religious duties and in the practice of charity. Her death was even affirmed to have been either voluntary, or at all events hastened by the influence of an abstemious and penitential life upon her health. Cousin, in his interesting work on *Madame de Longueville* (Paris, 1853, often reprinted), calls her "the soul of the Fronde."

**LONGUS**, a Greek sophist, who is supposed to have lived about A. D. 400. Concerning his history nothing is known. He was the author of a pastoral romance entitled "The Pastorals of Daphnis and Chloe," of which the best editions are by Villoison (Paris, 1778) and Passow (Leipsic, 1811). Villemain, in his work *Sur les romans grecs*, compares Longus to Bernardin de St. Pierre.

**LONGWORTH**, Nicholas, an American horticulturist, born in Newark, N. J., Jan. 16, 1782, died in Cincinnati, Feb. 10, 1863. In his youth he was clerk in the store of an elder brother in South Carolina. At the age of 21 he emigrated to Cincinnati, where he studied law. Conceiving that Cincinnati was destined to be an important centre, he purchased considerable tracts of adjoining land, which have long since been covered by the rapidly increasing city. After about 25 years' practice he retired from professional life in order to devote himself to the cultivation of the grape, with a view of manufacturing wine, at first with little success, having used exclusively foreign vines. But about 1828 he commenced introducing native vines or their seedlings, and produced wine from two species, the Catawba and the Isabella, of a high marketable value. He had 200 acres of vineyards, besides a large wine house in the vicinity of Cincinnati. He was also favorably known by his experiments on the strawberry. At his death his property was estimated at nearly \$15,000,000. He published

"Buchanan's Treatise on the Grape, with an Appendix on Strawberry Culture" (1856).

**LONGWY**, a town and fortress of France, in the department of Meurthe-et-Moselle, situated on the Chiers, a tributary of the Meuse, 34 m. N. N. W. of Metz; pop. in 1866, 3,353. It is a fortress of the second class, is built on the side of a hill rising abruptly from the river, and is divided into the upper and the lower town. Longwy was founded in the 7th century, and was ceded to France in 1678. The fortifications of the upper town were planned by Vauban in 1682. It was taken by the Prussians in 1792, in 1815, and again on Jan. 25, 1871.

**LÖNNROT**, Elias, a Finnish philologist, born at Sammat, in the district of Helsingfors, April 9, 1802. He was the son of a tailor and learned his father's trade. After studying for a few months at the gymnasium of Borgo, he entered a druggist's shop in 1820, and in 1822 he was admitted to the university of Abo. He took the degree of M. D. in 1832, and was appointed a district physician. In 1853 he succeeded Castrén as professor of Finnish literature in the university of Helsingfors, a post which he still held in 1873. His literary labor has been mainly devoted to the collection of the songs and legends of Finland. (See FINLAND, vol. vii., p. 203.)

**LONGKE**, an E. central county of Arkansas, formed in 1873 from portions of Prairie and Pulaski cos. It is well watered, and the surface is diversified by hills, prairies, and bottom lands. Much of the soil is fertile, producing large crops of corn and cotton. It is traversed by the Cairo and Fulton and the Memphis and Little Rock railroads. Capital, Lonoke.

**LONS-LE-SAULNIER**, a town of Franche-Comté, France, capital of the department of Jura, on the Seille, 69 m. N. E. of Lyons; pop. in 1866, 9,943. It has a communal college, a tribunal of commerce, a public library, a museum, two very ancient churches, and a salt spring discovered in the 4th century, to which it owes its surname (Lat. *Salinarius*), and from which much salt is produced. The principal manufactures are hosiery and bonnets.

**LOO CHOO ISLANDS**, Liu Kiu, or Riu Kiu, a chain of islands in the N. Pacific, between lat. 24° and 29° N., and lon. 123° and 130° E. They are about 36 in number, besides many islets, and stretch from N. E. to S. W. between Japan and the island of Formosa. They contained in 1872 a population of 166,789. Okinawa, or Great Loo Choo, the principal island, is about 65 m. long. It extends N. E. and S. W., and is intersected by a range of hills attaining an elevation of 1,100 ft. The surface rock in the S. part of the island is argillaceous; further N. it is of talcose slate and granite. The surface is intersected by limestone dikes or ridges, which form a remarkable feature of the scenery, rising into peaks, which at a little distance look like castellated towers. The argillaceous rock is often broken into bare faces with perpendicular sides, over which at the heads of the

valleys waterfalls are sometimes precipitated. There are great masses of coral rocks even on the inland hilltops. The soil is variable, but the island abounds in grass and trees, and is picturesque and beautiful, the shores resembling the richest scenery of England. The heat is never excessive, though there are sometimes injurious droughts and typhoons. The land all belongs to the government, which lets it to large tenants, who sublet to small farmers. The system of cultivation is primitive; the implements are rude, and the soil is generally tilled by hand. Rice is one of the chief staples; among the other productions are sugar cane, wheat, cotton, barley, tobacco, millet, sago, and the watermelon, fig, peach, banana, and wild raspberry. Grass is not cultivated as a crop. The most abundant trees are the pine and banyan, which line the highways. The banyan is also used for hedges, and planted on the tops of the coral walls which surround the house, and pruned into symmetrical forms. Other trees are the vegetable ivory, ebony, mulberry, orange, lemon, and palm. The bamboo grows abundantly, and supplies food, clothing, shade, and building materials. The ferns are very fine, some of them being tree ferns. Fowls, ducks, geese, pigs, goats, and a small black ox abound, and there is a small but strong and active breed of horses. Wild boars are found in the forests, especially in the N. part of the island.—The people generally live in villages, which are embowered with arching lanes of bamboo, the tops of which interlace and form shady avenues. In the largest villages are buildings called *cung-quas*, neat wooden dwellings with tiled roofs and gardens, for the accommodation of the agents of the government in their official journeys through the island. The houses in the country are thatched with rice straw. The principal seaport is Napa, a town of considerable size, on a small island in the bay near the S. W. point of the island. Shuri, or Shoori, the capital and residence of the king, is a short distance inland from Napa; it is about a mile and a half in length, and contains a castle built of large blocks of limestone. Besides these there are about 40 other towns. The population consists of two races, the Japanese and the Loo Chooans proper, who are of the same stock, and greatly resemble each other, though the Loo Chooans are more effeminate and less intelligent. Unlike the Malays and Chinese, they have a full black beard. Their complexion is a dusky olive, the hair generally black, worn long at the sides and back, while the middle of the head is shaved bare, and the rest of the hair drawn into the vacant space, plaited into the form of a circular comb, and kept in place by two large hair pins, one of which has a star-shaped head of gold, silver, brass, lead, or pewter, according to the rank and wealth of the wearer. Their dress is a loose wide-sleeved robe, gathered at the waist with a girdle. The better classes wear white stockings

and straw sandals. The women, who are kept very secluded, dress much like the men, but do not shave the head. The books, learning, and religion are for the most part Chinese, and the higher classes are well instructed. The principal occupation is agriculture, but a coarse sugar, salt, saké (a beer brewed from rice), cotton and grass cloth, paper, pottery, and lacquered ware are manufactured. Rude paintings and sculptures are found among them, and the bridges, viaducts, and roads, and the citadel at Shuri, show some architectural skill. They appear to have no money of their own, but understand its use and value. They export some sugar and saké to Japan. The government is administered in the name of a king, and is in the hands of an aristocracy consisting, as in China, of the literary class, who appear to live in idleness, while the poor are greatly oppressed.—These islands are said by the Chinese to have been discovered under the Tsin dynasty, about A. D. 600. About 400 years ago the principal island was divided into three kingdoms, which subsequently were united and became tributary to China, and afterward to Japan. The island was visited by Capt. Basil Hall and Mr. McLeod in 1816, and in 1852 by Commodore Perry, who included Loo Choo in the treaty made with Japan.

**LOOKOUT, Cape.** See CAPE LOOKOUT.

**LOOM** (A. S. *loma*), a machine for weaving cloth. The loom is one of the oldest inventions, but among the ancients it was of exceedingly simple construction. That which is used at the present time by the natives of India is probably the most ancient form of the machine. The Indian loom consists of two horizontal rollers of bamboo, from one of which the yarn called the warp is drawn, while the woven fabric is wound upon the other. Each alternate thread is raised by a loop attached to a string connecting with a bar above, which being raised by the weaver moves half of the threads at once, leaving a space between them and the remainder for the passage of the woof, which may be effected by a long needle held in the hand or by a shuttle. The first set of alternate threads being now lowered, and the second set raised, the woof is passed back in the opposite direction, separated from the preceding thread of woof by the crossed threads of the warp; and thus the operation is continued. By means of this rude apparatus the natives of the East have made the finest of woven fabrics; but the great secret of their success lies in the perfect manner in which they spin and prepare their thread. The looms used by the ancient Egyptians, pictures of which are painted and sculptured upon some of their monuments, are of similar form to those of the Hindoos and Chinese; and the form was not very essentially varied in the looms used by western nations in their development toward modern civilization for several thousand years. The first step toward improvement appears to have been made by John

Kay of Bury, England, about 1740, by the application of a fly shuttle; but the most important advance was made by Dr. Cartwright in 1787, who, it is said, without ever having seen a loom, constructed one to work by machine power. (For the construction and use of modern looms, see **WEAVING**.)

**LOOMIS, Elias**, an American mathematician, born in Tolland co., Conn., in August, 1811. He graduated at Yale college in 1830, where he was tutor from 1833 to 1836. He was the first person in America to obtain a view of Halley's comet, at its return in August, 1835, and his observations on that body, with a computation of its orbit, were published in the "American Journal of Science." He also made a series of hourly observations on the declination of the magnetic needle, continued through more than a year. In 1836 he visited Europe, spending a year in Paris, where he attended the lectures of Poisson, Biot, Dulong, and Pouillet. Returning home in 1837, he became professor of natural philosophy in the Western Reserve college, Ohio. Here he made many astronomical and magnetic observations, and kept a full meteorological journal. The larger portion of his researches appear in 10 memoirs contributed to the "Transactions of the American Philosophical Society," vols. vii.-x. In 1844 he became professor of natural philosophy in the New York university, which office he retained till 1860. A portion of the time between 1845 and 1849 he was employed, under the direction of the superintendent of the coast survey, in determining the difference of longitude between New York and other cities, by means of the electric telegraph. In the course of these experiments the velocity of the electric current through telegraph wires was first determined. In 1860 he succeeded Prof. Olmsted as professor of natural philosophy in Yale college. His contributions to science relate for the most part to astronomy, magnetism, and meteorology. Besides the memoirs above referred to, some 30 or more papers of his have appeared in the "American Journal of Science;" one, on storms, in the "Smithsonian Contributions to Knowledge;" two astronomical papers in Gould's "Astronomical Journal;" and one or more yearly in the "Proceedings of the American Association for the Advancement of Science." He has also published the following works: "Plane and Spherical Trigonometry" (New York, 1848); "Progress of Astronomy" (1850 and 1856); "Analytical Geometry and Calculus," and "Elements of Algebra" (1851); "Elements of Geometry and Conic Sections" (1851 and 1871); "Tables of Logarithms" (1855); "Natural Philosophy" (1858); "Practical Astronomy" (1855 and 1865); "Elements of Arithmetic" (1863); "Treatise on Meteorology" (1868); "Elements of Astronomy" (1869); and "The Descendants of Joseph Loomis" (1870).

**LOON**, a web-footed bird. See **DIVER**.

**LOOSESTRIFE**. See **LYSIMACHIA**, and **LYTHRUM**.

**LOPE DE VEGA**. See **VEGA**.

**LOPEZ. I. Carlos Antonio**, president of Paraguay, born in Asuncion, Nov. 4, 1790, died there, Sept. 10, 1862. He received the best education attainable in the ecclesiastical seminary of Asuncion, and escaped the persecution of Dr. Francia, the dictator, only by hiding himself for many years in a remote village. On the death of Francia in September, 1840, he returned to Asuncion, when, being the only native of Paraguay having any knowledge of theories of government, he became the secretary of the military junta then exercising supreme power. In 1841 he was one of the two consuls elected for three years, and in 1844 the congress elected him president for ten years. In 1854 he was reelected for three years, and again in 1857 for seven years, with power to appoint his temporary successor by will. His government was arbitrary, but in general not oppressive or sanguinary. He gradually opened Paraguay to foreign trade and immigration, made treaties with several powers, laid the foundations of a formidable army, with suitable fortifications, arsenal, and flotilla, constructed a railway, and provided for the education of numerous youths in European mechanical and scientific schools. His extreme jealousy of all encroachments upon the independence of Paraguay brought him into conflict with the dictator Rosas of Buenos Ayres, and his dislike of foreigners involved him in diplomatic controversies with England, France, and Brazil, which in each case were carried to the verge of hostilities, from which he escaped by shrewd diplomacy. His treatment of the American consul, and the firing into the exploring steamer *Water Witch*, in 1855, led to a large American squadron being sent to enforce a demand for reparation, which was promised by a new treaty, but ultimately evaded. His long administration greatly advanced the material welfare of Paraguay, and the security of life and property was commensurate with the powers which he exercised, unlimited except by laws of his own enacting. **II. Francisco Solano**, president of Paraguay, son of the preceding, born near Asuncion, July 24, 1827, killed in battle, March 1, 1870. From an early period of his father's administration Francisco was intended as his successor, and he was appointed to the posts of greatest honor. In 1845 he was named commander-in-chief of the Paraguayan army, and spent some time on the frontier of Corrientes, nominally but not actually engaged in warfare with the dictator Rosas of Buenos Ayres. In 1854 he was sent with a numerous corps of attachés to exchange treaty ratifications with several European powers, and passed 18 months in Europe. While there he met an Irish lady who called herself Mrs. Lynch, and who lived apart from her husband, a French officer. She followed Lopez to Paraguay, and became his mistress, a position not deemed

discreditable in that country, where marriage had been almost abolished by Francia. By her talents she acquired popularity, and exercised a controlling influence over Lopez until near the end of his life. On his return he became minister of war, and thenceforth exercised great influence in the government, which he used chiefly for putting the country in readiness for a foreign war, as he had early conceived the project of wresting from Brazil, Bolivia, and the Argentine Republic their adjacent provinces. On the death of his father in 1862 it was found that Gen. Lopez had been designated by will as vice president, and congress chose him president for ten years from Oct. 16. The efforts of the new president were now energetically directed to warlike preparations, and for two years he was constantly but secretly receiving arms from Europe. In 1864 he believed himself prepared to cope with the combined forces of the adjoining nations. Skilfully availing himself of a Brazilian intervention in a civil war in Uruguay, he declared himself the protector of the "equilibrium" of the Plata river, and summoned the Brazilian forces to retire. No attention being paid to his protests, he commenced hostilities in November, 1864, by seizing a Brazilian mail steamer; and in December he seized upon the defenceless Brazilian province of Matto Grosso, lying on the upper waters of the river Paraguay. Early in 1865 he despatched 8,000 troops across the Argentine territory into the Brazilian province of Rio Grande do Sul, when the protests of the Argentine government against this violation of its territory afforded a pretext for declaring war upon that republic. A hastily summoned congress of his own selection ratified these acts, conferred the grade of marshal upon Lopez, gave him extraordinary war powers, and formally declared war against Brazil and the Argentine Republic. Before this declaration was known in Buenos Ayres, Lopez ordered the seizure of two Argentine men-of-war lying at anchor in Corrientes, and overran that province with his forces. The governments of Brazil, the Argentine Republic, and Uruguay thereupon concluded a secret treaty (May 1, 1865), forming an offensive and defensive alliance against Paraguay. In the course of this year the allies recovered the provinces occupied by Lopez, and in their turn invaded Paraguay early in 1866. For four years thenceforward a war of greater proportions than had hitherto been known in South America was waged with varying fortunes on the soil of Paraguay. On the part of Lopez all the able-bodied males between the ages of 12 and 70 were successively impressed into the service, and several lines of defence were gallantly maintained. In February, 1868, the Brazilian squadron forced its way above the fortresses, and bombarded Asuncion, the capital of Paraguay, which had however been evacuated by the government and all its inhabitants. As a consequence of some vacil-

lations on the part of the individuals composing this government as to their conduct toward the enemy in this unexpected emergency, Lopez suspected the vice president and cabinet ministers of disloyalty. He caused their imprisonment and removal to army headquarters, where they were tried before an improvised court consisting of three priests. By means of the most unrelenting tortures the prisoners were brought to confess themselves guilty and to implicate others, who were quickly seized and subjected to the same process. In the course of a few weeks confessions had been extorted which ultimately implicated all the civil employees left by Lopez in Asuncion, most of the foreign diplomatic and consular officers, and all the foreigners engaged in commerce, in sweeping charges of conspiracy against the rule or even the life of Lopez. More than 500 persons, embracing all that remained in Paraguay of intelligence, wealth, or official rank, were either executed or died by torture in the encampment of Lopez, during the second half of the year 1868. The American legation was involved in this charge. The minister escaped in September through the opportune arrival of an American gunboat, but two attachés were seized and subjected to the usual trial by torture. Their lives were spared, however, and they were ultimately surrendered to an American squadron in December. By successive defeats Lopez was driven to the extreme northern limits of Paraguay. When about to cross the river Aquidaban, he was surprised by a detachment of Brazilian cavalry. While attempting to swim to the opposite bank, the Brazilian general, Camara, in vain summoned him to surrender; but his strength gave way, and while bleeding from his wounds he was killed by two Brazilian soldiers, his last words being: "I die for my country." Mrs. Lynch was overtaken in her flight. The eldest son, Pancho, in the uniform of a colonel, fired upon the Brazilian chief lieutenant, Martinez, who thereupon killed him, and he was buried by the side of his father. Mrs. Lynch was allowed to go to England. The forces of Lopez, reduced to about 1,500, at once laid down their arms.—See "Seven Eventful Years in Paraguay," by G. F. Masterman (London, 1869), and "History of Paraguay," by C. A. Washburn (2 vols., Boston, 1870).

**LOPEZ, Narciso**, a Cuban revolutionist, born in Venezuela in 1799, garroted in Havana, Sept. 1, 1851. He was the son of a wealthy merchant, and at an early age sympathized with the national independence of South America, although he served for some time in the army of the king of Spain, from which he retired in 1822 with the rank of colonel. After the evacuation of Venezuela by the Spanish troops, he established himself in Cuba; and afterward going to Spain, he joined the constitutional party of Isabella against Don Carlos, and became successively adjutant of Gen. Valdes, governor of Madrid, and senator for Seville,

but resigned his offices after the refusal of the cortes to admit the representatives of Cuba. Valdes became governor general of that island, and Lopez on returning thither was employed by him in various capacities, and also turned his attention to the exploration of copper mines. He was soon attracted by the project of throwing off the yoke of Spain, and proceeded in 1849 to the United States, where he sunk almost his whole fortune in the organization of three successive expeditions to Cuba: the so-called Round island expedition in 1849, the invasion of Cardenas in May, 1850, both of which failed, and lastly the Bahia Honda expedition, which set out in August, 1851, and which ended fatally. Lopez, with several hundred persons of different nationalities whom he had enlisted in various parts of the United States, landed at Morillo, near Havana, where he left 200 of his men under the command of Col. Crittenden, who were soon taken by the Spaniards and shot. Lopez himself went to Las Pozas, where he succeeded in repelling an attack of the Spanish soldiers; but, isolated from his friends, he sought refuge in the mountains, where he was captured and taken to Havana. He was sentenced to death, which he met with great firmness.

**LOPHIODON** (Cuv.), an extinct tapir-like ungulated mammal, called *tapirotherium* by De Blainville, found in the eocene tertiary deposits of central Europe. The dental formula, according to Pictet, is: incisors  $\frac{3}{2}$ , canines  $\frac{1}{1}$ , and molars  $\frac{2}{2}$ . The dentition resembles that of the tapirs, and the generic name indicates the transverse ridges of the molars; but these are more oblique than in the tapirs, single in the anterior teeth, and triple in the posterior. Their remains are not found in the diluvium, pliocene, or miocene, but in the eocene freshwater strata. Of the eight species mentioned by Pictet, the largest is the *L. Isselense* (Cuv.), one third larger than the Indian tapir, and of the size of a small rhinoceros.

**LOPHOBANCHS**, an order of bony fishes, whose gills, instead of hanging in regular fringes, are disposed in tufts arranged in pairs along the branchial arches. The external skeleton resembles the armor of the ganoids, and they are placed by some as an order of this class; the body is almost fleshless, and the form is generally stiff and angular; the snout is elongated and tubular, the gill opening very small, and the air bladder without a duct. This order includes, among others, the genera *hippocampus* (Cuv.), *pegasus* (Linn.), and *syngnathus* (Linn.). Among the strange and beautiful forms in this order may be mentioned the *phyllopteryx* of the Australian seas, having the most exquisite red and purple tints, and adorned with numerous leaf-like appendages. In the mailed *pegasus*, with its spiny rings, the mouth opens at the base of the prolonged snout, as in the sturgeons. *Syngnathus* is noticed under PIPE FISH. One of the most curious peculiarities in this order is that the males

carry the eggs in ventral or caudal pouches until they are hatched. (See SEA HORSE.)

**LORAIN**, a N. county of Ohio, bordering on Lake Erie, drained by Black river and Beaver creek; area, 550 sq. m.; pop. in 1870, 30,308. The surface is level and the soil fertile. It is intersected by the Cleveland, Columbus, Cincinnati, and Indianapolis, and the Lake Shore railroads. The chief productions in 1870 were 207,518 bushels of wheat, 563,083 of Indian corn, 412,949 of oats, 25,062 of barley, 267,928 of potatoes, 405,478 lbs. of wool, 1,148,946 of butter, 864,172 of cheese, and 59,936 tons of hay. There were 8,811 horses, 21,444 milch cows, 10,463 other cattle, 73,146 sheep, and 11,949 swine; 4 manufactories of agricultural implements, 15 of carriages, 1 of iron castings, 1 of machinery, 8 of saddlery and harness, 4 tanning and currying establishments, 3 flour mills, and 15 saw mills. Capital, Elyria.

**LORCA** (anc. *Eliocroca*), a town of Spain, in the province and 30 m. S. W. of the city of Murcia, on both sides of the Sangonera or Guadalentin; pop. about 48,000. It has an ancient Moorish castle, which once caused it to be considered the key of Murcia. Among the eight parish churches the Gothic one of Santa Maria is the most remarkable. There are manufactories of powder, saltpetre, silk, coarse woollens, linen, leather, hard soap, and earthenware.

**LORD, Nathan**, an American clergyman, born at Berwick, Me., Nov. 28, 1793, died at Hanover, N. H., Sept. 9, 1870. He graduated at Bowdoin college in 1809, and at Andover theological seminary in 1815. In May, 1816, he was ordained pastor of the Congregational church in Amherst, N. H., where he remained 12 years. From 1828 to 1863 he was president of Dartmouth college, and during that time 1,824 students graduated. He was an occasional contributor to theological reviews, and published numerous sermons as well as essays and letters on topics in theology and ethics. Among the latter are a "Letter to the Rev. Daniel Dana, D. D., on Prof. Park's Theology of New England" (1852); an essay on the millennium, read to the general convention of New Hampshire (1854); and two "Letters to Ministers of the Gospel of all Denominations on Slavery" (1854-'5), in which he endeavors by Biblical and religious arguments to prove the lawfulness of slavery. He also edited with an introductory notice a selection from the sermons of his son, the Rev. John K. Lord, a Congregational clergyman, who died in Cincinnati in June, 1849 (Boston, 1850).

**LORDS, House of.** See PARLIAMENT.

**LORD'S DAY**, the legal name of Sunday. In the early ages of Christianity it does not seem to have been supposed that Sunday had taken the place of the Jewish sabbath; but from the days of the apostles it was regarded with veneration, as the *dies dominica*, or the Lord's day. In Great Britain and the United States there is however a different feeling toward



Sunday from that which prevails elsewhere in Christendom; and this is manifested equally in the provisions of law and in common usage. From early times the day was set apart as one not to be employed in secular business, and hence came the maxim quoted by Coke: *Dies dominicus non est juridicus*. So early as in the 27th of Henry VI. (1449) an act was passed prohibiting fairs and markets on certain feast days, Easter Sunday, and "other Sundays." In the 1st of James I. (1603) dealers in leather were prohibited from exposing for sale shoes, &c., on Sundays; and in the 1st of Charles I. (1625) a statute prohibited meetings of persons for any sports and pastimes out of their parishes, or for "bull or bear baiting, common plays, interludes, or other unlawful games and exercises, within their parishes." But in the 29th of Charles II. (1678) the statute was passed which may be regarded as the foundation of all the present law on the subject, in England and in the United States. It enacted "that no tradesman, artificer, workman, laborer, or other person whatsoever, shall do or exercise any worldly labor, business, or work of their ordinary callings, upon the Lord's day or any part thereof (works of necessity and charity only excepted);" and "that no person or persons whatsoever shall publicly cry, show forth, or expose to sale, any wares, merchandises, fruit, herbs, goods, or chattels whatsoever, upon the Lord's day or any part thereof." This act was followed by a series of decisions which, proceeding upon the ground that all prohibitory and penal statutes must be construed rigorously, have certainly confined the operation of the statute within narrower limits than were intended. Thus, while it says that "no other person whatsoever" shall, &c., it has been held that, because general words following particular words must be construed as *ejusdem generis*, therefore the previous particular words, "no tradesman, artificer, workman, laborer," are to be taken as including all those to whom the statute applies; and on this ground it was held by Lord Tenterden that drivers and proprietors of stage coaches are not included, and that a contract to carry a passenger in a stage coach on a Sunday is not unlawful in England. So, too, the words "any worldly labor" are, after some fluctuation, now controlled and limited by the subsequent words "or work of their ordinary callings;" and therefore one who sold a horse on Sunday was permitted to recover the price because it was not "the exercise of his ordinary calling."—In this country we have but little nice construction of this kind applied to what are called, in common parlance, the Sunday laws, although the statutes for the most part speak of Sunday as the Lord's day. The Puritan colonists, if they did not introduce, at least adopted and established to the full extent of their influence, the idea that Sunday was the Christian sabbath, and that it was to be kept holy not merely by the absence of all labor, but by that of all amuse-

ment. One reason for this probably was, although they may not have been conscious of its operation, an earnest desire to confirm and perpetuate the distinction, or rather the opposition and hostility, between them and the Roman Catholic church, and that English Episcopal church which they considered as only the Roman church thinly disguised. Hence their customs in relation to Sunday were rigid to the last extreme, and their laws almost equally so. These laws remained in full force as long as they were sustained by the feelings and habits of the people. But the excessive severity of the earliest years of our colonies could not be maintained either in usage or in law. There was a gradual relaxation, which by the time of the revolutionary war had become very considerable. When the colonies became states, the Sunday laws assumed a form which they have maintained substantially ever since; although it is certain that the observance of these laws has become much less constant and universal than it was formerly, and violations are now habitual and disregarded, which formerly would have been visited with immediate punishment. The laws, in their letter, are very similar in nearly all the states, and they provide generally, but with some diversity of language, that no persons shall engage in any labor, business, or work, excepting only works of necessity and charity, on the Lord's day.—Among the questions which have arisen under these laws, the most important was, whether a contract made on Sunday in violation of law was nevertheless valid, leaving the parties liable to punishment for their breach of the law; but after some diversity of decision, the prevailing if not the universal conclusion now is, that the contract itself, by means of its illegality, is wholly void, conferring no rights and imposing no obligations upon any party. It is, however, admitted that a contract begun on Sunday, and agreed upon as to all its terms, but not in fact completed until the next day, is binding. Thus, if A agrees to sell an article to B for a certain price, and the whole bargain is arranged and agreed to on Sunday, and, in the execution of it, on Monday morning A gives to B the article and B gives to A his promissory note for the price, the property in the article passes, and the note is as valid as if the whole bargain had been made on Monday. But whether a bargain wholly made on Sunday, and therefore void thus far, can be rendered valid by a mere subsequent recognition, is uncertain on the authorities; but their tendency is to the negative. So, too, it has been held that if a sale is made on Sunday and the property then delivered to the buyer, and the price is not then paid, the seller cannot maintain an action for the price, because the contract, being void, imposed no obligation on the buyer; and neither can the seller, if the buyer refuses to return the article, maintain an action for it or its value, because he has parted with the possession by his own wrongful act, and both

parties being violators of the law and in equal fault, the law leaves them to suffer the consequences of their acts, and will not interfere to help either against the other. But other courts have decided that as the Sunday contract is by the statute made wholly void, neither party can make use of it as a defence to a suit brought to recover money paid or property delivered under it.—The question as to what is covered by the exception of works of necessity or charity has frequently been raised. Thus, when a defect in a highway endangered passengers, it was held in Massachusetts to be not only the right but the duty of the proper authorities to repair it on that day. In Pennsylvania, where a son hired a carriage to visit his father, it was declared to be a legal contract, there being no evidence that it was a mere "excursion of pleasure." And in Alabama it was held that a creditor might lawfully enter into a contract with his debtor on Sunday, if he could satisfy a jury that it was necessary to do this on that day in order to save his debt or obtain indemnity. The question was once made whether marriage could lawfully be contracted or solemnized on the Lord's day, but the opinion appears to be universal that the Sunday laws have no application to either the contract or the ceremony. But it, now appears to be settled law, that there is no class of contracts and no acts of a business character which of themselves, and by their own nature, are works of necessity or charity; while any act may be made so by circumstances. Thus, even the solemn act of making a will is not one which may lawfully be made on Sunday, unless the circumstances of the case give to the execution of that will at that time the character of a work of necessity or charity; while, as we have seen, even a bargain of business may be justified and made valid by necessity. In relation to the degree or kind of necessity required to justify an act, a considerable change in public opinion has unquestionably taken place. But not many years since prosecutions were maintained for slaughtering animals for food in weather so hot, that if killed on Saturday the meat would be spoiled on Monday; but now such things are never heard of. On one point, which has come before various courts, there is as yet no settled law. If A makes a bargain with B on Sunday in violation of law, and by an abuse of this bargain inflicts an injury on B, has B no remedy? Thus, if A hires B's horse for a specific journey on Sunday, B cannot recover the hire of the horse; but if A goes four times as far and rides the horse to death, has B still no remedy? So it has been held in some states, while in others the doctrine is, that while B acquires no rights under the contract, he has all his rights to recover damages for the wrong done to him. This seems the better doctrine, and is in conformity with the established principle that the Sunday laws are intended to prohibit and do prohibit only contracts and the transaction of

business on that day, but are not intended to permit a man to commit with impunity on that day a wrong which, if committed on any other day, would expose him to punishment, or give the injured party a claim for damages.—The extent of the Lord's day is not quite certain. Some of our statutes define it, but not all. In Connecticut it has been defined by the courts as extending only from daybreak to the closing of daylight on the Sunday. Generally in New England it is from sunset on Saturday to sunset on Sunday; but for many purposes, and probably in most of the states for all purposes, it begins only at midnight between Saturday and Sunday and ends with the next midnight. Some of the state statutes contain exceptions, providing that the Sunday laws shall not apply to those who conscientiously observe Saturday as the sabbath, if they do not disturb others in their observance of Sunday.—Formerly, a question was raised, not before the courts, but before congress, which produced much excitement, and almost rose to the dignity of a political question, as to the running of the mails on Sunday. But it was practically settled by the system which now prevails through the country, by which the short and local mails do not run on Sunday, nor are the post offices generally open for delivery; but the long mails continue on their route, and the largest post offices are open a part of the day.—Besides the Sunday laws above referred to, special regulations are made for the preservation of order and quiet on the Lord's day, either by general statutes or by municipal regulation. By these it is common to require the closing of the customary places of amusement on that day, and also the places where spirituous or intoxicating liquors are kept for sale, and public sports, games, and plays are prohibited under penalties. As these regulations require observances more or less opposed to the practices which prevail in continental Europe, a strong disposition has been manifested, especially by the immigrant population, to contest them as unwarranted restraints upon liberty, and as interfering with the religious freedom which it is assumed is guaranteed by both federal and state constitutions. It is not to be denied that the right to require the observance of a day as sacred on religious grounds, while a large portion of the political community does not assent to its sacred character, is not one to be conceded without question, nor one easily defended under constitutions which recognize religious equality, and under which therefore it would seem to be incompetent to compel any one to submit to observances on the sole ground that the religion of others required them. But while no respectable court has denied the competency of the legislative requirements for the observance of the first day of the week, it has not generally been deemed necessary to place their decisions on the ground of the sacred character of the day, inasmuch as, on other and purely secular

grounds, it would undoubtedly be competent to establish regulations of police which should make abstinence from the customary labor and sports for one day out of seven compulsory upon all classes of the people.

**LORD'S SUPPER**, or **Eucharist** (Gr. *εὐχαριστία*, thanksgiving), a sacrament instituted by Christ on the night before his death. The former appellation is most common among Protestants, the latter among Roman Catholics. It is also called "holy communion," and its celebration the "communion service." The Greeks name it *εὐλογία*, blessing or praise. Luther in his catechism designates it as "the sacrament of the altar," and various phrases in the New Testament are regarded as referring to it, as "the table of the Lord," "the cup of the Lord," and "the breaking of bread." In the Latin church the name eucharist is given to the consecrated elements of bread and wine which constitute the sacrament; the consecration service is called "mass," and the receiving of the sacrament is the communion.—From the earliest times the vast majority of Christians have celebrated the Lord's supper as an ordinance instituted by Christ and enjoined expressly by the words, "This do in remembrance of me." The Manichæans and Gnostics in the first centuries denied that it was of divine institution, because they regarded wine as coming from the evil principle and its use as sinful; in our own times it has also been set aside by the society of Friends. The institution of this sacrament is recorded in the first three Gospels, and in Paul's first epistle to the Corinthians (xi. 24–26). The words of institution, as well as the language of the early fathers in speaking of this ordinance, have given rise to various and opposite interpretations. The chief difficulty has been and is still in determining the exact meaning of Christ's words, "This is my body," "This is my blood." Ignatius, Justin, and Irenæus laid great stress on the mysterious connection existing between the Logos and the elements. Other fathers spoke of the elements as the symbols of the body and blood of Christ; thus Tertullian and Cyprian, both of whom, however, occasionally call the Lord's supper the body and blood of Christ. It was especially the Alexandrian school (Clement of Alexandria, Origen, &c.) that advocated the symbolical sense, and even opposed those who made no distinction between the external sign and the thing itself. The church writers became more explicit on the subject of the Lord's supper when after the 3d century the liturgical part of divine service was more developed. Chrysostom called it an "awful mystery." Some of the fathers spoke of "a real union" of the communicants with Christ; others of "a real change" from the visible elements into the body and blood of Christ. The idea that the Lord's supper was also a sacrifice was propounded as early as the end of the 2d century.—The first great eucharistic controversy was

called forth by a book of Paschasius Radbertus in 831 (*De Corpore et Sanguine Domini*), in which he advanced the doctrine that the substance of the consecrated bread and wine in the eucharist was changed into the very body of Christ which was born of the Virgin. He was especially opposed by Ratramnus, a monk of Corbie, who adhered to the view that in the Lord's supper there is a communion of the earthly with the heavenly. The controversy was brought before the highest ecclesiastical authorities, when Berengarius, archdeacon of Angers, maintained that there was a change in the sacramental elements only in a figurative sense. He contended that not the earthly elements themselves, but their influences, were changed by their connection with Christ in heaven, who was to be received not by the mouth but by the heart. These views were in particular expressed in a letter to Lanfranc, afterward archbishop of Canterbury, who was the first to propound in formal thesis the theory that after the consecration the bread and wine retained their sensible properties or "accidents" although their "substance" or "subject" had been changed into the flesh and blood of Christ. Several synods in succession, between 1050 and 1080, condemned the views of Berengarius. The scholastics who came after Lanfranc maintained this distinction between accidents and substance. Finally the term "transubstantiation" was used in the 12th century by Hildebert of Tours, and was soon generally adopted. The fourth council of Lateran, in 1215, declared transubstantiation an article of faith, and in 1267 a special holy day (Corpus Christi) was instituted, to give annually a public manifestation of the belief of the church. Long before it had become customary in the Latin church to give to the laity the Lord's supper only under the form of the bread, though, as the church declared, solely from reasons of expediency. The council of Basel expressly confirmed the doctrine that Christ exists wholly in either of the elements (for which doctrine the theologians used the term "concomitance"). Abbot Rupertus Quotiensis, in the 12th century, had advanced the doctrine of the union of the body and blood of Christ with the bread (impanation), and was followed by several theologians, even after the definition of the dogma of transubstantiation by the Lateran council. Wycliffe opposed both transubstantiation and impanation. The Greek church, when it separated from the Latin, also believed in a change of the elements into the body and blood of Christ; and in the efforts for a union of the two churches, the question of leavened or unleavened bread was the only point of difference with regard to the Lord's supper.—With the reformation of the 16th century the controversy respecting this doctrine began anew: The reformers agreed in rejecting the mass and transubstantiation, and demanded, as the Hussites had done before them, that the sacrament

should be given to the laity under both forms. But they differed among themselves concerning the true sense of the words of institution and what constituted the essence of the sacrament. Luther maintained the real and substantial presence of the body and blood of Christ, taking place, not by a transmutation of the external elements, but by a supernatural and inconceivable union (*unio sacramentalis*) of the body and blood of Christ with the consecrated bread and wine. Christ is present, according to the words of the larger catechism of Luther, in, with, and under the bread, and is received not only by the good, but also by the wicked. In connection with his doctrine of the Lord's supper Luther maintained the ubiquity of the body of Christ. The objective effect of the Lord's supper, according to Luther, is the remission of sins; the subjective consists in the confirmation of the regeneration which commenced in baptism. Zwingli regarded the bread and wine only as signs of remembrance of the body and blood of Christ, which are in heaven. The effect, in his opinion, consists in a confirmation of our faith in the redemption of mankind through the death of Christ. He explained the "is" in the phrase "This is my body" in a figurative sense, as synonymous with "signifies." Ecclampadius differed from Zwingli only in the grammatical construction of the words of institution, taking not the word "is," but the whole phrase, and in particular the words "my body," in a figurative sense. Calvin agreed with Zwingli in taking bread and wine only as external signs, but with Luther he believed in a real though only spiritual participation of the body and blood of Christ. This participation does not consist in the infusion of a divine substance, but in a spiritual, animating power which from the glorified body of Christ streams over into our souls. As the glorified body of Christ is now only in heaven, the soul, in order to partake of it, must be elevated in a mysterious manner, through the agency of the Holy Spirit, to heaven, where it receives the body of Christ not with the mouth, but by faith. Unbelievers do not receive the body of Christ, but only the sign to their own condemnation. When, in the second half of the 16th century, some Lutheran theologians inclined, after the example of Melancthon, to the doctrines of Calvin, the Crypto-Calvinistic controversy arose in the electorate of Saxony; it ended with the banishment of the Crypto-Calvinists. Most of the other Protestant denominations which arose in and after the 16th century adopted the views of Zwingli. The modern German theology of the United Evangelical church aims generally at a compromise between the views of Luther and Calvin, emphasizing real, objective communication of Christ to the worthy receiver, but dropping Luther's doctrine of the ubiquity of Christ's body. In the Lutheran church and the Protestant Episcopal church eucharistic controver-

sies have often occurred, as one party in each church still lays great stress on the real and substantial presence of Christ in the Lord's supper, while another party strenuously opposes it. Those divines of the Lutheran church who adhere to Luther's views concerning the real presence, are generally opposed to an admission of members of the Calvinistic or Zwinglian confessions to the celebration of the Lord's supper in Lutheran churches, and still more to Lutherans receiving the sacrament in Calvinistic or Zwinglian churches. A similar question (open or close communion) is agitated in the Baptist churches (see BAPTISTS), where one party maintains that none can be admitted to the Lord's supper save those who have been baptized (immersed) on a personal profession of their faith in Christ, while others admit all evangelical Christians.—The elements used at the Lord's supper are generally bread and wine. Christ, when celebrating the passover with his disciples, used unleavened wheat bread. The apostolic church took the leavened bread which Christians used to bring with them for offerings. When these offerings ceased together with the agapæ, the Greek church retained the leavened bread, while in the Latin church since the 8th century unleavened bread has been used. At the separation of the Greek church from the Latin, the use of unleavened bread by the latter formed one of the principal charges brought against them by the Greeks, and proved afterward one of the greatest obstacles to a reunion of the two churches. The council of Florence, in 1439, which attempted this reunion, determined that either leavened or unleavened bread might be used; but the eastern church soon rejected this compromise together with the union of the churches. The Latin church gave to the bread the form of a wafer, which received the name "host" from the Latin *hostia*, offering. On one side of it symbolic signs are stamped, but the ritual prescribes nothing on this point. The Lutherans retained the wafer, but the Reformed and other Protestant denominations declared themselves against it, and took again common bread, and most of them also reintroduced the custom of breaking it. The question whether the wine used by Christ in the institution of the eucharist was fermented or not, is quite modern. The Roman Catholic church holds that the valid matter should be *vinum de vite*, wine of the grape. Its color is held of no account, though white wine is generally used. The custom of mingling water with wine is said to have been introduced by Pope Alexander I.; it was expressly enacted in the 12th century by Clement III., and regarded as a symbol of the blood and water which streamed from Christ's side on the cross. The Roman Catholic church mingles water with wine once before the consecration; the Greek church twice, cold water before and warm water after the consecration. The Armenian and Protestant churches take unmixed wine.—It is admitted by all that in the primitive church the

Lord's supper was always celebrated under the two forms of the bread and the cup, and that sects like the Manichæans, who rejected the wine, were strongly censured. It was, however, an early custom to carry to sick persons merely the bread dipped in wine. In the 13th century Robert Pulleyn of Oxford declared it a good custom to give to the laity the bread only, to avoid the danger of spilling any of the wine. This view was very soon adopted by all the scholastics, who maintained that Christ was wholly present under either form, and that one form was sufficient for a valid communion, while for the celebration of the mass, or a true sacrifice, both elements were required. Thomas Aquinas and Bonaventura especially recommended the universal introduction of the communion under one form, and this soon became the practice of the entire church. All the sects and reformers of the middle ages, as the Waldenses, Huss, Wycliffe, and Savonarola, protested against this withholding of the cup from the laity. The Protestant churches agreed in regarding the use of both forms as essential both for communion and for the celebration of the ordinance. The practice of the Roman Catholic church was confirmed by the council of Trent in 1563, and has always since been adhered to by the church. Those portions of the eastern churches which have acknowledged the supreme jurisdiction of the pope (United Greeks, Armenians, Copts, &c.) have been permitted to retain the communion under both forms, and the same was offered to the Protestants in the attempts to effect a corporate union between them and the Roman Catholic church.—In the ancient church bread and wine were consecrated by the bishops and presbyters and distributed by the deacons. What change is effected by the consecration is, like the essence of the Lord's supper itself, a subject of controversy among the various Christian denominations. The Roman Catholic and the eastern churches believe that the consecration was the change of the elements into the body and the blood of Christ; the Protestant denominations think that, in general, the consecration was regarded in the ancient church, as it is by them now, as a setting apart for and devoting to sacred use, without any substantial change in the elements. The formulas used at the distribution of the Lord's supper were early fixed in liturgies. All the old liturgies contain the words of institution and a prayer; that of the Greek church a prayer to the Holy Spirit to change bread and wine into the body and blood of Christ.—The place where the Lord's supper was celebrated was at first the dwellings of the believers. In times of persecution they often had to celebrate it in hidden places, such as the tombs of the martyrs. As ecclesiastical architecture was developed, special altar tables or altars were introduced for its celebration. The time of celebration was at first, in accordance with the name and the institution of the ordinance,

the night or evening; but it soon became a practice to connect it with the morning service, and so it is still in most churches; the Moravians, however, celebrate it always at the evening service. Communion was generally very frequent in the first ages, but became gradually rarer. In the 5th century several ecclesiastical writers complained of the remissness of Christians in this respect. Later synods prescribed that all the faithful should receive it on the high festivals of the church (Epiphany, Easter, Pentecost, and Christmas). The fourth council of Lateran, in 1215, commanded that all adults should receive communion at Easter time, under pain of mortal sin. All the writers of the church strongly recommended to the faithful frequency of communion. The same was urged by the reformers of the 16th century. The Protestant churches in former centuries in some cases punished those who had not appeared at the communion table for a long time or who despised the eucharist with banishment, excommunication, and refusal of Christian burial. The free Protestant churches have generally in their constitutions and statutes some provision for the proceedings to be observed toward church members who refrain from the celebration of the Lord's supper.—The ancient church excluded the catechumens and the *lapsi* from the Lord's supper, and often gave it to children. Infant communion lasted in the Latin church till the 12th century, and still exists in the Greek church. The deacons used to carry it to those who were prevented from being present at divine service. The apostles received it from Christ, according to eastern custom, reclining; in the 4th century the custom of standing, and later that of kneeling, was introduced. Kneeling is still the general or prevailing practice among Roman Catholics, the eastern churches, the Protestant Episcopal church, the Methodists, and the Lutherans; in the other churches, sitting prevails, as being a more Scriptural posture. In a few denominations it is customary to sit round a table, and in some places 12 always sit down at a time. At first bread and the cup were given into the hands of the communicants; later the distributing clergyman sometimes placed the bread in their mouth, and held the cup to their lips. The self-communion of the laity is prohibited by all the Christian churches; the self-communion of clergymen is generally practised in the Roman Catholic and the eastern churches, and is also customary in the Protestant Episcopal church and among the Moravians. In some churches various ceremonies, as burning of candles, &c., accompany the celebration; in most of the reformed churches nothing is changed in the usual form of the divine service, except that a special communion service is used. The Protestant churches generally have allowed a great liberty with regard to the mode of celebration, and there is accordingly a great variety of usages, which it would



require too much space to describe.—Histories of the doctrine of the Lord's supper in the Christian church have been written by Schulz (rationalistic), *Die Christliche Lehre vom Abendmahl* (2d ed., Leipsic, 1831); Ebrard (evangelical), *Das Dogma vom heiligen Abendmahl und seine Geschichte* (2 vols., Frankfurt, 1845-'6); Kahnis (High Lutheran), *Die Lehre vom Abendmahl* (Leipsic, 1851); Rückert (rationalistic), *Das Abendmahl, sein Wesen und seine Geschichte in der alten Kirche* (2 vols., 1856); Wilberforce, "Doctrine of the Eucharist" (London, 1853); J. Taylor, "True Doctrine of the Eucharist" (1856); and E. B. Pusey, "Real Presence" (1853-'7). An account of the mode of its celebration by the various denominations is given by Scheibel, *Kurze Nachricht von der Feier des heiligen Abendmahls bei den verschiedenen Religionsparteien* (Breslau, 1824).

**LORENZ, Ottokar**, a German historian, born in Iglau, Moravia, in 1832. He graduated at Vienna, and in 1860 became extraordinary, and in 1866 ordinary professor of history at the university. He was also employed in the secret archives of the court and state, but lost this post in 1865 on account of his publications against the Schmerling administration. His principal works are: *Deutsche Geschichte im 13. und 14. Jahrhundert* (2 vols., Vienna, 1863-'7); *Deutschlands Geschichtsquellen im 13. und 14. Jahrhundert*, and *Papstwahl und Kaiserthum* (1874). With W. Scherer he published *Geschichte des Elsass von den ältesten Zeiten bis auf die Gegenwart* (Berlin, 1871.)

**LORENZO DE' MEDICI.** See MEDICI.

**LORETO**, or **Loretto**, a town of Italy, in the province of Macerata, 3 m. from the Adriatic and 12 m. S. of Ancona; pop. about 10,000. It is chiefly celebrated as the site of the Casa Santa, or holy house, in which, according to local tradition, the Virgin Mary was born, the annunciation and incarnation took place, and the holy family resided on their return from Egypt. The legend is that the house was transported by angels in 1291 from Nazareth to Tersate on the E. coast of the Adriatic, and thence in 1294 to the coast of Italy near Recanati. Eight months afterward it was again removed to the lands of a lady named Lauretta, from whom the town, built on the site for the accommodation of pilgrims, takes its name. Another legend says that the holy house was placed in a grove of laurels, whence the name Loreto. The Casa Santa is a rudely built brick house, 13½ ft. high, 27½ ft. long, and 12½ ft. wide, with one door and one window. In a niche over the fireplace is an ancient image of the Virgin, said to have been made of the cedar of Lebanon, and attributed to St. Luke. It was taken away by the French, Feb. 10, 1797, carried to Paris, restored by Napoleon to Pius VII., and by him enriched with precious stones and returned to Loreto, Dec. 9, 1802. The relics, treasures, and offerings of different pilgrims are numerous and

valuable. The house is enclosed in a marble casing designed by Bramante, and covered with exquisite sculptures in relief. This shrine is in the church called Chiesa della Santa Casa, built by Sixtus V., and entered by three superb bronze doors, with bass-reliefs representing Scriptural scenes. The bell tower is of great height, and the bell weighs 22,000 lbs. Other objects of attraction are a bronze statue of the Virgin and child, by Girolamo Lombardo, over the main entrance, and the font in bronze ornamented with bass-reliefs. The chapels are profusely decorated with carvings, mosaics, arabesques, and frescoes. On one side of the church is a convent of the Jesuits, and on the other side the Palazzo Apostolico, the residence of the bishop and of the governor while the province formed a part of the Papal States. It contains many fine paintings, among which are some by Titian, Guercino, Annibale Carracci, and Correggio. The town, which stands on a hill, and consists mainly of a single street, was strongly fortified in 1586 by Sixtus V. as a protection against pirates.

**LORI**, a quadrumanous animal of the lemur family, and genus *stenops* (Illiger). The teeth are: incisors  $\frac{1}{4}$ , canines  $\frac{1}{2}$ - $\frac{1}{4}$ , molars  $\frac{5}{8}$ - $\frac{3}{8}$ ; the ears are short and rounded; the eyes large and near together; the fore finger no longer than the thumb; the tail very short or absent. They form the family *nycticebidae* of some authors. They are nocturnal in their habits, and so slow in their movements that they are often called slow lemurs; they live on trees, eating fruit and insects, and sometimes small birds which they surprise at night. The aposo (*S. potto*, Ill.) is of a reddish color, and inhabits the Gold coast of Guinea; the spinous processes of the last five cervical and first two dorsal vertebrae, according to Van der Hoeven, pierce the hairy



Lori (*Stenops tardigradus*). a. Skull. b. Hind foot.

integument, and have only a weak horny covering. The slow lori (*S. tardigradus*, auct.) is of a yellowish gray color, with a dark dorsal band, and a narrow whitish stripe between the eyes; it is as slow as the sloth; it inhabits Bengal, Siam, Borneo, and Sumatra. (See LEMUR.)

**LORIENT**, or **L'Orient**, a seaport town of Brittany, France, in the department of Morbihan, on the bay of Biscay, at the mouth of the river Scorff, which is here joined by the Blavet, 266 m. W. S. W. of Paris, and 80 m. W. by N. of Vannes; pop. in 1872, 34,660. It has a dockyard with 16 building slips, connected with which are an arsenal, a school of naval artillery, artillery barracks, &c. The port is capacious and safe, lined by handsome quays, and surrounded by magnificent buildings, among which is a signal tower on an eminence S. of the harbor, from which vessels can be seen 30 m. out at sea. The trade and commerce, once of considerable importance, have greatly decayed. The exports are chiefly flour, wine, brandy, liqueurs, woollens, cottons, and hardware. The only manufacture of consequence is of hats. It is the seat of a maritime prefecture, has courts of commerce, a chamber of commerce and exchange, a school of hydrography, and a communal college. The origin of Lorient is due to the naval depot founded there in 1666 by the French East India company, which from this circumstance took the name of *Port de l'Orient*, "port of the East." The building of the town was commenced in 1720, and in 1744 it was fortified. In 1770 it was made one of the four stations of the French navy, and a free port; but the revolution annihilated its commerce, and it has never been recovered.

**LORME**, **Marion de**. See **DELORME**.

**LORINSEER**. **I. Karl Ignaz**, a German physician, born in Bohemia, July 24, 1796, died at Patschkau, Prussian Silesia, Oct. 2, 1853. He studied in Prague and Berlin, where he graduated in 1817. He was connected for some time with the veterinary school in Berlin, and subsequently with the medical college in Stettin, and was medical councillor in various places till 1850, when he retired. He was a high authority on epidemic and cattle diseases. His principal works are: *Encyklopädie der Thierheilkunde* (Berlin, 1820); *Lehre von den Lungenkrankheiten* (1823); *Zum Schutze der Gesundheit auf Schulen* (1836), which opened a protracted controversy, during which more than 70 treatises were published on the subject, and led to the restoration of gymnastic exercises in Prussian gymnasia; *Untersuchungen über die Rinderpest* (1831), which saved Silesia and other countries from a renewed outbreak of the cattle disease; a treatise on the cholera, in the *Jahrbücher für wissenschaftliche Kritik*, which produced great difference of opinion among physicians, and resulted in the removal of the military cordons which had been established to arrest the spread of the epidemic; and *Die Pest des Orients* (1837). His autobiography, edited by his son, appeared in 1864. **II. Franz**, a Roman Catholic theologian, son of the preceding, born in Berlin, March 12, 1821. He studied in Breslau, Munich, and Rome, took his doctor's degree in Munich in 1844, and became a pastor in Breslau and spiritual director at the seminary

of priests. The latter office was conferred upon him after the publication of his *Entwicklung und Fortschritt in der Kirchenlehre* (Breslau, 1847). He edited the *Schlesisches Kirchenblatt* from 1852 to 1864, and published various works, including translations of the writings of Balmes and other Spanish philosophers, and narratives of his travels in Spain. He also translated Calderon's plays for religious festivals (*Geistliche Festspiele*, 9 vols., Ratisbon and Breslau, 1856-'66).

**LORRAINE** (Ger. *Lothringen*), an old province of N. E. France, formerly bounded N. by Belgium, Luxemburg, and Rhenish Prussia, N. E. by Rhenish Bavaria, E. by Alsace, S. by Franche-Comté, and S. W. and W. by Champagne, thus comprising the territory now constituting the departments of Meuse, Meurthe-et-Moselle, and Vosges, besides various districts now ceded to Germany. Its principal rivers are the Meuse, Moselle, Meurthe, Saône, and Ornain; the principal products are iron, salt, and other minerals, timber, grain, wine, and cattle. The inhabitants are mostly of German race, but only in a small part, between the Vosges and Metz, has the German language maintained itself; this part is therefore called German Lorraine. The province was formerly divided into the duchy of Lorraine, comprising Lorraine proper, German Lorraine, and the territory of Vosges, with Nancy, Saargemünd, and Épinal as capitals; the duchy of Bar, the capital of which was Bar-le-Duc; and the "three bishoprics," Metz, Toul, and Verdun.—Under the Roman emperors, the country formed a part of the province of Belgica Prima. It was conquered by Clovis, and on the division of the Frankish kingdom under his sons belonged to Austrasia. When the empire of Charlemagne had been repeatedly divided among his descendants, the division or kingdom of Lothaire, son of the emperor Lothaire I., received the name of *Lothars Ryk* in Low German, or *Lothari Regnum* in Latin, whence sprang the names Lotharingia in mediæval Latin, Lorraine in French, and Lothringen in German. His possessions, however, by far exceeded the limits of modern Lorraine, extending from the Moselle to the North sea. After his death in 869, Lorraine was divided between France and Germany, but subsequently the whole of it was attached to the latter empire. In the 10th century it was given by Otho the Great to his brother Bruno of Cologne, and was subsequently divided into Lower and Upper Lorraine. The former in later times received the name of Brabant, and eventually became a province of the dukes of Burgundy. The latter retained its name, and was conferred about the middle of the 11th century by the emperor Henry III. upon Gérard of Alsace, the founder of a long dynasty of dukes, who with some interruption ruled Lorraine down to 1737, and some of whom greatly distinguished themselves in the wars of France and the empire. Collateral branches of the

family were the Guises, Aumales, Elbœufs, Harcourts, and others distinguished in the history of France. During the reigns of Francis I., Henry II., Louis XIII., Louis XIV., and Louis XV., Lorraine was a principal object of contention between the empire and its western rival. The three bishoprics were secured to France by the peace of Westphalia (1648). Finally, by the peace which terminated the war of Polish succession, the ex-king of Poland, Stanislas Leszczyński, father-in-law of Louis XV., received Lorraine and Bar, which were to be annexed after his death to France; the duke of Lorraine, Francis Stephen, the future husband of Maria Theresa of Hapsburg and emperor, receiving in exchange the reversion of the grand duchy of Tuscany, in which as in Austria he became the founder of the house of Hapsburg-Lorraine. Stanislas died in 1766, when Lorraine became fully annexed to France. In 1815 a small district was ceded to Prussia and incorporated with the province of the Rhine. By the peace of Frankfort, May 10, 1871, France ceded the whole of German Lorraine and the city of Metz with the adjacent district to the German empire. The ceded territory now constitutes one of the three administrative districts into which the Reichsland of Alsace-Lorraine is divided. It has an area of 2,400 sq. m.; pop. in 1871, 490,308, of whom about 170,000 speak French. (See ALSACE-LORRAINE.)

**LORRAINE, Charles de**, a French statesman, brother of the second duke of Guise, and best known as the cardinal de Lorraine, born in Joinville, Feb. 17, 1525, died Dec. 26, 1574. At the age of 13 he received the archbishopric of Rheims, which his uncle Jean de Lorraine had resigned in his favor. In 1547 he officiated at the coronation of Henry II., and almost immediately afterward was made a cardinal. He was sent to Rome in 1555 to conclude an alliance with the pope against Charles V., and both in this and in various other diplomatic missions displayed a remarkable talent in the management of affairs of state. His conduct, however, sometimes excited the suspicion of his sovereign; and having on one occasion seriously offended the king by assuming the title of cardinal of Anjou, and thereby reviving the claims of his family to the county of Provence, it needed all the influence of the Guises and the protection of Diana of Poitiers to restore him to favor. In 1558 he had a secret interview at Péronne with the bishop of Arras (afterward Cardinal Granvelle), minister of Philip II., at which he was induced to lend his influence for a peace between France and Spain and the mutual co-operation of the two monarchs against the Protestants. The peace was concluded soon afterward, but the cardinal had now quarrelled with Diana, and both in the negotiations for this treaty and in the subsequent favors of the French king saw himself supplanted by the constable de Montmorency. Under Francis

II., whom he also crowned, he was restored to power and obtained the administration of the finances. In 1561 he placed the crown upon the head of Charles IX. He sat in the council of Trent the following year, and threatened, if the council were not declared above the pope, to present a protest signed by 120 bishops. He went to Madrid in 1569 to negotiate a marriage between Charles IX. and Elizabeth of Austria. The cardinal was a liberal patron of letters and the founder of the university of Rheims. He possessed great powers of oratory and literary ability, but was vain, ambitious, and presumptuous, and incurred much enmity.

**LORRAINE, Claude**. See CLAUDE LORRAINE.

**LORTZING, Albert Gustav**, a German composer, born in Berlin, Oct. 23, 1803, died there, Jan. 21, 1851. His father, who was connected with the theatre, introduced him upon the stage while a child, and in a few years he began to compose songs and marches. He officiated in the twofold capacity of actor and singer from 1819 to 1822 at Düsseldorf and Aix-la-Chapelle, and afterward at Cologne till 1826, when he became connected with the theatre at Detmold. In 1833 he accepted an engagement at Leipsic, where he made himself well known as a composer. In 1846 he became connected with the stage at Vienna, and in 1848 went to Leipsic. In 1850 he returned to Berlin, where at the time of his death he was chapel-master at the Friedrich-Wilhelmstadt theatre. His best known compositions are *Der Pole und sein Kind* (1826), *Zar und Zimmermann* (1837), *Hans Sachs* (1840), and *Undine* (1845). His opera *Regina* was announced for representation for the first time at Nuremberg in 1874. —See Düringer, *Albert Lortzings Leben und Wirken* (Leipsic, 1851).

**LORY**, a division of the parrot family, embracing several very showy birds of the East Indian and South Pacific archipelagos, characterized by a large but rather slender bill, curved to the pointed tip, and with the lateral margins nearly smooth; the weakness of the lower mandible and the absence of prominences on the palate, and their softer tongue, often furnished with a pencil of bristles, show that their natural food is soft pulpy fruits and the juices of plants and flowers, and not the hard nuts and seeds eaten by most other parrots. The tail is generally of moderate length, rounded or graduated; the legs stout, and the wings long and pointed; the prevailing color is a brilliant scarlet. In the typical genus *lorius* (Brisson), embracing about half a dozen species found in Borneo, the Moluccas, and New Guinea, the wings are moderate, with the second and third quills longest; feathers of the tail broad and rounded. One of the handsomest is the purple-capped lory (*L. domiceila*, Briss.), about a foot long; the color is rich scarlet, with a yellow color on the breast, purplish crown, greenish wings with a bluish violet flexure, bluish green thighs, and orange

yellow bill; it is highly esteemed for its beauty, activity, docility, and powers of articulation. The black-capped lory (*L. tricolor*, Steph.), about the size of a pigeon, is scarlet and violet, with black crown, green wings, and tail varied with red, green, and violet; it pronounces very



Papuan Lory (*Charmosyna Papuensis*).

distinctly the word "lory," which has given the name to the subfamily. The Papuan lory has a very long wedge-shaped tail, especially the median two feathers, and is put by Wagler in his genus *charmosyna*; this, the *C. Papuensis* (Wagl.), is a very elegant bird, the ground color of the plumage being brilliant scarlet; the top of the head, nape, lower back, rump, and tibiae deep azure; sides of breast and thighs rich yellow; wings green, as also the basal half of the tail; the tips of the tail feathers saffron yellow.

**LOS ANGELES**, a S. county of California, on the Pacific, drained by the San Gabriel, Los Angeles, and Santa Anna rivers; area, about 6,000 sq. m.; pop. in 1870, 15,309, of whom 236 were Chinese. Except in the Los Angeles, Santa Anna, and San Fernando valleys, the surface is mountainous. These valleys are exceedingly fertile. Gold, silver, tin, copper, asbestos, and coal mines abound. Petroleum is found in the San Fernando hills, and a few wells are in operation. The county is noted especially for its extensive culture of the vine and semi-tropical fruits. The chief productions in 1870 were 12,210 bushels of wheat, 454,896 of Indian corn, 153,080 of barley, 20,407 of potatoes, 962,603 lbs. of wool, 65,590 of honey, 531,710 gallons of wine, and 11,249 tons of hay. There were 9,652 horses, 635 mules and asses, 2,468 milch cows, 19,226 other cattle, 247,603 sheep, and 5,702 swine; 2 manufactories of carriages, 2 of brick, 7 of saddlery and harness, 3 of tin, copper, and sheet-iron ware, 43 of wine, 2 breweries, 2 distilleries, 2 flour mills, and 1 quartz mill. Capital, Los Angeles.

**LOS ANGELES**, a city and the capital of Los Angeles co., California, on the W. bank of Los Angeles river, a small stream, 30 m. above its entrance into the Pacific, and 350 m. S. S. E. of San Francisco; pop. in 1850, 1,610; in 1860, 4,392; in 1870, 5,728, of whom 2,004 were foreigners; in 1874, estimated by local authorities at 11,000. The Los Angeles and San Pedro railroad extends to the bay of San Pedro (22 m. S.), which forms its harbor. The Southern Pacific railroad is completed 28 m. S. E. and 25 m. N. of the city, and about 100 m. remain to be built (1874) to connect Los Angeles with San Francisco. The Los Angeles and Anaheim line is 29 m. long, and a narrow-gauge railroad to the nearest point on the coast (14 m.) is in progress. Along both banks of the river below Los Angeles extends a fertile plain, planted with vineyards and orange groves, and there are also large vineyards within the city limits. In the N. W. portion there is a hill 60 ft. high, commanding a fine view of the city. The adobe buildings, of which it was originally composed, are fast giving way to larger and more imposing structures. It has a large and varied trade with the interior, and contains three banks, St. Vincent's college (Roman Catholic), several public schools, including a high school, a public library, three daily, a semi-weekly (Spanish), and two weekly (one German) newspapers, and a monthly periodical. The city is frequented in winter by invalids on account of its mild climate. It was settled by the Spaniards in 1780, and was called Pueblo de los Angeles, "town of the angels," from the excellence of its climate and the beauty of its surroundings.

**LOS HERREROS**. See BRETON DE LOS HERREROS.

**LOSSING, Benson John**, an American author, born at Beekman, N. Y., Feb. 12, 1813. After receiving a common school education he was apprenticed to a watchmaker in Poughkeepsie, with whom he afterward entered into partnership. In 1835 he became editor and part proprietor of a newspaper, the "Poughkeepsie Telegraph," and soon after began the publication of a literary monthly, "The Poughkeepsie Casket." With a view to illustrate this he studied drawing and engraving in New York, where he established himself as a draughtsman and engraver on wood, at the same time editing and illustrating the "Family Magazine," and in 1848-'9 the "Young People's Mirror." His attention being turned to the study of American history, he resumed his residence in Poughkeepsie, although for some years he retained his connection as draughtsman with the engraving establishment in New York. He repeatedly travelled through the United States, for the purpose of making drawings of historical scenes, visiting historical characters, and consulting historical documents. He furnished to periodicals many illustrated papers, chiefly relating to American history and biography, in respect to which he also collected a vast

amount of original material. In 1872 he became editor of the "American Historical Record and Repertory of Notes and Queries," published in Philadelphia. Among his numerous works, mostly illustrated by himself, are: "Outline History of the Fine Arts" (1841); "Seventeen Hundred and Seventy-Six" (1847); "Lives of the Signers of the Declaration of Independence" (1848); "Pictorial Field Book of the Revolution" (2 vols., 1850-'52, originally issued in numbers); "Lives of Eminent Americans" (1855); "Pictorial History of the United States" (1854; enlarged ed., 1856); "The Statesman's Manual," in conjunction with Edwin Williams (4 vols., 1856); "Mount Vernon and its Associations" (1859); "Life and Times of Philip Schuyler" (2 vols., 1860; enlarged ed., 1872); "Life of Washington" (3 vols., 1860); "The Hudson, from the Wilderness to the Sea" (1866); "Pictorial History of the Civil War in the United States" (3 vols., 1866-'9); "Vassar College and its Founder" (1867); "Pictorial Field Book of the War of 1812" (1869); and a graded series of histories of the United States. He is a member of various historical and kindred societies, and in 1872 the honorary degree of LL. D. was conferred upon him by the university of Michigan. He now (1874) resides at Chestnut Ridge, Dover, N. Y., and is engaged in the preparation of a history of the United States for youth.

**LOSS OF SPEECH** (*aphasia*). See BRAIN, DISEASES OF THE, vol. iii., p. 203.

**LOT**, primarily, that which falls to any one as his portion or destiny; hence, a die or anything used in the determination of fortunes and events by chance. This method of divination, in some form, and for different purposes, has been almost universally known. Among the Hebrews, the land of Canaan was divided by lot, as were the cities which were distributed among the priests and Levites. The casting of lots is also mentioned in connection with other important private and public transactions. The Greeks and Romans were accustomed to divine auguries from lots, by having each of them marked with a prophetic verse or other inscription. They also opened the works of the poets, as Homer, Euripides, or Virgil, at hazard, and regarded the passage on which their eye first fell as an oracle. The Bible has been used in this latter method, but the practice has been denounced by several councils. Election by lot prevailed in the Christian church at an early day.

**LOT**, son of Haran, and nephew of Abraham. His history is related in Gen. xi.-xix. With his grandfather Terah and his uncle Abraham he went from Ur of the Chaldees to Haran, and thence with the latter to Canaan. With Abraham he took refuge in Egypt from a famine, and with him returned to Canaan. Here quarrels arose between the shepherds of Abraham and those of Lot, because they had not room enough together for their increasing flocks. Abraham proposed a separation, and

generously left to his nephew the choice of the location. Lot chose for himself the well watered region of the Jordan, and his flocks pastured as far S. as Sodom. Thus he was involved in the fate of the kings of that region, when they strove to make themselves independent of Chedorlaomer, the king of Elam; he was carried away captive, but was rescued and brought back by Abraham. He now fixed his abode in Sodom. The ten righteous for whose sake the Lord had promised Abraham not to destroy the city not having been found, two angels came to Lot and warned him to escape. He accordingly fled to Zoar, which was preserved as a refuge for him, with his wife and two daughters, whose husbands, with whom they had not yet cohabited, refused to accept the warning. Then the narrative adds: "But his wife looked back from behind him, and she became a pillar of salt;" a passage which has received many conjectural interpretations. Lot afterward fled from Zoar to the neighboring mountains, and dwelt with his daughters in a cave. The latter, apprehensive lest their race might die out with them, made their father drunk with wine, and became by him the mothers of Moab and Ammon, the progenitors of the Moabites and Ammonites. Mohammedan tradition says that Lot was sent to the inhabitants of the five cities as a preacher of warning, and attaches his name to the cities. The local name of the Dead sea is *Bahr Lut*, sea of Lot.

**LOT**, a river of France, which rises in the department of Lozère on the west of the Cévennes, pursues a westerly course through the departments of Aveyron and Lot, and joins the Garonne at Aiguillon, in Lot-et-Garonne, after a course of about 250 m., of which about 180 m., commencing at Entraigues, are navigable. Its chief affluents are the Coulagnes, Truyère, and Célé on the right, and the Dourdou on the left.

**LOT**, a S. W. department of France, in Guienne, bordering on Corrèze, Cantal, Aveyron, Tarn-et-Garonne, Lot-et-Garonne, and Dordogne; area, 2,012 sq. m., pop. in 1872, 281,404. The surface is mainly an extensive plateau of limestone, with an average elevation of 1,500 ft. above the sea, traversed in all directions by ridges of hills rising to a height at the most elevated point of 2,500 ft., and toward the east abutting on the mountains of Cantal, and drained by the rivers Lot and Dordogne. The deep soils of the lower grounds produce wheat, maize, barley, and oats; and the river slopes are planted with vines. The best wine is that of Cahors and Grandconstant. The mulberry tree is cultivated for silkworms, and truffles, known as *truffles de Périgord*, form an important export. The principal fruit is prunes, the drying and preparation of which form an important branch of industry. Minerals and manufactures are of little importance. It is divided into the arrondissements of Cahors, Figeac, and Gourdon. Capital, Cahors.



**LOTBINIÈRE**, a S. county of Quebec, Canada, bounded N. W. by the St. Lawrence river above Quebec; area, 720 m.; pop. in 1871, 20,606, of whom 17,340 were of French and 2,872 of Irish origin or descent. It is watered by the Du Chêne and Beaurivage rivers, and is traversed by the Grand Trunk railway. Capital, Lotbinière.

**LOT-ET-GARONNE**, a S. W. department of France, in Guienne, taking its name from its two principal rivers, bordering on Dordogne, Lot, Tarn-et-Garonne, Gers, Landes, and Gironde; area, 2,067 sq. m.; pop. in 1872, 319,289. The surface is an elevated and undulating plain, furrowed with valleys, each occupied by a stream, while the whole department is traversed in a N. W. direction by the Garonne. The soil is generally fertile, but there are sterile sandy districts, or *landes*, in the west, and marshes. Wheat, maize, rye, tobacco, hemp, and fruit are the principal productions. The banks of the streams are generally clothed with vines. Much of the wine is made into brandy. The cork tree is extensively grown, and supplies material for a very important employment, cork cutting. It is divided into the arrondissements of Agen, Marmande, Nérac, and Villeneuve. Capital, Agen.

**LOTHAIRE I.**, emperor of the West, born about 796, died at Prum, Sept. 29, 855. When in 817 his father Louis le Débonnaire shared the empire with his three sons, Lothaire, Pepin, and Louis, the first received the largest portion, and the right of suzerainty over his brothers. In 822 he was crowned king of Italy by the bishop of Milan, and on April 5, 828, he received the imperial crown from Pope Paschal. After the birth of Charles the Bald, and the bestowment upon him of a domain at the expense of his elder brothers, Lothaire excited Pepin and Louis to revolt, and twice dethroned his father, in 830 and 833. He became emperor on the death of his father in 840, but was involved in disputes with his brothers Louis and Charles, and was defeated by them in the battle of Fontenay, June 25, 841. By the treaty of Verdun in 843, he received Italy, Burgundy, and a district in the east of France, which was afterward (from his son Lothaire, its first king) called Lotharingia or Lorraine. During the wars of Lothaire the Normans plundered the coasts of the North sea, the Saracens devastated his Italian provinces, and the clergy and barons greatly extended their power. After dividing his states among his three sons, the emperor became a monk in the convent of Prum, in the Ardennes highlands, and died six days after being received.

**LOTHAIRE II. or III.**, a German emperor, surnamed the Saxon, born near Celle in 1075, died at Bretten, near Trent, Dec. 3, 1137. His father, Gebhard of Arnsberg, fell fighting against the emperor Henry IV., and Lothaire fought on the same side when 14 years of age. He married Richenza, daughter of the duke of Saxony, and soon became actual ruler of the

duchy, though he did not receive the title until the accession of Henry V. He was reconciled for a time to Henry IV., but afterward opposed him again. He aided the accession of Henry V., rebelled against him in 1112, made a humble submission in 1114, but revolted again the same year, and took part in the defeat of Henry at Welfesholz, Feb. 13, 1115. A third rebellion in 1123 was followed by a reconciliation in 1124; and Henry shortly afterward dying, Lothaire was elected to succeed him in 1125, and crowned king of Germany at Aix-la-Chapelle, Sept. 13. The dukes of Swabia and Franconia refused to acknowledge him, but Lothaire made alliance with Pope Innocent II., whose recognition he procured from the assembly at Würzburg in 1130, defeated the duke of Swabia in 1132, and was crowned emperor of the Romans by Innocent in Rome, June 4, 1133. He subsequently drove the antipope Anacletus out of Italy, but on his homeward journey from this expedition he was seized with sickness and died. His reign was marked by the session of the diet of Magdeburg (1135), at which the first regulations of the German empire were framed.

**LOTHARINGIA.** See LORRAINE.

**LOTTERY** (Ital. *lotteria*, a game in which the lot, *lotto*, decides), a sort of gaming contract, by which, for a valuable consideration, one may by favor of the lot obtain a prize of a value superior to the amount or value of that which he risks. In its best and most frequent application, the word describes those schemes of this nature which are conducted under the supervision and guaranty of government, and the proceeds of which are devoted to public objects. Almost all modern states have, at some period of their history, employed lotteries as a means of revenue. But though they supply a ready mode of replenishing the public treasury, they have always been found to exert a mischievous influence upon the people. The poor are invited by them rather than the rich, and are diverted from persistent labor and patient thrift by the hope of sudden and splendid gains; and as it is the professed principle of these schemes to withhold a large part of their receipts, a necessary loss falls upon a class which of all in the community can least afford to bear it. Between the years 1816 and 1828 the French government derived from lotteries an annual income of 14,000,000 francs. A few years later the government suppressed them, and in the following January 525,000 francs more were found to be in the savings banks of Paris alone than in the same month of the preceding year. In other European states government lotteries are still maintained, and they are defended by the argument that as the passion for play is irrepressible among the people, and their money would otherwise be invested in foreign or in secret and less fairly managed schemes, the state may well assume the conduct of lotteries at home; that under its supervision the evils attendant upon them

are diminished, and their earnings are devoted to the public welfare. Similar to the lottery of modern times was the mode sometimes adopted among the Romans in distributing the *congiaria* among the people; instead of the usual direct donations of corn, wine, and oil, tickets were issued which entitled the holders to various shares in these supplies. A closer resemblance is found in the favorite custom of Augustus, which was imitated by his successors, of distributing at his feasts sealed packets (*sortes convivales*), similar in appearance, but containing orders for articles of very different value. The same practice existed among the feudal princes. In the middle ages the same mode was adopted by the Italian merchants in the disposition of their wares. A money lottery, called the *lotto*, was instituted at Florence in 1530 for the benefit of the state; and in Venice a half century later lotteries existed under public control.—Two kinds of lottery may be distinguished, the Genoese or numerical, and the Dutch or class lottery. The former originated in Genoa. The election by lot of five members of the grand council afforded the subject of wager. The names of ninety candidates were thrown into a wheel of fortune, and bets were made upon the result of the drawing. Numbers were afterward substituted for the names of the councillors, and the city undertook the direction of the game. The players fixed upon certain numbers, wagering that one, two, or more of them would be drawn among the five, or that they would appear in a certain order. The lottery maintained itself by calculating nicely, according to the doctrine of probabilities, the chances of success, and then adjusting the prizes so as to insure a profit to the bank. The prizes were larger as the chances of success were less; thus in the class of chances which required two out of the five numbers drawn, one ticket in 400 may win. In Austria, where this sort of lottery is used, the holder is paid with 240 times, and in Bavaria with 270 times the price of his ticket. In the *quaterne*, which requires four of the five numbers, the probabilities of success are as 1 to 511,038; and the winner receives in Austria 60,000 times, and in Bavaria 64,500 times the value ventured. Out of Italy this sort of lottery was first established in Vienna in 1752, and in Berlin in 1763. The origin of the second kind, the class lottery, has been referred to the Roman *congiaria*, already mentioned; but with more correctness probably to the lotteries of merchandise established at several places in Europe during the middle ages, and the invention of Italian merchants. In this species, the number and value of the prizes are regularly estimated, all the ticket holders are interested at once in the play, and chance determines whether a prize or a blank shall fall to a given number. The drawing generally takes place at several different times, and the largest prize is withheld till the drawing of the last class.

The lottery is supported by a fixed percentage deducted from each prize.—The first lottery in France was established in 1539. Francis I. gave his assent to it, on condition of a surrender to the crown of a tax on every lot. It received the name of *blanque* from the white tickets which indicated the blanks. A law promulgated in the 6th year of the republic (1798) prohibited all private or foreign lotteries, and from that date the *loteries nationales* displaced all others. They were instituted in all the large cities. In 1800 three or four drawings took place every week. This government monopoly lasted till 1836. A law of May 21 of that year abolished all lotteries, and included among them all sales of merchandise or other property, movable or immovable, effected by lot, and all schemes whatever offered to the public in which the lot is the principle of decision. The law confiscates the property offered in the lottery, and enforces severe penalties against its agents and managers, whether the scheme be French or foreign. Lotteries of personal property, the proceeds of which are to be devoted to charitable objects or to the encouragement of art, may be authorized by government.—In Germany the first class lottery was opened at Nuremberg in 1699. This kind seems to be the one most used in that country at the present time. The lotteries are controlled by government, and their profits applied to the support of work-houses and similar institutions, or to charitable objects. The principle of the system is to return in prizes the money received, deducting a small profit and the cost of management, which discount amounts usually to about 13 per cent. Money lotteries are most frequent, though lotteries of goods are often offered. The latter are very attractive, because each ticket holder receives some prize, though it be of slight value; they require like all others the approval of government. Whole estates, which have become heavily encumbered, have been sometimes offered as prizes. The premium lotteries of Germany are peculiar to that country. Governments issue proposals for loans, offering to capitalists a small percentage upon the amount furnished, by way of interest, and perhaps a like amount in premiums to be awarded by lot. The hope of winning the prizes secures bidders for the loans at a low return of interest, who would not have supplied the funds at the usual rate.—The earliest English lottery of which there is any record was instituted in 1569. The drawing took place at the west door of St. Paul's cathedral; 40,000 shares were sold at 10s. each. The prizes consisted of plate, and the profits were devoted to the repair of the harbors of the kingdom. During the following century the passion for this sort of gambling rapidly increased, so that in Queen Anne's time lotteries were denounced as "public nuisances." In 1612, by permission of James I., a lottery was drawn for the profit of the Virginia company, and

produced about £30,000. The first parliamentary lottery was established in 1709. From this time onward, during the period in which the English state lotteries were carried on under act of parliament, the usual plan was to distribute in prizes of different magnitudes an amount equal to £10 for each ticket; the profit consisted in the advance upon this value paid by contractors, who sold directly to the people, and often by dividing tickets into parts. The prizes were generally funded in annuities. Thus in 1747, when £1,000,000 was raised by the sale of 10,000 shares, the prizes were paid in perpetual annuities at 4 per cent. In 1778 the number of lottery offices in the whole kingdom was 400. In that year an act was passed obliging every person who kept such an office to take out a yearly license and to pay £50 for it; this measure soon reduced the number from 400 to 41. But the evils which in every country have been found attendant on lottery speculations attracted in 1819 the attention of the English people, and the subject was thoroughly discussed in parliament. The mischievous influences of the system were admitted, but for the time at least all other arguments yielded to that of its necessity as a source of revenue. But in 1823 public sentiment had become so far adverse to the further approval of these institutions, that a lottery was only tolerated in that year because it was to be the last. The act which sanctioned it was accompanied by provisions for the future suppression of lotteries, and for rendering illegal the sale within the kingdom of any tickets or shares of tickets in foreign projects of this character. — In the United States, the lottery has been from the earliest settlement of the country a familiar means of raising funds, which in this country could have been secured in no other mode so easily if at all. The Virginia company, as has already been mentioned, derived a large profit from English lotteries, and the influence of them extended gradually to the eastern colonies; for it is reported that an assembly of ministers at Boston in 1699 denounced the lottery as “a cheat,” and its agents as “pillagers of the people.” Generally, however, lotteries enjoyed a fair reputation, and certainly were soon extensively employed throughout the country, for many important and beneficial purposes. Colleges have been founded, roads made, bridges built, ferries improved, and hospitals erected by the aid of lotteries. In 1833 a society was formed in Pennsylvania which advocated their suppression. In July, 1834, the society issued an address to the public, setting forth its objects and views. It is to the efforts of this society that we should mainly attribute the action of most of the states in prohibiting the further establishment of lotteries. In no fewer than 26 of the states the constitution expressly forbids the legislature to authorize them, and the parties concerned in them are in nearly all the states

subject to the imposition of heavy penalties. The schemes known as art unions are held to be lotteries by express decisions. In the language of the court in New York: “These associations distribute a small number of prizes among a great number of persons. The prizes and blanks are drawn in the same manner as in other lotteries. The intention of these schemes is to sell works of art for more than they can be sold for at private sale, and this is to be brought about by an appeal to the universal passion for playing at games of chance. They have all the attributes and elements of lotteries.” In most of the states the advertisement of foreign lotteries is made a penal offence; but lotteries are still permitted in Kentucky, and in Louisiana a general law prohibiting lottery companies was superseded in 1868 by an act chartering a company, and giving it an exclusive privilege of selling lottery tickets for 25 years.

**LOTUS**, the name of a genus of plants of the family *leguminosa*, and nearly related to the



*Lotus corniculatus*.

clovers. The most common species, *L. corniculatus*, is called in England the bird's-foot trefoil; this has a long perennial root, a decumbent stem abundantly clothed with pinnate leaves of five leaflets, and producing numerous clusters of small yellow flowers; it is a common plant in northern Europe, and in England is regarded as a valuable addition to the true grasses in pasturage. Several varieties are recognized, differing in size and habit, and there is a double variety which is grown in gardens, where it forms a dense, dark green mat, abundantly sprinkled with lively yellow blossoms. Other species furnish pasturage in the south of Europe. *L. Jacobaeus*, from the Cape Verd islands, is sometimes met with as a greenhouse plant; it has upright stems, narrow downy leaves, and produces an abundance of blackish purple flowers.—The name lotus or lotos is used by both ancient and modern writers as applied

to fruits and plants; and as these are all different from those included in the botanical genus so named, great confusion has resulted. Homer (Od. ix. 84 *et seq.*) describes the Lotophagi or lotus-eaters as a people on the N. coast of Africa, who were visited by Ulysses in his wanderings, and who endeavored to detain his companions by giving them the lotus to eat. Whoever ate of this fruit wished never again to depart nor to see his native country. This poetical idea is known also to the Arabs, who call it the "fruit of destiny," which is to be eaten in paradise, and has been exquisitely wrought out by Tennyson in his poem "The Lotos-Eaters." What fruit was referred to by the ancients is not known, but numerous conjectures have been made by authors and travellers, and several widely different plants have been suggested as being the true lotus; no fewer than 11 to which the word is applied are enumerated by Fée (*Flore de Virgile*, Paris, 1822). Some consider that the weight of testimony rests upon the *zizyphus lotus* of Linnæus, which is found indigenous in Tunis and in other parts of Africa. This seems to agree best with the account of Polybius, who describes it as a thorny shrub, which grew in that region of Africa known as Syrtica, with berries of the size of an olive, which were first white and afterward tinged with red, and which had a taste like dates. According to Thomas Shaw ("Travels in Barbary and the Levant," London, 1738), the *lotus arbor* of the ancients appears to be the same plant with the *onnab* or *jujube* of the Arabs, a shrub very common in various parts of Barbary. It has the leaves, prickles, flowers, and fruit of the *zizyphus* or *jujube*, only with this difference, that the fruit here is round, smaller, and more luscious, and the branches are neither so jointed nor crooked. The fruit is still in much repute, tastes something like gingerbread, and is sold in the markets all over the southern districts of that region. Olaf Celsius had so high an opinion of it, that he described it as the *dudaim* (mandrake) of the Scriptures. A species of *zizyphus*, which grows into a large tree, with yellow, farinaceous berries of a delicious taste, was met with by Mungo Park in the interior of Africa; the berries being exposed to the sun and then pounded, the meal was made into cakes for food. (See *JUJUBE*.) Munby (*Flore de l'Algérie*, &c., Paris, 1847) and others consider *nitraria tridentata* as the true lotus tree of the ancients, a shrub found in the deserts near Tunis, producing a succulent fruit of stimulating qualities. The sacred lotus is the *nelumbium speciosum*, a fine aquatic plant, sacred to Osiris and Isis, and regarded in Egyptian delineations as signifying the creation of the world. The Egyptian lotus is *nymphaea lotus*, and the blue lotus of the Nile is *N. cœrulea*, which occurs also in the decorations upon the ancient Egyptian remains; and both these beautiful flowers appear also to be favorite subjects for Chinese art.

**LOTZE, Rudolf Hermann**, a German philosopher, born in Bautzen, Saxony, May 21, 1817. He studied at the gymnasium of Zittau and the university of Leipsic, where he graduated in medicine and philosophy in 1838, and became in 1839 an adjunct professor of philosophy. In 1842 he became extraordinary professor at Leipsic, and in 1844 ordinary professor at Göttingen, which chair he continued to hold in 1874. In his metaphysical speculations he follows Leibnitz and Herbart, though with characteristic modifications of doctrine. His principal works are: *Metaphysik* (Leipsic, 1841); *Allgemeine Pathologie und Therapie als mechanische Naturwissenschaften* (1842); *Logik* (1843); *Ueber den Begriff der Schönheit* (Göttingen, 1845); *Ueber Bedingungen der Kunstschönheit* (1847); *Allgemeine Physiologie des körperlichen Lebens* (1851); *Medizinische Psychologie* (1852); *Streitschriften* (Leipsic, 1857); *Mikrokosmos* (3 vols., 1856-'64); and *Geschichte der Aesthetik in Deutschland* (Munich, 1868 *et seq.*).

**LOUDON. I.** A N. E. county of Virginia, separated from Maryland by the Potomac; area, 460 sq. m.; pop. in 1870, 20,929, of whom 5,691 were colored. The surface is hilly, having the Blue Ridge on the N. W. border. The Kittoctan mountain is in the middle. The soil varies, but a large portion is fertile. It is traversed by the Washington and Ohio railroad. The chief productions in 1870 were 537,026 bushels of wheat, 842,128 of Indian corn, 120,811 of oats, 32,759 of potatoes, 34,519 lbs. of wool, 467,363 of butter, and 8,544 tons of hay. There were 5,572 horses, 5,749 milch cows, 11,475 other cattle, 8,934 sheep, and 14,594 swine; 6 manufactories of carriages, 2 of woollen goods, 17 flour mills, 7 tanneries, and 7 currying establishments. Capital, Leesburg. **II.** An E. county of Tennessee, intersected by the Tennessee river; area, about 300 sq. m. It has been formed since the census of 1870. Portions of it are elevated. The soil is generally fertile, and iron and other minerals are found. The East Tennessee, Virginia, and Georgia railroad traverses it. The assessed value of property in 1871 was \$1,876,541. Capital, Loudon.

**LOUDON, Gideon Ernst.** See LAUDON.

**LOUDON. I. John Claudius**, a Scottish horticulturist, born at Cambuslang, Lanarkshire, April 8, 1783, died in London, Dec. 14, 1843. He was educated at Edinburgh, and in 1803 went to London, where he engaged in landscape gardening, and published several essays on that and kindred subjects. In 1806, with his father, he rented a farm in Middlesex, and subsequently a still larger one in Oxfordshire, where he gave instruction to agricultural pupils. In 1812 he retired with a competency, and made a journey of professional observation in Germany and Russia. In 1814, finding that the greater portion of his property had been lost through injudicious investments, he once more applied himself to landscape gardening,

and undertook the compilation of a large work on horticulture. In order to perfect his knowledge of continental gardening, he visited France and Italy in 1819. In 1822 his "Encyclopædia of Gardening" made its appearance; in 1825 his "Encyclopædia of Agriculture;" in 1829, his "Encyclopædia of Plants" (of which, however, little more than the plan was his own); and in 1838 his "*Arboretum et Fruticetum Britannicum*, or an Account of all the Trees and Shrubs, whether Wild or Cultivated, of Great Britain." This work, the most laborious and expensive of all his literary undertakings, proved a source of great pecuniary embarrassment to its author, involving him in difficulties which preyed on his health and accelerated his death. He produced various other works, among them an "Encyclopædia of Cottage, Farm, and Villa Architecture," which has become a handbook with all rural and suburban builders in England. In 1826 he established the "Gardener's Magazine," which he continued till his death; in 1828, the "Magazine of Natural History;" in 1834, the "Architectural Magazine," suspended in 1838; and in 1836, the "Suburban Gardener." All these he edited simultaneously with the progress of his *Arboretum*, notwithstanding that he had for years suffered under great bodily infirmities, and had lost by disease his right arm and the use of all but two fingers of his left hand, being thus obliged to employ an amanuensis.

**II. Jane**, an English authoress, wife of the preceding, born near Birmingham in 1808, died in London, July 13, 1858. Her father, Mr. Thomas Webb of Ritwell hall, having met with reverses of fortune in building speculations, she turned her attention to literature, and published in 1827 a novel entitled "The Mummy," containing a quasi-prophetic description of the steam plough, which, attracting the attention of Mr. Loudon, led to an acquaintance, which in 1831 resulted in their marriage. Mrs. Loudon contributed to many of her husband's works, and after his death prepared new editions of some of the most important of them. She received a pension of £100 from the civil list for services rendered to science by her husband and by herself. Among the works which she wrote or compiled herself are: "Gardening for Ladies" (London, 1840; new ed., 1849); "Ladies' Companion to the Flower Garden" (1841; 5th ed., 1847); "Ladies' Flower Garden of Bulbous Plants" (4to, with numerous colored plates, 1844); "British Wild Flowers" (1846); and "Botany for Ladies" (1849).

**LOUGH, John Graham**, an English sculptor, born at Greenhead, Northumberland, in 1804. He is the son of a small farmer, and in childhood taught himself drawing and modelling. He went to London, and in 1826 exhibited at the royal academy a bass-relief of "The Death of Turnus," and in 1827 the model of a colossal statue of Milo, which was afterward executed in marble for the duke of Wellington.

From 1834 to 1838 he studied in Italy, executing many commissions for English patrons. Returning to England, he produced numerous fanciful works, and subsequently gave special attention to monuments, portrait busts, and statues. Among his works in these departments are statues of Queen Victoria in the royal exchange (1845) and Prince Albert in Lloyd's (1847). At the world's fair of 1851 he exhibited, among other works, a colossal group, "Satan subdued by the Archangel Michael." Among his monuments are one to Southey at Keswick, one to George Stephenson at Newcastle-on-Tyne (1862), and one to the first Lord and Lady Studley, for which a mortuary chapel was erected in 1874 at Toddington. He has executed life-size statues of many of Shakespeare's principal characters.

**LOUGHBOROUGH**, a market town of Leicestershire, England, on the Midland railway, 9 m. N. N. W. of Leicester; pop. in 1871, 11,588. It has a free grammar and several other schools, a philosophical and a literary institution, and several church of England, Roman Catholic, and dissenting places of worship. The chief manufacture consists of hosiery, especially the kind called patent Angola.

**LOUIS I., le Débonnaire** (the Compliant), or **the Pious**, king of the Franks and emperor of the West, born at Casseneuil, Aquitania, in 778, died at Ingelheim, near Mentz, June 20, 840. He was the son of Charlemagne, received when a child the title of king of Aquitania, and in 813 was associated in the imperial dignity with his father, whom he succeeded in the following year. On his accession he permitted the Saxons, whom Charlemagne had transported W. of the Rhine, to return to their own country. Animated by justice and full of good intentions, he tried at first to reform his own family, the court, the clergy, and the provincial administration; but his vacillating disposition unfitted him for the task, and finally brought misery upon him and disorder upon the empire. In 817, yielding to the request of his sons, he shared with them the government of his vast dominions, giving Aquitania to Pepin, Bavaria to Louis, and Italy to Lothaire. His nephew Bernard, being thus deprived of the latter kingdom, which he had inherited from his father, revolted against him, was defeated, taken prisoner, had his eyes put out, and died in consequence. The emperor, under the impulse of remorse and the reproaches of the bishops, subjected himself to a public penance in a national assembly at Attigny in 822. Having had a fourth son by his second wife, Judith of Bavaria, he formed for him, at the diet of Worms in 829, a new kingdom out of the countries he had already distributed among the three eldest sons; these, being dissatisfied with this arrangement, revolted against their father, whom his partiality to his wife and her reputed paramour Bernard, duke of Septimania, had made unpopular. They seized his person, and had him deposed, while



Judith was confined to a convent. Bernard escaped. The people of Germany stood by the emperor, and in 830 restored him to his throne in a general assembly at Nimeguen. Another revolt broke out in 832, Pope Gregory IV. siding with the insurgents. Louis marched against them, but was betrayed by his own army at Rothfeld, and delivered up to Lothaire, who, without the consent of his brothers, subjected the unhappy old man to indignities, had him brought before a council at Compiègne, over which his personal enemy Ebbo, archbishop of Rheims, presided, charged him with a number of crimes which he was obliged to confess aloud, and finally caused him to be degraded. Louis and Pepin, moved partly by pity, partly by jealousy of their brother, then took their father's part, and restored to him the crown in the states general held at Diedenhofen (Thionville) in 835. The emperor at once forgave Lothaire, who came to make submission. His partiality for his youngest son Charles, to whom he wished to bequeath more than his full share of territory, again involved him in trouble. At the diet of Worms (839), Pepin being dead, the emperor proposed to divide his whole empire between Lothaire and Charles, upon which Louis, aided by his nephew Pepin II., took arms again. The emperor marched against them, but before reaching the rebels he was seized with an illness which proved fatal. With the reign of Louis le Débonnaire commenced the dissolution of the Carolingian empire.—See Bernhard Simon, *Jahrbücher des fränkischen Reichs unter Ludwig dem Frommen* (1874).

**LOUIS IV.**, king of France, born about 921, died in 954. He was the son of Charles the Simple, who was dethroned in 922. During his childhood he lived in England with his mother, a sister of King Athelstane, from which circumstance he was called Louis d'Outremer. Upon the death of Raoul of Burgundy in 936, Hugh, count of Paris, father of Hugh Capet, and William, duke of Normandy, secured to him the crown. He endeavored to free himself from the tutelage of Hugh, and his reign was a continual strife. In 937 he suffered a formidable invasion from the Hungarians. In 939 the inhabitants of Lorraine, who had revolted against Otho I. of Germany, acknowledged the sovereignty of Louis, who had married Otho's sister Gerberge, and this led to war between the two kings, in which the great vassals of France joined Otho, whom they proclaimed king of the Gauls. Louis, having been defeated by Hugh of Paris before Laon in 941, made peace with Otho, giving up Lorraine; and by that emperor's intervention and that of the pope the strife between Louis and his vassals was closed. Upon the death of William of Normandy, Louis became guardian of his infant son Richard, and with Count Hugh tried to deprive him of his patrimony; but Richard's tutor escaped with him to a place of safety, and Louis, visiting Rouen by invitation of the Normans, was

treacherously seized by them. Hugh then declared against him, got possession of his person, and only released him upon receiving Laon as a ransom. Louis, with the help of Otho and Conrad, king of Provence, soon retook Laon, but could bring Hugh back only by the mediation of Otho and the pope. Not long after he was mortally injured by a fall from his horse while chasing a wolf.—His son Lothaire reigned till 986, and was succeeded by his son Louis V., le Fainéant, the last of the Carolingian dynasty, who reigned but a single year under the protection of Hugh Capet, and dying poisoned either by his mother or his wife, both of whom were dissolute women, was succeeded by Hugh, the founder of the Capetian dynasty.

**LOUIS VI.**, the Fat, the fifth Capetian king of France, born about 1078, died Aug. 1, 1137. The son of Philip I. by his first wife, Bertha of Holland, he was pursued by the hatred of his stepmother, Bertrade of Montfort, and obliged for a while to seek refuge in England. In 1100 he was associated in the government with his father, whom he succeeded in 1108. Full of spirit and ambition, he aimed at placing the royal authority upon a solid basis, and waged incessant war against the troublesome vassals of the crown, including his own brother Philip, count of Mantes, the lords of Montlhéry and Coucy, and the counts of Montfort and Montmorency. He tried to secure the duchy of Normandy to William Cliton, son of Robert Courteuse, but failed in the attempt, being defeated at Brenneville in 1119 by Henry I. of England, who had seized upon that duchy. This check would have proved fatal to the power of Louis, had not the clergy armed their parishioners and led them to his support. Peace was finally restored by the council held at Rheims under the presidency of Pope Calixtus II. A few years later, on the death of Charles the Good, Louis invested his favorite William Cliton with the county of Flanders. He had some hand in the communal revolution that distinguished the 12th century, but was guided in this by his interest rather than by any principle, and does not deserve the name of "father of communes" which is sometimes applied to him.

**LOUIS VIII.**, the Lion, king of France, son of Philip Augustus, born in 1187, died at Montpensier in Auvergne, Nov. 8, 1226. Before his accession he went to England by invitation of the barons hostile to King John, but after a struggle against that king and his successor Henry III. (1216-17) was obliged to abandon the contest. He was crowned, with his queen Blanche of Castile, at Rheims, in August, 1223, amid general rejoicings. Refusing the demand of Henry III. of England for the restoration of Normandy, he raised an army to drive the English from the land, and conquered the country N. of the Garonne; but at the instance of Pope Honorius III., and receiving 30,000 marks of silver from Henry, he grant-

ed in 1225 a truce of four years. He now intervened in Flanders between Jeanne, who reigned as queen, and a pretender who claimed to be her father Count Baldwin, who had been imprisoned by the king of Bulgaria, and was supposed to have been murdered. Louis took him prisoner and hung him, and established the influence of France in Flanders. He now led a crusade against the Albigenses, besieged Avignon, and took it in 1226 after a siege of three months. But weakened by sickness in his army and the desertion of many of his lords, he left garrisons to hold his posts and hastened home. He died on the march, poisoned, according to some, by the count of Champagne.

**LOUIS IX.**, king of France, and a saint of the Roman Catholic church, born at Poissy, April 25, 1215, died near Tunis, Africa, Aug. 25, 1270. He was the son of Louis VIII. and his queen Blanche of Castile. His mother was distinguished alike for virtue, intellect, and energy; and on the death of her husband in 1226, when her son was 11 years old, she assumed the regency of the kingdom, and, in spite of the most formidable opposition on the part of the great nobles, governed France with vigor and prudence, and educated her son in the strictest principles of Christian piety. Louis, at the age of 19, was married for political reasons to Marguerite, daughter of Raymond Bérenger, count of Provence, a girl of 12 years; but the queen mother kept the young couple separate till the king was 25. In 1241 the count de la Marche, a powerful vassal of the crown, broke into rebellion, and was assisted by Henry III. of England, who landed with a considerable force at the mouth of the Gironde. Louis marched against the rebels and their English allies, and defeated them at Saintes, which put an end to the war. He treated the vanquished rebels with such clemency and magnanimity that he won their hearts, and had no trouble with his vassals during the rest of his reign. He removed one great cause of the disturbances which had hitherto afflicted the kingdom, and strengthened the national feeling, by enacting that no noble of France should thereafter hold a divided allegiance, many of the nobles until then holding fiefs of both the French and English kings, and adhering to each in turn as suited their views or interests. He enacted also an ordinance called *quarantaine le roi*, which forbade the private redress of injuries for 40 days after they had been committed, and directed that during that interval justice should be administered only by the royal authorities. In 1244 news reached Europe of the conquest of Jerusalem by the Kharemsians, of the treacherous massacre of the Christian inhabitants, and of the defeat and slaughter of the knights templars and hospitaliers, after a gallant struggle near Gaza. These tidings greatly excited Christendom; the seventh crusade was proclaimed at the council of Lyons in 1245, Louis having vowed to take the cross during an illness of which he

nearly died. After extensive preparations, he appointed his mother regent, and embarked in August, 1248, from Aigues-Mortes, a port which he had founded on the Mediterranean, for Cyprus, the appointed place of rendezvous for his forces, composed of both French and English. Thence in June, 1249, he sailed to invade Egypt, at that time the most powerful of the Mohammedan states, whose conquest was considered a necessary preliminary to that of the Holy Land. His fleet of 1,800 vessels carried 3,000 knights and a great army of common soldiers. He landed near Damietta, and, the Egyptian sultan being at the point of death and the kingdom in confusion, no serious opposition was made at the outset; and Damietta, which was then populous and strongly fortified, surrendered without resistance. Louis lingered here for five months, waiting the arrival of a part of his fleet which had been forced by a tempest to take refuge in a Syrian port, and the favorable moment for advance was lost; and when in November the army began to move toward Cairo, its march was impeded by the inundation. The Egyptians rallied in great force, and after a hard-won victory at Mansoorah, in which the king's brother and many other knights were slain, Louis was compelled to retreat toward Damietta, where he had left a strong garrison. His army suffered from pestilence and want of supplies, and being continually harassed by the Egyptians, the king and his forces, about 30,000 in number, surrendered at discretion, April 5, 1250. The Egyptians treated them barbarously, and demanded a ransom of 500,000 livres. Louis replied that he would pay that sum for the liberation of his soldiers, but that a king of France could not be valued for money. He offered Damietta in exchange for himself, and he and the remnant of his followers were liberated on the surrender of that city and the payment of 400,000 livres. He set sail for Acre in Syria, where he remained nearly four years, negotiating with the Mohammedans and vainly waiting for reinforcements from France. A large amount of treasure sent to him by the queen mother was lost at sea, and she herself died in 1252. The king at length, in the spring of 1254, sailed from Palestine with about 500 followers, and reached France after a stormy voyage of ten weeks. After his return he occupied himself actively in the reform of his kingdom, and displayed high qualities as a legislator. He enacted many just and important laws, and greatly mitigated the harshness of the criminal jurisprudence of France. So scrupulous was his conscience even in affairs of state, that by a treaty concluded with Henry III. of England at Abbeville in 1259 he restored to that monarch, against the urgent remonstrances of his ministers and councillors, several conquests of his predecessors to which he thought he had not inherited a just title. In 1261 he refused the crown of Naples and Sicily, offered to him by Pope Urban IV.; but when the same

offer was subsequently made to his brother Charles of Anjou, he suffered that prince to accept it, and furnished him with men and money for the conquest of Naples in 1265. Three years later he began to prepare for a new crusade, and on July 1, 1270, embarked with 60,000 men for Tunis. On landing he formed a camp amid the ruins of Carthage, where he waited in expectation of forming an alliance with the sultan of Tunis, who, it had been rumored, was disposed to embrace Christianity. A pestilence soon broke out among the French, and Louis, whose health had long been feeble, was seized with the disease and died after a fortnight's illness, having before seen one of his sons expire. His other son and successor, Philip III., who was also at the point of death, recovered and saved the remains of the army. Among the important acts of Louis IX. is the pragmatic sanction, issued in 1269, forbidding the levying of moneys for the court of Rome without royal consent.—See Joinville's *Histoire de St. Louis*, edited by Natalie de Wailly (Paris, 1873), and Guizot, *Histoire de quatre grands chrétiens français* (2 vols., Paris, 1873).

**LOUIS XI.**, king of France, the sixth of the house of Valois, and son of Charles VII. by Marie of Anjou, born in Bourges, July 3, 1423, died at Plessis-les-Tours, Aug. 30, 1483. He gave early evidence of a passionate temper and a cruel disposition. In 1436 he married Margaret of Scotland. In 1440 he took part in the aristocratic rebellion known as *la Praguerie*, although he was far from being partial to the nobility. The plans of the insurgents were foiled, and Louis, becoming reconciled to his father, received the province of Dauphiny as his apanage. He participated in several military expeditions, and in 1444 was sent by his father at the head of the "great companies" or *escorcheurs* to aid the emperor Frederick against the Swiss, whom he defeated near Basel, but to whom nevertheless, through policy, he granted favorable terms of peace. On the death of his wife (1445), his hostility to his father's mistress, Agnes Sorel, caused great trouble at court; he is said to have slapped her in the face, and was afterward charged with poisoning her. In 1446 the disagreement between him and the king caused Louis to retire to Dauphiny, which he governed as an independent principality, evincing uncommon administrative talents. In 1451 he married, notwithstanding his father's opposition, Charlotte, daughter of the duke of Savoy. The quarrel between the king and his son, embittered by interested courtiers, came to such a pitch that in 1456 Charles VII. marched against the dauphin at the head of a strong army. The latter escaped to Burgundy, where he was welcomed by his uncle Philip the Good, who treated him with the utmost generosity. From his cousin Charles, count of Charolais, afterward Charles the Bold, he received equal kindness. Although repeatedly summoned to return to France, Louis refused to obey. He was called

to the throne upon his father's death, July 22, 1461. Thenceforth he bent all his energies to the destruction of the aristocracy whom he had once supported against his father, and ultimately to that of the very princes of Burgundy by whom he had been protected. As early as 1465 a coalition of princes, called the league of the public good, among whom were his former friend the count of Charolais, the dukes of Brittany and Bourbon, and the celebrated Dunois, was formed against him, with his own brother, the duke of Berry, at their head. Louis fought a drawn battle with them at Monthéry; but fearing the consequences of a protracted contest, he offered them advantageous terms, giving Normandy to his brother, the cities along the Somme to Burgundy, and offices and pensions to others. The following year, however, he succeeded in rescuing his provinces from the grasp of his antagonists. In 1467 a new league was formed, headed by Charles the Bold, who had become duke of Burgundy. In the hope of conciliating Charles, the king paid him a visit at Péronne, while his own emissaries were inciting the citizens of Liége to rebellion against the duke. He thus placed himself in the power of this fierce prince, who, enraged at the news he received from Flanders, kept the king in confinement for three days, and consented to spare his life only on the most disadvantageous terms. Louis released the duke from all allegiance, gave the county of Champagne to his brother, and was obliged to assist Charles in taking and punishing the very city which he had encouraged to revolt. His only consolation in this circumstance was the vengeance he took upon Cardinal Balue, who had betrayed him; he caused him to be confined for about 11 years in an iron cage. The subsequent policy of Louis was more successful. The treaty of Péronne was declared null and void by an assembly of notables at Tours in 1470, upon which a new revolt broke out; but this was frustrated chiefly by the death of the king's brother, which occurred so opportunely in 1472 that Louis was suspected of having got rid of him by poisoning. Charles the Bold, presenting himself as the avenger of the young prince, invaded the northern provinces of France, but was checked by the heroism of the inhabitants of Beauvais. Upon the death of Charles (1477), Louis at once seized the duchy of Burgundy proper, Franche-Comté, Artois, and the cities along the Somme. Maximilian of Austria, the husband of Charles's daughter Mary, made war upon Louis for the recovery of these possessions. Gaining an indecisive victory at Guinegate (1479), he had finally to yield to the superiority of the king, who by the treaty of Arras (1482) preserved his conquests, partly unconditionally, partly as the dower of young Margaret of Austria, the daughter of Maximilian and Mary, to whom he betrothed his son. Meanwhile he had triumphed over nearly all his other enemies. He had retaken Perpignan

from John II. of Aragon, thus preparing the ultimate annexation of Roussillon and Cerdagne to France; and he had in 1475 concluded with Edward IV. of England the treaty of Pecquigny. But above all he had crushed the most troublesome feudal houses; the count of Armagnac fell in 1473, treacherously murdered; the duke of Alençon was in 1474 thrown into prison, where he died; the great constable Louis de Luxembourg, count of St. Pol, delivered up to Louis by the duke of Burgundy himself, was beheaded in 1475; and finally in 1477 Jacques d'Armagnac, duke of Nemours, met the same fate, after being previously subjected to confinement in an iron cage. By treaties and inheritance Louis secured the rich patrimony of the house of Anjou, including the provinces of Anjou, Maine, and Provence, besides its claims to the crown of the Two Sicilies. He had thus considerably enlarged the royal domain, and prepared the way for the territorial unity of France. More than any of his predecessors, he strengthened royal authority and made his government respected at home; he had a standing army more numerous than any before in existence, and greatly improved the fortified towns. He tried to give regularity to the civil administration, and in order to secure the punctual transmission of orders to all parts of his kingdom, he established in 1464 a permanent service of despatch carriers, which was the foundation of the postal system of France. He improved the administration of justice, especially by creating three new parliaments, those of Grenoble (1453), Bordeaux (1462), and Dijon (1477). He increased public taxes, but part of the revenue was expended in a way to benefit the nation itself; he gave particular attention to improving public roads and canals; fostered the commercial marine; opened new markets for commerce; brought skilful workmen from Greece and Italy, and encouraged manufactures and mining. He favored the great invention of the 15th century by establishing printing offices at Lyons, Angers, Poitiers, Caen, &c.; and contributed to the diffusion of learning by the establishment of universities at Valence, Bourges, Caen, and Besançon. But notwithstanding the services thus rendered to France, and his comparatively mild treatment of the middle classes, he never gained popularity; his craftiness, his perfidious and cruel temper, and his total want of royal dignity, inspired the whole nation with feelings of fear and disgust, amounting to unmitigated hatred. He spent his later years at the castle of Plessis-les-Tours, under the absolute control of his physician Cottier; and shortly before his death he summoned St. Francis of Paula to come to him and intercede for the prolongation of his life. He is said to be at least partly the author of the *Cent nouvelles nouvelles*, a collection of novels mostly borrowed from Boccaccio, and of the *Roxier des guerres*. The *Mémoires* of Comines give the full history of this extraor-

inary prince. He has also been well described in Barante's *Histoire des ducs de Bourgogne*; while Sir Walter Scott in his "Quentin Durward," and Victor Hugo in his *Notre Dame de Paris*, have portrayed him at two different periods of his life.

**LOUIS XII.**, king of France, the eighth of the house of Valois, born in Blois in 1462, died Jan. 1, 1515. The son of Duke Charles of Orleans, and great-grandson of Charles V., he was left an orphan when scarcely two years old, and was educated under the supervision of Louis XI., whose second daughter Jeanne he was constrained to marry in 1476. He disputed the regency of Anne of Beaujeu during the minority of Charles VIII., and succeeded in having himself appointed lieutenant general of the kingdom by the states general held in 1484. Afterward resorting to arms, he formed a powerful league among the nobles, and even secured an alliance with Richard III. of England; but he was defeated at St. Aubin-du-Cormier in 1488, and imprisoned in the castle of Bourges, where it is said he was confined at night in an iron cage. At the end of three years he was released by Charles VIII., and proved a faithful servant to his liberator. In 1494 he accompanied Charles in his expedition to Italy, and was put in command at Asti. He rashly took advantage of this circumstance to enforce his claims to the duchy of Milan, in right of his grandmother, Valentina Visconti; but Ludovico Sforza defeated his plans and besieged him in Novara. The return of Charles VIII. from Naples and the victory of Fornovo (1495) extricated him from his difficult position, and he returned to France with the king. The latter dying without issue in 1498, the crown devolved by right upon Louis, now 36 years of age. On his accession, he generously declared that "the king of France would not avenge the wrongs done to the duke of Orleans," and welcomed even those who had previously opposed him. He gave his confidence to George of Amboise, a well-meaning but short-sighted minister; and while their common efforts tended to promote the internal welfare of France, their foreign policy was injurious to it. Louis, having in 1499 obtained a divorce from his first wife, married Anne of Brittany, the widow of Charles VIII., thus securing the reunion of that duchy to France. He was now in close alliance with Pope Alexander VI., who had granted the divorce, and he undertook to make good his claims upon Milan. At the head of his army, he achieved the conquest of the duchy in a few weeks, took Ludovico Sforza and sent him a prisoner to France, and assisted the pope and his son Cesare Borgia in their territorial aggressions. He concluded in 1500 a secret treaty at Granada with Ferdinand of Aragon, and, sending his army to Naples, shared that kingdom with his ally. But quarrels soon arose between the conquerors, and Gonsalvo de Cordova defeated the French at Seminara, Cerignola, and on

the Garigliano (1503), finally expelling them from southern Italy. In 1504 Anne of Brittany, availing herself of Louis's illness, concluded with Maximilian a treaty at Blois, by which she engaged to give her daughter Claude to the emperor's grandson (afterward Charles V.), with a dower consisting of not only the claims of the French king to Milan and Naples, but the two rich provinces of Brittany and Burgundy. Louis on his recovery broke off this treaty, and, yielding to the wishes of the states general at Tours, betrothed Claude in 1506 to her cousin Francis of Angoulême, heir apparent to the crown. In 1507 he severely chastised the city of Genoa, which had asserted its freedom, and in 1508 formed an alliance with Maximilian, Ferdinand of Aragon, and Pope Julius II., known as the "league of Cambrai," to crush the republic of Venice. The Venetians, conquered by him at Agnadello (1509), were on the verge of ruin, when the pope suddenly went over to their side, and brought about the "holy league," to which Maximilian, Henry VIII. of England, and Ferdinand adhered, in order to expel the French from Italy. The latter, under the command of Gaston de Foix, were at first successful, Gaston gaining three victories in three months; but his death at Ravenna in 1512 arrested their success, and being finally defeated at Novara in 1513, they lost all they still held in Italy. Louis had seduced the Venetians from their allies; but the other confederates made a league at Mechlin, and invaded France; the English routed the French *gendarmes* at Guinegate (1513); and Louis, being moreover threatened by the Swiss and the Spaniards, offered terms to his enemies, and the pacification was settled at Orleans (1514). The king, to secure his arrangements with England, consented to pay a pension of 100,000 crowns to Henry VIII., and to marry that king's sister Mary. A few months later he breathed his last, amid the universal sorrow of his nation, by whom he was styled the "father of the people."

**LOUIS XIII.**, king of France, the second of the house of Bourbon, born at Fontainebleau, Sept. 27, 1601, died at St. Germain-en-Laye, May 14, 1643. He was the eldest son of Henry IV. by Maria de' Medici, and succeeded his father in 1610 when in his ninth year, his mother exercising the regency during his minority. A weak woman and a tool in the hands of her Italian favorites, she was unable to preside over the education of the young king, whose time was spent in useless occupations. In 1615 he married Anne of Austria, daughter of Philip III. of Spain. In 1617 he tired of his mother's favorite Concini, and resolved upon shaking off his yoke. He gave orders for his arrest alive or dead, and Concini was murdered. (See ANCRE.) He intrusted the affairs of state to his own favorite Albert de Luynes, whom he promoted to the rank of great constable. Louis XIII. possessed great personal bravery, which he evinced in 1620 at

the battle of the Pont-de-Cé, where he routed his mother's troops, and in 1621 at the siege of Montauban, which he endeavored to take from the Protestants. He concluded peace with the latter on the death of De Luynes, but was unable to check the disorder which prevailed all over the kingdom. In 1624 he became reconciled to his mother, and appointed as his prime minister her chief adviser, Cardinal Richelieu, behind whom thenceforth the king nearly disappeared; and Richelieu for 18 years controlled the destinies not only of France but of Europe. (See RICHELIEU.) Louis had a sincere appreciation of Richelieu; in spite of all intrigues, and notwithstanding his own dislike of the man, he retained him in power until his death. He more than once placed himself at the head of his armies to support the policy of his minister, and on such occasions deserved general admiration by his valor and sometimes by his military talents; he distinguished himself during the siege of La Rochelle, 1627-'8; in the following year he devised and conducted a most brilliant attack at the Pas de Suze (Susa), against the duke of Savoy; and finally, in 1636, his self-possession and firmness saved France from invasion; he advanced toward the allied army, which had already taken Corbie in Picardy, retook that town, and obliged the enemy to retreat. He liked seclusion, and contented himself with the society of a few friends. Some ladies attracted his attention, Mlle. de Lafayette and Mme. de Hautefort among the number; but such was his reputation that their virtue was never questioned. Music, drawing, and mechanical arts filled such of his hours as were not devoted to hunting and pious reading.

**LOUIS XIV.**, called the Great, king of France, born at St. Germain-en-Laye, Sept. 16, 1638, died in Versailles, Sept. 1, 1715. He was the eldest son of Louis XIII. and of Anne of Austria. His mother had been married and childless for 22 years, and was an object of aversion to her husband. A temporary reconciliation took place toward the end of 1637, and the birth of Louis XIV. in the succeeding year occasioned the greatest demonstrations of joy among the people, who gave to him the appellation of *Dieu-donné* or God-given. He was five years old when his father died, and his mother became regent, with Cardinal Mazarin for prime minister. At the time of his accession France was in a very distracted condition. Laws and jurisdictions were unsettled; many cities and fortresses were held by individuals almost independent of the crown; detached portions of other countries interrupted the natural limits of France and broke its geographical unity; war existed with Spain and Germany, and every part of the frontier was menaced by powerful armies; the finances were scanty and ill regulated, and a general grossness of manners and depravity of morals pervaded all classes. The infant king's amusements were all of a military kind. He de-



lighted in handling arms and in beating drums. His intellectual education was neglected, but much attention was paid to his physical development, and his natural vanity, egotism, and haughtiness were encouraged rather than checked by his mother and his tutors. The avarice of Cardinal Mazarin induced him to stint the allowance and equipage of the young monarch, who slept upon worn and ragged sheets, and had a most unbecoming and insufficient wardrobe. The personal neglect with which he was treated, and the general contempt for the royal authority during the troubles of the Fronde, made a strong impression on his mind at this period, when for several years he was a passive instrument in the hands of an intriguing minister and a factious nobility, often forced to fly before triumphant rebels, and to wander a fugitive over his kingdom. It was not till 1652 that he was able to reside undisturbed in Paris, and the recollection of these scenes of anarchy gave him an excessive love of order and of strong government, and an aversion to the turbulent metropolis which finally led him to transfer the seat of government to Versailles. In 1651, at the age of 13, Louis declared himself of age, and assumed the royal authority. He manifested even at this early period much discernment, but he was extremely ignorant of affairs of state, which had been purposely kept from his inspection. In 1653, under the orders of Turenne, he accompanied the army in a campaign against the rebellious prince of Condé, who was besieging Arras; and the raising of the siege of that city put an end to the contests of the Fronde. In 1659 peace was concluded with Spain by the treaty of the Pyrenees; and in fulfilment of an article of the treaty Louis in 1660 married Maria Theresa, daughter of Philip IV. She was handsome and good-natured, but weak in intellect, and the king had little affection for her, though he treated her with invariable respect and consideration. Mazarin died in 1661, after having ruled France for 18 years. Louis decided henceforth to be his own prime minister; and when he was waited upon after the death of the cardinal by the functionaries of state, and asked to whom they must in future address themselves on questions of public business, the king replied, much to their astonishment, "To myself." His first business was to institute, with the assistance of Colbert, a rigid scrutiny into the condition of the finances. Fouquet, a man of brilliant ability, who had long been minister of finance, had accumulated an enormous fortune by peculation. By order of the king he was arrested, Sept. 5, 1661, brought to trial, convicted, and condemned to perpetual imprisonment. He was succeeded by Colbert, under whose administration order was restored in the finances, the revenue greatly increased, manufactures established, and every species of internal improvement promoted. In foreign affairs, the first act of Louis announced to the

world that henceforth the king of France was determined to make himself respected by his neighbors. In 1661 a quarrel broke out at London between D'Estrades, the French ambassador at the English court, and Vatteville, the Spanish ambassador. The latter claimed precedence of the former on the ground that Spain stood higher than France in the scale of nations. An encounter took place between their respective retinues during a public procession, which resulted in the discomfiture of the French ambassador, whose carriage was broken to pieces, his horses killed, and his son and several of his attendants wounded, while the Spanish ambassador forcibly took precedence in the procession. Louis, when he received the news, immediately ordered the Spanish ambassador at his own court to quit France, recalled the French ambassador from Madrid, and sent a message to the king of Spain declaring that if he did not at once admit the right of France to precedence and make a formal apology for the outrage at London, he might prepare for immediate war. The Spanish monarch yielded to this threat, and sent a special ambassador, who on March 24, 1662, waited upon Louis at Fontainebleau, and, in the presence of all the foreign ministers then resident at the court, declared, in the name of his royal master, that henceforward the Spanish ambassadors should never compete with those of France. The duke de Créqui, French ambassador at Rome, got into a quarrel with the pope's brother and with the papal guards, in which some of the ambassador's servants were wounded and one killed. The pope made such reparation as would have satisfied any of the French king's predecessors; some of the guards were hanged, and the governor of Rome was dismissed from office for not having prevented the riot. Louis, however, demanded ampler atonement, and began to march troops toward the Italian frontier. The pope became frightened, and at length consented to disband his guard, to exile his brother, to send a cardinal to Paris to make a formal apology, and to build a monument in Rome recording the offence and its reparation. The energy and determination displayed by Louis in these affairs made a deep impression on the whole of Europe, and, with the increasing order and prosperity of France, made him greatly admired and beloved at home. His power in his own kingdom was now entirely absolute; his famous saying, *L'état c'est moi*, "I am the state," was literally true. His administration was efficiently supported by accomplished statesmen and great generals. The internal affairs, directed by Colbert, and the department of war, by Louvois, were both in the highest state of order and efficiency; and a powerful navy, commanded by the duke of Beaufort, the grandson of Henry IV., maintained the power of France upon the ocean. The other nations of Europe were at the time distracted and enfeebled by internal evils or

foreign dangers. The careless and profligate Charles II. of England was privately a pensioner of the French king; Spain, though her prodigious empire was yet unbroken in extent, was weakened by dissensions among her ill-compacted constituent kingdoms; Germany was divided by religious animosities; and Holland was torn by internal factions, and was wasting her energies in attempts at conquest in Brazil. In France, on the other hand, the policy of Richelieu and Mazarin, notwithstanding the civil commotions stirred up against the latter by the turbulent leaders of the Fronde, had at length completely triumphed, and there was no longer among either the people or the aristocracy any serious opposition to the royal authority. The ability unexpectedly displayed by the king, the grace and dignity of his person, the weariness which the nation felt of civil contentions, the change from poverty and distress to prosperity and abundance produced by the reforms in the finances, and the humiliation of Spain and the pope, all tended to increase the power of the crown and to render the people submissive and contented. The nobles, whose turbulence and feudal independence had been hitherto the chief check upon the royal power, now turned courtiers and vied with each other in flattery and subserviency; and devotion to the king became as much a fashion as opposition to the court had been in the times of the Fronde. The king, with the aid of Colbert and other able ministers, made great and successful efforts to advance the industries of his kingdom, to improve the roads and means of travelling, and to foster literature, science, and the arts. A large proportion of the great monuments of France had their origin in his reign; among others, the stupendous harbors, ship yards, and fortifications of Brest, Rochefort, Lorient, Havre, Dunkirk, Cette, and Toulon; the canal of Languedoc, which unites the Atlantic with the Mediterranean, was constructed by his orders. In 1663 the academy of inscriptions and belles-lettres was founded, and in 1666 the academy of sciences, and eminent foreign men of science were invited to take up their abode in France. Cassini was called from Italy, Huygens from Holland, and Roemer from Denmark. An observatory was erected at Paris, and apartments were assigned to the academy of sciences in the palace of the Louvre. An academy of painting and sculpture was also founded at Paris, and in 1667 the French academy of art was established at Rome for the benefit of young French artists. Every man distinguished in letters or in art was rewarded with substantial benefits; large sums were set apart for increasing the royal library; men of learning and discrimination were sent to every part of the world to collect books, manuscripts, and antiques; and 19 professorships were founded in the royal college. Many of the narrow and dark streets which deformed Paris were cleared away, and splen-

did buildings erected in their stead, while almost the whole of the city was repaved and relighted, and it soon became the most cleanly, orderly, and secure capital in Europe. Reforms of still greater importance were made by the promulgation, in 1667, of the famous *ordonnance civile*, which created a great and beneficial change in the whole body of French law, and swept away a mass of abuses and absurdities which had been accumulating for ages. This was followed by an improved criminal code in 1670, and subsequently by the regulation of commercial law and by the abolition of local jurisdictions belonging to the great nobles.—In his foreign policy, Louis purchased Dunkirk from Charles II. of England for 5,000,000 livres in 1662, covertly aided Portugal against Spain in 1665, notwithstanding his treaty obligations to the latter power, concluded a commercial alliance with Holland in 1666, and aided that republic against England during the war of 1665–7. At the same time his fleet in the Mediterranean swept that sea of the Barbary pirates, and humbled the Algerines, who were compelled to set free their Christian slaves. After long negotiations with the duke of Lorraine, Louis himself in 1667 marched into the territories of that prince and forced him to cede the town of Marsal to France. In 1665 Philip IV. of Spain died, and Louis raised a claim to the Spanish possessions in the Netherlands on behalf of his wife, the daughter of Philip. In support of this claim he suddenly invaded Flanders at the head of an army of 35,000 men, and in three weeks had taken a dozen important towns, including the strongly fortified city of Lille, which after a siege of nine days had surrendered to Louis in person. These rapid conquests alarmed the whole of Europe. A triple alliance was formed, Jan. 23, 1668, between Holland, England, and Sweden, for the purpose of obliging France and Spain to make peace. Louis, however, continued his career of conquest, and in February, 1668, Franche-Comté was invaded by an army led by the great Condé assisted by the king, and in 14 days the whole of that province had submitted. The commissioners of Sweden, Holland, and England now met at Aix-la-Chapelle with those of France and Spain, and a treaty was signed, May 2, 1668, by which the important and strongly fortified territory known afterward as French Flanders was retained by Louis, and Franche-Comté, which was entirely surrounded by his own dominions and was at his mercy whenever he chose to take it, was restored to Spain. Louis now endeavored to break up by diplomacy the coalition against him, which had extended to the German states. The electors of Cologne and Hanover, the bishops of Münster, Osnabrück, and Strasburg, and the king of Sweden were gained over, and Spain itself was partially conciliated. The great object of his policy at this time, however, was to detach England from her alliance with Holland, in order that his

growing navy might not be crushed by the power of the two chief maritime states of Europe. This was effected by bribing the English cabinet, and by playing off upon Charles II. not only the seductions of French gold, but the influence of his sister Henrietta, the duchess of Orleans, and the charms of Mlle. de Quérouailles, who afterward became the notorious duchess of Portsmouth. On May 22, 1670, a treaty was signed at Dover, by which the king of England became a pensioner of France, and promised to make war upon his ally the Dutch republic. In the same year Louis resumed military operations by taking possession of Lorraine. In 1672 Charles began his promised war on the Dutch by an attack upon their Smyrna fleet as it was passing through the English channel. Louis in person invaded Holland at the head of 100,000 men, accompanied by Turenne, Condé, Vauban, and Louvois, and speedily made himself master of three provinces and 40 fortresses. He behaved throughout the campaign with marked clemency to his prisoners and to the peaceful population. No plunder was permitted, and whatever was taken for the use of the army was amply paid for. His activity and courage were also conspicuous. He frequently exposed himself to the fire of the enemy, went to bed late, rose at 3 A. M., and gave almost every moment to the performance of his duties as king and general. The Dutch, alarmed at the rapid progress of the French, sent deputies to sue for peace. Louis demanded an indemnity of 20,000,000 livres, the cession of extensive territories, the public exercise of the Catholic religion throughout the United Provinces, and other severe and humiliating conditions. The ancient spirit of the Dutch rose at these demands, and they resolved to perish rather than submit. The grand pensionary De Witt, who counselled submission, was torn to pieces by the people. William of Orange was elected stadtholder and commander-in-chief, and the dikes which shut out the ocean were cut in several places, covering the country with water, which, though it ruined the land, effectually impeded the progress of the invaders. Preparations were also made to transport in the last emergency the whole nation to the East Indies. In the mean time formidable alliances were rapidly forming against France. The emperor of Germany sent 20,000 men under Montecuculi to join the great elector of Brandenburg, the founder of the military power of Prussia, who had already taken the field with 30,000 troops for the relief of Holland; Spain herself was making exertions for the same purpose, and had raised 15,000 men to reinforce the prince of Orange; and even the debased English court, pressed by the murmurs of the people, who could not see with indifference a Protestant country conquered by a Catholic monarch, began to waver in its subserviency. Louis, leaving Vauban to fortify the places he had taken, hastened to

Paris to devise measures to counteract the combinations against him. He provided with prompt vigor for the preservation of his conquests and for the defence of his eastern frontier against the Germans. A war of several years followed, in which the French armies, led by Turenne, Condé, Luxembourg, and other great generals, combated more or less successfully against the forces of half Europe. Louis himself, in June, 1673, commanded at the siege and capture of Maestricht; and in 1674 he led an army to the conquest of Franche-Comté, which was now permanently annexed to France. In this year the devastation of the Palatinate by the army of Turenne, under orders from the minister Louvois, brought upon Louis general execration. In 1676-'8 the king made brilliant campaigns in Flanders, and took in person the towns of Condé, Bouchain, Valenciennes, Cambrai, Ghent, and Ypres. The war was at length terminated by the treaties of Nimeguen, concluded in 1678 and 1679, by which Louis retained Franche-Comté, French Flanders, Alsace, and some of his conquests on the Rhine. The negotiations were in great part carried on directly by himself, and his letters during their progress exhibit great diplomatic ability. He did not suffer Europe to remain long at peace. In 1680 he advanced claims to various German territories, and in September, 1681, seized by force upon the important city of Strasburg. This led to war with the German empire and with Spain, resulting in the acquisition by France of the town and territory of Luxemburg, which were confirmed to Louis by the treaty of Ratisbon, August, 1684. The prince of Orange was unwearied in his efforts to array Europe in opposition to the French monarch, whose schemes of aggrandizement were now clearly manifested; and in 1686 the league of Augsburg was formed, by which Holland, Austria, Spain, Bavaria, and Savoy formed a coalition against France. Louis prepared with his usual energy for the contest, which he began himself in September, 1688, by invading and overrunning the Palatinate, which was again desolated with fire and sword in the most cruel and barbarous manner. These atrocities, however, like those of the former war, were committed by order of Louvois, and were strongly condemned by the king when they came to his knowledge. In the war that ensued, his armies, no longer led by Condé and Turenne, met with severe reverses. Colbert had died in 1683, and France was beginning to feel seriously the immense expenses of war, carried on as it was by Louis with standing armies of a magnitude unknown in Europe since the days of the Romans. The treasury was exhausted, and to replenish it the king and the principal nobles sent their plate to the mint, and various other extreme means were resorted to. As the war advanced, the military genius of the duke of Luxemburg redeemed the honor of the French arms at Leuze, Steenkerk, Neerwinden, and in other battles.

The English revolution of 1688 had raised to the throne of Great Britain the prince of Orange, the ablest and most determined of the enemies of Louis, and had added the forces of that kingdom to the coalition against France. The war continued with mingled success and reverses on the part of Louis till September, 1697, when it was terminated by the peace of Ryswick. By the treaties here made, Louis granted to the Dutch extraordinary commercial privileges, and regained from them Pondicherry in India; to Spain he restored his conquests in Catalonia, and a large part of Flanders, with many strong fortresses; to the Germans he restored all that he had taken; he gave up Lorraine to its legitimate sovereign, and lastly recognized William III. as king of England. Charles II. of Spain died Nov. 1, 1700, and, having no heir, left his crown by will to Philip, duke of Anjou, grandson of Louis, a testament accepted by the French king, with the ominous remark that "the Pyrenees no longer existed." This event set all Europe in commotion, and led in the following year to the war of the Spanish succession, Austria, England, Holland, Prussia, and Hanover having formed an alliance against France. This great struggle was in the end eminently disastrous to Louis, who saw his armies defeated by Prince Eugene, Marlborough, and others, his fleets destroyed, his kingdom invaded, his resources exhausted, and France distressed by famine, caused by the most rigorous winter ever known in Europe. He therefore sought for peace, and after rejecting with haughty disdain the severe and humiliating conditions at first demanded by the triumphant allies, succeeded by skilful diplomacy in effecting the treaties of Utrecht, April 11, 1713, with Holland and England, and in the following year the treaty of Rastadt with the German empire. These were the last important events in the foreign policy of the reign of Louis. In the internal history of France, the most striking events were the outbreak of poisoning in Paris (for an account of which see BRINVILLIERS); the tragical death of Henrietta of England; the revocation of the edict of Nantes, Oct. 22, 1685, and the subsequent persecution of the Protestants, which was accompanied with frightful barbarities, and cost France half a million of her most industrious inhabitants, who fled to different parts, taking with them their skill and industry; the revolt of the Camisards in 1703; the building of the magnificent palace of Versailles; and the singular and mysterious detention of the man in the iron mask. During the greater part of his reign the mistresses of Louis XIV. played an important and often a conspicuous part in the affairs of his brilliant court. The most noted of these were the duchess de La Vallière and the marchioness de Montespan, by both of whom he had several children, who were acknowledged and legitimated. His queen, Maria Theresa, died July 30, 1683, and in the year 1685 or 1686 Louis was privately

married to Mme. de Maintenon, whom he had in vain sought to make his mistress, and who exercised over him a powerful influence which ended only with his life.—The reign of Louis XIV. has been styled the Augustan age of France, and it will certainly ever be illustrious from the splendid array of great men whom the king assembled around his throne. We have already mentioned his great ministers Colbert and Louvois. Among his generals, besides Turenne, Condé, and Luxembourg, were Catinat, Créqui, Boufflers, Montesquiou, Vendôme, and Villars, all of them eminent soldiers; his distinguished naval commanders were Château-Renaud, Duquesne, Tourville, and Duguay-Trouin; Molé, Lamoignon, Talon, and D'Aguesseau were among the civilians of his reign; Vauban and Riquet were his engineers; Ferault, Mansart, Blondel, and Leveau his architects; Lenôtre his landscape gardener; and Puget, Girardon, Poussin, Claude Lorraine, Lesueur, Le Brun, and the two Mignards were among his sculptors and painters. In the list of the literary notabilities of his reign are the names of Corneille, Racine, Molière, Quinault, La Fontaine, La Bruyère, Boileau, Bossuet, Bourdaloue, Massillon, Fénelon, Flécher, Fleury, and Mme. de Sévigné, most of whom still hold a place in the foremost rank of French authors. At an early period of his reign Louis XIV. established at his court a most rigid system of etiquette, which he always maintained with jealous care. He rose at 8 o'clock, performed his devotions, and was dressed by his valets in presence of a crowd of courtiers, and then read for an hour, at the close of which time he breakfasted. He left his chamber at 10, attended the council, and heard mass at 12. From noon until 1 o'clock he appeared in public. At 1 he dined, seated alone at the table, and waited on by the highest officers of the court. After dinner he spent some time with the royal family, and then held conferences with his ministers; afterward he received petitions and gave audiences, during which he exhibited great urbanity and patience. The rest of the afternoon was spent in conversation, in driving, at the theatre, or the card table. At supper, which was his favorite repast, he collected about him all the princesses and their ladies of honor, and passed the evening in conversation and amusements. In person the king was about 5 ft. 8 in. in height, but had the art by his dress and carriage to appear much taller, and was universally admired by his contemporaries for his majestic air. His features were large and handsome, and his manner singularly grave and commanding. In the latter part of his life he devoted much time to his religious duties. His old age was embittered by the reverses of his armies, by the deaths of his children and grandchildren, and by remorse for the vices of his early life. His last words to his great-grandson who succeeded him were: "My child, you are about to become a great king; do not imi-

tate me either in my taste for building or in my love of war. Endeavor, on the contrary, to live in peace with the neighboring nations; render to God all that you owe him, and cause his name to be honored by your subjects. Strive also to relieve the burdens of your people, which I myself have been unable to do."—The most noted French works upon this reign are Voltaire's *Siècle de Louis XIV.*, St. Simon's *Mémoires*, and *Louis XIV. et son siècle*, by Alexandre Dumas. See also "Louis XIV. and the Court of France in the 17th Century," by Miss Pardoe (London, 1847).

**LOUIS XV.**, king of France, great-grandson and successor of the preceding, born in Versailles, Feb. 15, 1710, died there, May 10, 1774. He was the third son of Louis, duke of Burgundy, and of Maria Adelaide of Savoy. He bore at first the title of duke of Anjou, and afterward, his elder brothers having died, of dauphin. The will of Louis XIV. had provided that during the minority of his successor the kingdom should be governed by a regency, with the duke of Orleans, cousin of the young king, at its head. The duke, however, induced the parliament of Paris to set aside the will and declare him sole regent as first prince of the blood. The regent at first restored to the parliament some of the rights which it had lost in the preceding reigns, and took measures to promote agriculture, commerce, and the other public interests. Though the intrigues of Cardinal Alberoni, the ambitious and able Spanish minister, drove France into war with Spain (1719-'21), the policy of the regent was on the whole pacific. He engaged with eagerness in the financial and commercial schemes of Law, which finally threw the country into confusion and produced almost universal bankruptcy. (See LAW, JOHN.) In 1723 Louis was declared to be of age, and the regent became prime minister; but he died the same year, and was succeeded by the duke of Bourbon, and he in turn by Cardinal Fleury, who had been tutor to the king in childhood, and had won the love and confidence of his pupil. In September, 1725, the king was married to Maria Leszczyński, daughter of Stanislas, ex-king of Poland, a princess of little personal beauty, but of amiable disposition and most exemplary and pious life. The policy of Fleury was even more pacific than that of the duke of Orleans. He was so averse to war, that even when compelled to undertake it he carried it on without vigor and with most reluctant acquiescence in the necessary expenditures. He labored incessantly to preserve peace among his neighbors, and hostilities in Europe were repeatedly averted by his mediation. In 1733 Augustus II. of Poland died, and Stanislas, the father-in-law of Louis, claimed the vacant throne. His pretensions were supported by France, and those of Frederick Augustus of Saxony by Austria and Russia. This led to war (1733-'5), in which the French armies won several victories; and

though Stanislas failed to recover the kingdom of Poland, he acquired the duchy of Lorraine. The war was closed by the treaty of Vienna, Nov. 18, 1738. On the death of the emperor Charles VI. of Germany in 1740, Louis, who had some claims himself to the succession, maintained the claims of Charles Albert, elector of Bavaria, against those of Maria Theresa, who was supported by England. The French armies were at first beaten and driven out of Bohemia and Bavaria, and the navy, which had been neglected by the parsimonious Fleury, suffered greatly from the English fleets. Louis himself took the field in May, 1744, and the genius of Marshal Saxe restored the honor of the French arms in the victories of Fontenoy, Raucoux, and Lawfeldt, by which the Austrian Netherlands were almost entirely conquered (1745-'7). The war was ended by the peace of Aix-la-Chapelle, Oct. 18, 1748, and resulted in no gain to France but military fame, though the treaty gave her back Louisburg in America, which had been taken by the New Englanders in 1745. For several years after his marriage Louis had shown a regard for chastity and decency unusual among the monarchs of Europe at that period; but about 1737 his profligate courtiers had systematically exerted themselves to corrupt his principles and his life. They ultimately succeeded, and Louis plunged into the grossest debauchery. Multitudes of ladies became suitors for the royal favor, and the highest nobles of France emulated each other in their endeavors to have the honor of pandering to the appetites of the monarch. The queen was wholly neglected, and the history of the government soon became intimately connected with the changes of the king's mistresses. The most noted of these were Châteauroux, Pompadour, and Du Barry. The debaucheries of the king culminated at length in the establishment at Versailles of the *parc aux cerfs*, or deer park, as it was facetiously called, a harem in which were kept for the pleasures of the king a number of young girls enticed or torn from their homes by the royal agents. They were changed in rapid succession, and Louis spent much of his time in teaching them to read and write, and in instructing them in religious matters. He was in the habit of praying with them, and after he became tired of their charms took pains to have them married, and gave them each a considerable dowry. In 1756 disputes with England about the boundaries of the French and English territories in America resulted in the seven years' war (1756-'63), in which France lost Quebec and Canada by the victory of Wolfe over Montcalm, Sept. 13-18, 1759, lost India by the victories of Clive, and lost her navy by the victories of Hawke and other English admirals. The French armies were beaten at Rossbach and at Minden; and at last, by the peace of Paris, in February, 1763, France ceded to England Canada, Nova Scotia, all the rest of her possessions in North America east



of the Mississippi, and the islands of Grenada, Dominica, and Tobago in the West Indies. She came out of the contest humiliated and disgraced, with her finances exhausted and her foreign commerce nearly destroyed. During the war an attempt by a fanatic named Damiens to assassinate the king revived for a time the popularity of Louis; but the unfortunate issue of the contest and the ensuing distress tended much to alienate the people from the crown. Internally the kingdom was greatly disturbed by contests between the ecclesiastical and civil authorities, growing out of attempts on the part of the clergy to enforce the papal bull *Unigenitus*, which were resisted by the parliaments. The king was at length induced to banish the Jesuits, whose quarrel with the Jansenists had fomented these dissensions. The parliament of Provence having issued a decree depriving the pope of Avignon and the county of Venaisin, which had long belonged to the holy see, Louis seized those territories in 1768. In the same year Genoa ceded Corsica to France, though the French troops did not succeed in subduing the island till the following year. The rest of this reign was occupied by struggles between the king and the parliaments, in which the royal authority finally triumphed. Louis, however, did not long enjoy his triumph. A young girl with whom he had a transient amour communicated to him the smallpox, which, together with a shameful malady from which he was already suffering, caused his death in a few days. His personal vices and his misgovernment had prepared the way for the overthrow of the monarchy, which carried with it to destruction his successor. Louis XV. was himself fully aware of the perilous state of the kingdom, and his only anxiety in his latter years was that the tottering fabric should last as long as he did. His lusts and extravagances and his needless and costly wars had exhausted the treasury and increased the burden of debt and taxation; and as all the taxes and imposts pressed entirely upon the citizens and peasants, while the wealthy nobles and the clergy were exempt, the middle classes were heavily burdened, especially as the government did not collect the revenues itself, but sold them to the extortionate and unscrupulous farmers general. In the midst, however, of the national distress and the general confusion of affairs, a great intellectual movement was apparent in France during this reign, and the third estate, as the middle classes were called, gradually acquired by its wealth and intelligence a considerable degree of social and political influence. A spirit of boldness, mingled with levity in thought and intellectual speculation, was strikingly manifested in conversation and literature. Everything was doubted, everything attacked, and the shameless corruption which pervaded both church and state provoked a criticism whose searching inquiry spared neither religion nor

social order nor the political organization of the country. The skeptical tendency of the times manifested itself in great writers like Voltaire, Rousseau, Diderot, D'Alembert, Condillac, and Helvétius, and in works like the great *Dictionnaire encyclopédique*, which produced an immense agitation in the public mind. The excesses of the court and of the clergy, exposed and satirized by the wits and authors, debased the monarchy and the church in the eyes of the people, and brought about an intellectual revolution, which was the precursor and the cause of the political revolution which took place in the succeeding reign.

**LOUIS XVI.**, king of France, grandson and successor of the preceding, born in Versailles, Aug. 23, 1754, guillotined in Paris, Jan. 21, 1793. He was the third son of the dauphin Louis and of Maria Josepha, daughter of Frederick Augustus, king of Poland and elector of Saxony, and became heir presumptive on the death of his father in December, 1765. He had a vigorous physical constitution, and his features were not without dignity; but he was awkward, reserved, taciturn, and without decision of character, and in public his diffidence prevented him from doing justice to himself. He was industrious, quick of comprehension, and had an extraordinary memory; but was intentionally kept from acquaintance with affairs of state, though while dauphin he read much and wrote somewhat on historical matters, and was familiar with geographical and chronological details. He had a fondness for mechanical pursuits, learned the trade of a locksmith, and took much interest in the mechanical part of printing. He printed himself, in 1766, 35 copies of *Maximes morales et politiques tirées de Télémaque*, which he had collected from Fénelon's romance; and he made also a translation of some portions of Gibbon's "Decline and Fall," which was published under the name of Le Clerc de Sept-Chênes, who was his reader. On May 16, 1770, he was married to Marie Antoinette, archduchess of Austria; and on May 10, 1774, he became king by the death of his grandfather Louis XV. He appointed the aged count de Maurepas his minister of state, and Turgot minister of finance. Sartine, Malesherbes, and the counts of Vergennes and Saint-Germain were also made members of the cabinet. Various reforms were introduced, chiefly through the exertions of Turgot, and the most offensive feudal services and imposts were abolished in spite of a strong opposition on the part of the nobility. The people were conciliated by the recall of the parliaments, Nov. 12, 1774. The king set the example of economy and retrenchment by reducing his household expenses and the number of his guards. An edict declaring the internal trade in grain free, and the occurrence of a partial famine at the same time, produced serious riots, in the suppression of which several hundreds were killed by the military. The king on this occasion, though at first irreso-

lute, showed at length both vigor and prudence, and the disturbances were quieted by the amnesty of May, 1775. In the following year the opposition to reform, supported by the queen, succeeded in effecting the withdrawal of Turgot from the cabinet; and after various changes the finances were at length intrusted to the celebrated Necker, from whose skill and talent the highest expectations were entertained. When the war of the American revolution broke out, and the agents of the United States, Franklin and Deane, arrived in Paris to solicit aid for the struggling colonies, Louis, though sympathizing with the Americans, was averse to embarking in war on their account; but his pacific inclinations were at length overcome by the urgency of his ministers and of the queen, and by the enthusiasm of the court and people, and on Feb. 6, 1778, he concluded the treaty of alliance with the United States, which in a few months resulted in the declaration of hostilities between France and Great Britain. The war cost France about 1,400,000,000 livres; and besides the irreparable deficit it produced in the already disordered finances, it tended greatly to weaken the monarchy by diffusing republican and revolutionary ideas. Necker became by his attempts at reform so obnoxious to the court and the aristocracy that he was obliged to resign in 1781. He was succeeded, after some changes, by Calonne, whose extravagance was unbounded. The queen and the court gave themselves up to gayety and profusion, excepting the king, whose tastes were simple and moderate, and who refused himself expensive indulgences which he granted to the queen and the princes. In 1785 a swindling trick by which, in the name of the queen used without her knowledge, a jeweller of Paris was defrauded of a diamond necklace of immense value, created much excitement, threw great scandal on the queen and court, and disgraced the throne in popular estimation. (See LAMOTTE-VALOIS.) At length the king was persuaded to convene the assembly of the notables or principal nobility of the kingdom, for the purpose of devising some means of raising money, the deficit in the finances having reached the sum of 140,000,000 livres. The notables met in February, 1787, but rejected the proposal of a universal taxation which should embrace both the nobles and the clergy, upon which Calonne resigned. His successor, Loménie de Brienne, was not more successful in grappling with the difficulties which beset the state, and was compelled to resign at a time when the scarcity of money had become so great that all cash payments were suspended and a state bankruptcy appeared inevitable. Necker, who was exceedingly popular, was recalled to the ministry in 1788; and the states general, which had not met since 1614, were summoned, and assembled at Versailles, May 5, 1789. An order of the king fixed the number of noble and ecclesiastical members at about 300 each, and that

of the third estate or citizens at about 600. A quarrel broke out between the three estates at their first sitting, the main question at issue being whether the estates should vote separately or all together. In the former case, the house of nobles would have the power of preventing any action displeasing to them; in the latter, the third estate, or commons, themselves forming half of the whole number of members, and who were also sure of the concurrence of many of the clergy of the inferior orders, would have the absolute power in the assembly. After a contest of some weeks the third estate declared itself (June 17) to be the national assembly, and was joined by portions of the other estates. The assembly began immediately a series of financial reforms which excited the greatest enthusiasm throughout France. Necker prepared a plan of a constitution for a limited monarchy like that of England; but the nobility persuaded the king to consent to violent measures, and on June 20 the hall of the assembly was closed by military force. The members, however, met in an adjoining tennis court and unanimously took an oath never to separate until the constitution of the kingdom and the regeneration of the public order were established on a solid basis. On June 23 a royal sitting was held, and Louis from the throne made a speech to the assembly, and proposed various important reforms and the establishment of constitutional rights, securing the liberties and privileges of the people. His concessions were received with coldness, and after the termination of the sitting he dissolved the assembly. The third estate, however, refused to be dissolved; and one of its most prominent members, Mirabeau, replied to the official who summoned them to obey the king: "Tell your master that we sit here by the power of the people, and that we are only to be driven out by the bayonet." The king yielded to this resolute resistance, the assembly remained in session, and the nobility and clergy, who had accepted the mandate of dissolution, now returned and took their seats at the request of the monarch. During these proceedings great excitement prevailed among the people of Paris. A national guard was formed, embracing nearly all the citizens capable of bearing arms, with Lafayette for commander, and the government of the city became a democratic municipality with Bailly for mayor. The irresolute king was now persuaded to dismiss Necker and banish him from the kingdom, and to surround Paris with a powerful army commanded by Marshal Broglie. Paris, exasperated at these reactionary measures, rose in insurrection and stormed the Bastille on July 14. The king was startled and dismayed, and meditated flight beyond the frontier, though he did not yet fully appreciate the dangers of his position. The next morning Louis, who had a horror of bloodshed, and would not use the force at his command, made his appearance in the national assembly, which

he addressed for the first time by this title. He came without his guards, accompanied only by his two brothers. He made a speech which for a while restored popular confidence, assuring the assembly that its freedom should be saved, though he had with his usual infirmity of purpose already signed the order for the army to advance upon Paris. On July 17, accompanied by the national assembly, he visited Paris, and was conducted through a mob of 100,000 armed men to the hôtel de ville, where he showed himself to the people, wearing on his breast the tricolor, which had recently been adopted as the revolutionary emblem. He was then reconducted to Versailles amid the strongest demonstrations of popular attachment. On the day of the king's entry into Paris the princes of the blood, except Monsieur (afterward Louis XVIII.), and the chiefs of the aristocratical faction fled from the kingdom. They were followed by large numbers of the nobles and by the ministry, whom the assembly had impeached. At the same time Necker was recalled, conducted to Paris in triumph, and reinstated in his office. From this period the revolution went rapidly onward. An imprudent outburst of loyal enthusiasm among the officers of the troops stationed at Versailles produced a sudden commotion in Paris, and a furious mob marched (Oct. 5) from that city to Versailles, where they took possession of the royal palace, and after committing great outrages compelled the king, queen, and royal family, who had narrowly escaped massacre, to return with them to Paris, where they were permitted to occupy the Tuileries, which was strictly guarded to prevent their escape, and Louis remained a virtual prisoner till the following year. On July 14, 1790, he took part in the imposing ceremony of the confederation in the Champ de Mars, where in presence of half a million of spectators he swore to be faithful to the constitution which the national assembly was then preparing. After this, however, his situation grew constantly worse. Necker, unequal to the difficulties of his post, retired to Switzerland. Mirabeau, who had been won over partly by bribery to the side of the king, died, and with him fell the last hope of the monarchy. The king, to test the degree of restraint to which he was subject, endeavored in April, 1791, to pay a visit to his palace of St. Cloud, but his departure from the Tuileries was prevented by the mob. He now determined to make his escape from this disgraceful thralldom, and from the violence, insult, and danger to which he was continually exposed in Paris, and, calling around him at some place on the frontiers such subjects as were yet loyal, make a stand against the tyranny of the assembly and the mob. In concert with the marquis de Bouillé, an able and resolute general, who commanded a body of loyal troops in Lorraine, a plan was at length formed for the flight of the whole royal family to Montmédy on the northern frontier, about 200 miles from Paris. It was

put in execution June 20, and failed of success chiefly through the obstinacy and want of common sense of the king himself, who could not be persuaded to make use of common carriages, but had a peculiar coach built for his own use, which attracted attention, and who besides did not on his journey take care to keep himself concealed from observation. He was recognized by the assistant postmaster Drouet at Ste. Menehould, stopped by the national guards at Varennes, 150 miles from Paris, and brought back to the capital a prisoner, accompanied by the stern Pétion, and by Barnave, who now became a defender of the throne. On the morning after his return a decree of the national assembly provisionally suspended him from his functions as king, and a strict guard was placed over him and the royal family. In September the new constitution was submitted to him for acceptance, his freedom being previously restored to him. After several days' examination he sent this message to the assembly, Sept. 13: "I accept the constitution; I engage to maintain it alike against civil discord and foreign aggression, and to enforce its execution to the utmost of my power." On the following day he repaired in person to the assembly to declare his acceptance, and on Sept. 29 he attended the closing session of the assembly and delivered a speech in which he said: "Tell your constituents that the king will always be their first and best friend; that he has need of their affection; that he knows no enjoyment but in them and with them; that the hope of contributing to their happiness will sustain his courage, as the satisfaction of having done so will constitute his reward." For a brief period after this Louis had a certain degree of peace and even of popularity; but his vetoes upon the decrees against the emigrant royalists and the priests who would not swear to support the constitution, and his veto of the decree for the defence of Paris against the Austrians and Prussians, caused such irritation that on June 20, 1792, a mob marched from the suburbs to the Tuileries, took possession of the palace, seized the king, and sought by menaces and insults to make him withdraw his vetoes. He refused with great dignity and firmness, and after several hours of stoical endurance he was rescued by the arrival of the mayor with the national guard. The invasion of France by the Prussians and Austrians, and the insolent manifesto of the duke of Brunswick, their commander, again aroused the Parisians to fury; and on Aug. 10 they rose in insurrection, stormed the Tuileries, and massacred the Swiss guards, who had made a gallant defence. Louis with his family sought refuge in the hall of the national assembly, where they passed 16 hours in a narrow closet. The assembly, meantime, passed an act to suspend the royal authority, to place the king and his family under control, to give the dauphin a tutor, and to assemble a national convention. The Temple, an ancient fortress

in Paris, erected by the knights templars, was assigned as the prison for the royal family. The national convention assembled, and on Sept. 21 proclaimed France a republic. In December they brought the king to trial on various charges, the substance of which was that he had conspired with the emigrants and the foreigners to overthrow the constitution and restore the ancient order of things. These charges were supported by documents which had been found in an iron safe concealed in a wall of the Tuileries. Louis, assisted by three advocates, Tronchet, Desèze, and Malesherbes, was brought before the convention on Dec. 11 and 26, and made a dignified and forcible defence, but was found guilty by a unanimous vote, Jan. 15, 1793. After stormy debates between the Girondists and Jacobins, he was condemned on the 20th by a majority of a few votes, and guillotined on the 21st.—Among the special works on the life and reign of Louis XVI. are the histories of Droz, Falloux, and Soulavie, and De Tocqueville's *Coup d'œil sur le règne de Louis XVI.* The *Journal de Louis XVI.*, edited by Louis Nicolardôt (Paris, 1873), is a minute diary of his private life in Versailles, devoted chiefly to trivial accounts.

**LOUIS XVII.**, dauphin and titular king of France, son of the preceding, born in Versailles, March 27, 1785, died in the Temple at Paris, June 8, 1795. He was the third child of Louis and Marie Antoinette. The title he first bore was duke of Normandy, and he became dauphin by the death of his elder brother Louis Joseph, June 4, 1789. He was very carefully educated under the supervision of his father, and at the outbreak of the revolution was a beautiful, lively, and intelligent child, but remarkably impatient and unmanageable. He was imprisoned in the Temple with the rest of the royal family, Aug. 13, 1792. After the execution of his father, Jan. 21, 1793, he was proclaimed king by his uncle (afterward Louis XVIII.), and was recognized by most of the courts of Europe, by the Vendean chiefs, and by the insurgents in the south of France. These demonstrations, together with several attempts by the royalists to rescue him from prison, irritated and alarmed the revolutionary government; and on July 3, at 10 o'clock at night, the boy was torn from his mother's arms and carried screaming to another part of the prison. Here he was consigned to the care of a shoemaker named Antoine Simon, a violent Jacobin of rough manners and brutal temper, who, with his wife, treated him with systematic cruelty. The young prince was left alone in a cell day and night, without employment or amusement, or any opportunity for exercise or to breathe fresh air. A vessel of water, seldom replenished, was given him, and some coarse food was occasionally thrown in at the half opened door. He was allowed no means of washing himself, and his bed was not made for months. His limbs became rigid, and his mind, through terror, grief, and monotony, became imbecile,

and at length deranged. Something he had said in reply to questions having been perverted to the injury of his mother, he resolved thenceforth to be silent, and for a long period neither threats nor blows nor coaxings could induce him to speak. When not sleeping he sat quietly in his chair, without uttering a sound or shedding a tear, or shrinking from the rats with which his dungeon swarmed. After the reign of terror he was placed under more merciful keepers, but was still kept in solitary confinement, and not allowed to see his sister, imprisoned in an adjoining apartment. At length, in May, 1795, a physician was allowed to see him, who pronounced him dying of scrofula. According to official accounts, he died at 2 P. M. in the arms of Lasne, one of his keepers, and the next day, June 9, his body was identified and certified to by four members of the committee of public safety and by more than 20 officials of the Temple. A post-mortem examination was made the same day by four distinguished physicians. On the 10th the remains were buried in the cemetery of Ste. Marguerite, and every trace of the grave carefully obliterated.—The principal pretenders who have claimed to be Louis XVII. were the Rev. Eleazar Williams, who died in 1858 (see WILLIAMS, ELEAZAR); Hervagault, a tailor's son, who died at Bicêtre in 1812; Bruneau, another mechanic's son, who died in prison about 1818; Hébert, who called himself baron de Richemont, duke of Normandy, and after various arrests and adventures died about 1855; and Naundorff, son of a Prussian locksmith, born in 1786, died at Delft, Aug. 10, 1845. The last named published his autobiography, *Histoire des infortunes du dauphin*. His claims were pleaded in 1851 by Jules Favre before a French court, at the instance of his son and daughter; but the evidence of the death of Louis XVII. in 1795 was regarded as conclusive by the court. The case was revived in February, 1874, with the same result.—See *Intrigues dévoilées, ou Louis XVII., dernier roi légitime de France* (4 vols., Rotterdam, 1846-'8), and other writings by Gruau de la Barre; and Beauchesne, *Louis XVII., sa vie, son agonie, sa mort* (Paris, 1852; English translation by William Hazlitt, London, 1853).

**LOUIS XVIII.** (LOUIS STANISLAS XAVIER), king of France, born in Versailles, Nov. 17, 1755, died in Paris, Sept. 16, 1824. The fourth son of the dauphin of Louis XV. and of Maria Josepha of Saxony, he received at his birth the title of count of Provence, and on the accession of his brother Louis XVI., that of Monsieur. He spent much time during his brother's reign in philosophical and literary studies, and in petty intrigues against the king, the queen, and his younger brother, the future Charles X. He opposed the liberal measures of Maurepas, the reforms of Turgot, and the financial experiments of Necker, but afterward took an important part in the acts of the assembly of notables, contributed to the fall of Calonne, sided

with the parliaments, and thus gained much popularity. On the outbreak of the revolution he lived in comparative retirement, and was unobserved during the tumults of Oct. 5 and 6, 1789, but in the following year was accused of complicity in the alleged conspiracy of the marquis of Favras against the revolution. He made a public defence and was acquitted with acclamations, while Favras suffered the punishment of death without naming any of his associates. In June, 1791, Monsieur finally fled from the capital, and succeeded in escaping beyond the frontier. The court being now kept under surveillance by the people, he took up his abode in Coblenz on the Rhine, declared his brother to be a captive, and, gathering around him the so-called *France extérieure*, formed a kind of camp court, protesting against the revolutionary measures of the national assembly. He took an insignificant part in the unsuccessful Prussian invasion of France in September, 1792. Having assumed the title of regent for Louis XVII. after the execution of Louis XVI., he lived successively at various places in Germany and England, and at Verona, whence he was driven again by the victories of Bonaparte (1796). An attempt was made upon his life at Dillingen, after which he repaired to Mitau in Courland, which he soon had to leave at the command of the czar Paul. He then lived in Warsaw till the treaty of Tilsit (1807), and finally in England till the fall of Napoleon in 1814. Suffering under a complication of painful diseases, he now returned in triumph to his native country, after an absence of 23 years, to occupy the throne of his ancestors. Infirm and old, and surrounded by an ultra-royalist party desirous of revenge on their popular enemies, it soon became apparent that he possessed neither the sympathy of the people nor the fidelity of the remnants of the Napoleonic army; and scarcely had the captive of Elba appeared on the coast of southern France, when Louis saw himself deserted, and left Paris for Ghent, March 20, 1815. But the battle of Waterloo again replaced him upon his throne, and he returned to Paris, July 8. France was humiliated by the treaty of Vienna, exhausted, and utterly demoralized; the strifes of factions, ultra royalists and ultra liberals, broke out with unbridled fury, assuming in some districts the shape of bloody popular commotions, and in others that of religious fanaticism; the finances of the kingdom were in a deplorable condition, while the requisitions of the restored old victims of the revolution knew no bounds. The king granted a charter, but almost every important part was gradually altered, his anxiety to heal the wounds of the distracted state being far superior to his ability to do it. There was as little harmony at the court and among the various ministries (under the lead of Talleyrand, Richelieu, Decazes, &c.) as there was in the chamber, in which Chateaubriand and Benjamin Constant eventually became the most eminent leaders of the opposite

parties. A better order and better feeling prevailed after the congress of Aix-la-Chapelle (1818), which reinstated France in its dignity as a great power, and the evacuation of its territory by the army of occupation. Some conspiracies were easily suppressed; the assassination of the duke of Berry by Louvel (1820) remained without effect, as the duchess of Berry was soon delivered of an heir to the throne, the duke of Bordeaux; and even the intervention in 1823 of a French army under the duke of Angoulême, the king's nephew, for the restoration of Ferdinand VII. in Spain, could not entirely deprive Louis of the esteem and affection of the people.

**LOUIS I.** (LUDWIG KARL AUGUST), king of Bavaria, born Aug. 25, 1786, died in Nice, Feb. 29, 1868. He visited Italy in 1804-'5, served in the Bavarian contingent to Napoleon's armies in 1806-'9, and married the princess Theresa of Hildburghausen, Oct. 12, 1810. In 1814 he accompanied the allied sovereigns to London. He succeeded to the throne Oct. 13, 1825, after the death of his father, King Maximilian Joseph. He distinguished himself by his patronage of letters and art, removed the university of Landshut (which as well as that of Göttingen he had himself attended) to Munich, reorganized the academy of fine arts, and constructed the Odeon, Basilica, Pinakothek, Walhalla, and other public works and monuments. In the sphere of learning, he encouraged more especially historical studies, and his taste for poetry is attested by his own publications, *Gedichte* (1829) and *Walhalla's Genossen* (1843). In the early part of his administration he showed a leaning toward a popular policy; but the ultramontane party predominated in his councils from 1831 to 1847, when general hostility to its influence led to its downfall, without diminishing, however, the public excitement, which was increased by the supposed influence of Lola Montez over the mind of the king. In February, 1848, disturbances broke out in Munich, after which Lola fled, and a short time afterward the king himself went into retirement (March 20), resigning in favor of his son Maximilian, who, dying March 10, 1864, was succeeded by his son, Louis II., born Aug. 25, 1845. The second son of Louis I. was Otho, king of Greece (1832-'62).

**LOUIS IV.**, the Bavarian, emperor of Germany, born about 1285, died near Fürstenfeld, in the neighborhood of Munich, Oct. 11, 1347. He was the son of Louis the Severe, duke of Bavaria, and of Matilda, daughter of the emperor Rudolph I. of Hapsburg; and after the death of his father, having been for some years under the tutelage of his mother, he became co-regent with his elder brother Rudolph in their hereditary possessions. After the sudden death of the emperor Henry VII. of Luxemburg in Italy (1313), he was chosen as his successor in October, 1314, by the majority of the electors, while his late friend Frederick the Fair of Austria, like himself a grandson of



Rudolph of Hapsburg, and son of the emperor Albert I., was proclaimed emperor by the minority, under the name of Frederick III. A long war between the two rivals ensued, which, after the devastation of a large part of Germany, was terminated by the battle of Amping or of Mühlendorf, Sept. 28, 1322, which made Frederick the captive of Louis. His election was annulled by Pope John XXII., who in 1323 ordered him to abdicate, and on March 21, 1324, he was excommunicated. The same year he married Margaret of Holland. He was summoned to appear before the pope, July 11, but the diet of Ratisbon declared the citation null; and in 1325 he concluded a treaty with Frederick, releasing him from captivity on condition that he would return if he should prove unable to persuade his adherents to acknowledge the imperial title of the victor. Not succeeding in this object, Frederick kept his promise, and Louis not only renewed his early friendship with him, but made him governor of his hereditary possessions in Bavaria. In 1327 he declared the pope a heretic, started for Italy, and was crowned in Milan, and on Jan. 17, 1328, in Rome, by the bishops of Venice and Aleria. He deposed Pope John, and procured the election of Peter de Corbière, who took the title of Nicholas V. But this step caused a general movement against the emperor in Italy, which compelled him speedily to retire from Rome. John XXII. not only maintained himself, but he as well as his successors Benedict XII. and Clement VI. continually endangered the position of the emperor by raising up foreign enemies and rivals in Germany. Of the latter, Charles of Bohemia was in 1346 elected emperor. Louis, however, having strengthened his power in Germany by patronage bestowed on his son Louis, as well as by the inheritance of Holland, Zealand, Friesland, and other possessions through his wife Margaret of Holland, was enabled in 1347 to prepare for another expedition to Italy, when he suddenly died while hunting, of apoplexy, or, as some believed, of poison. Charles succeeded him as the fourth of that name.

**LOUIS, Pierre Charles Alexandre**, a French physician, born at Ai, department of Marne, in 1787, died in Paris in September, 1872. He received his degree of M. D. at Paris in 1813, and subsequently entered the *hôpital de la charité* in that city, where he studied diagnosis and pathological anatomy. His first works, *Recherches anatomico-pathologiques sur la phthisie* (Paris, 1825), and *Recherches sur la membrane muqueuse de l'estomac, &c.* (1826; 2d ed., 1843), procured him admission to the academy of medicine. His reputation meanwhile rapidly increased, and his position as a pathologist was one of the most eminent in Paris. In 1828 he was a member of the medical commission sent to Gibraltar to examine into the causes and cure of yellow fever, and concurred in the report on the disease published in 1832. In 1854 he retired from prac-

tice, with the reputation of one of the first physicians in his peculiar department in Europe. He is particularly distinguished for having first brought prominently into notice the importance of medical statistics as a means of acquiring information as to the characters, causes, phenomena, and particularly the mortality of disease. He declared that the impressions received by the individual practitioner from observing and recollecting isolated cases were often imperfect or deceptive; and that genuine and trustworthy knowledge could be gained in medicine only by counting a large number of similar cases, and recording accurately the proportion of those in which each particular symptom or event occurred. This was known as the numerical method, and has no doubt exerted a great and beneficial influence on modern scientific medicine. Among his remaining works are: *Recherches sur la fièvre typhoïde* (2 vols., 1828; enlarged ed., 1841); *Examen de l'Examen de Broussais* (1834); and *Recherches sur les effets de la saignée dans quelques maladies inflammatoires* (1835). He also wrote a variety of memoirs and papers on medical subjects.

**LOUISA. I.** A central county of Virginia, bounded N. by the North Anna river, and drained by the South Anna and Little rivers; area, 570 sq. m.; pop. in 1870, 16,332, of whom 10,063 were colored. The surface is hilly, and the soil somewhat exhausted. It contains gold mines, but they have not been profitable. The Chesapeake and Ohio railroad passes through it. The chief productions in 1870 were 126,353 bushels of wheat, 151,942 of Indian corn, 126,387 of oats, 930,226 lbs. of tobacco, and 75,914 of butter. There were 1,734 horses, 2,375 milch cows, 1,159 working oxen, 1,658 other cattle, 2,088 sheep, and 6,354 swine; 17 flour mills, 1 manufactory of pig iron, 4 of tobacco, and 1 distillery. Capital, Louisa Court House. **II.** A S. E. county of Iowa, bordered E. by the Mississippi, and intersected by the Iowa river; area, 542 sq. m.; pop. in 1870, 12,877. The soil is very fertile, especially on the borders of the streams. The Burlington, Cedar Rapids, and Minnesota railroad, and the Southwestern branch of the Chicago, Rock Island, and Pacific, pass through it. The chief productions in 1870 were 221,171 bushels of wheat, 931,263 of Indian corn, 169,452 of oats, 74,788 of potatoes, 51,425 lbs. of wool, 383,926 of butter, and 25,880 tons of hay. There were 7,255 horses, 5,987 milch cows, 12,601 other cattle, 12,835 sheep, and 26,478 swine; 9 manufactories of carriages, 8 of saddlery and harness, 1 of woollen goods, 2 flour mills, and 2 saw mills. Capital, Wapello.

**LOUISA** (LUISE AUGUSTE WILHELMINE AMALIE), queen of Prussia, born in Hanover, March 10, 1776, died at the palace of Hohenzeritz, near Strelitz, July 19, 1810. She was the daughter of Duke Charles of Mecklenburg-Strelitz, and was married, Dec. 24, 1793, to the crown prince of Prussia, who succeeded to the throne in 1797

as Frederick William III. During the campaign of 1806 she accompanied him to Thuringia, and after the battle of Jena to Königsberg. After the fatal battle of Friedland in 1807 she visited Napoleon at Tilsit, with a view of obtaining for Prussia favorable conditions of peace; but not succeeding in her negotiation, she joined her husband at Memel, and in 1808 returned with him to Königsberg, from whence she proceeded at the end of the year to St. Petersburg. She went to Berlin in 1809, and died the next year while on a visit to her father at Strelitz. She was greatly beloved by the Prussian people.—See "The Life and Times of Louisa, Queen of Prussia," by Elizabeth Harriet Hudson (2 vols., London, 1874).

**LOUISA ULRICA**, queen of Sweden, born in Berlin, July 24, 1720, died in Stockholm, July 16, 1782. She was a sister of Frederick the Great, and married in 1744 the crown prince and future king Adolphus Frederick of Sweden. She distinguished herself by her great intelligence and persuasive powers, by her patronage of Linnæus and of science and art, and by establishing at her own expense the academy of belles-lettres and history and the museum at Stockholm, and the library and art museum at the palace of Drottningholm. Her efforts to make the crown more independent of the nobles, and to indoctrinate her sons, Gustavus III. and Charles XIII., with her views, made her many enemies; and after the death of her husband (1771) she appeared little at court.

**LOUIS OF BADEN.** See BADEN-BADEN, LUDWIG WILHELM I., margrave of.

**LOUIS THE GREAT**, king of Hungary and Poland, born in 1326, died Sept. 14, 1382. He succeeded his father Charles Robert of Hungary in 1342. In 1347 he made an expedition to Naples to avenge on Queen Joanna the assassination of her husband and cousin Andrew, his brother. Joanna having fled to Avignon, he had himself proclaimed king of Naples, but after a second expedition made peace with her in 1350. (See JOANNA, I.) He conquered Moldavia and Bulgaria, and had previously extorted homage from the waywode of Wallachia. In 1370 he succeeded his uncle Casimir the Great on the throne of Poland, his realms then extending from the Baltic to the Black sea and the Adriatic. Of his two daughters, Mary succeeded him in Hungary, and Hedvig in Poland.

**LOUISBURG**, a ruined town of the province of Nova Scotia, Canada, on the S. E. side of the island of Cape Breton, in lat. 45° 54' N., lon. 59° 52' W. Its present population consists of only a few fishermen. After the surrender of the French settlements in Nova Scotia to England by the peace of Utrecht in 1713, emigrants from those settlements occupied the coasts of the neighboring island of Cape Breton, and Louisburg, so named in honor of Louis XIV., began to be fortified by the French government on a gigantic scale, with the intention of making it the strongest fortress in America, and a commanding naval, fishing, and com-

mercial station. The town was about 2½ m. in circumference, and stood upon a neck on the S. side of the harbor, a beautiful and extensive land-locked basin with an entrance half a mile broad. It was fortified by a wall from 30 to 36 ft. high, with a ditch 80 ft. broad. The main works mounted 65 heavy cannon and 16 mortars. On Goat island, at the entrance to the harbor, was a battery of 30 guns, and at the bottom of the harbor opposite the entrance was another called the royal battery, which mounted also 30 guns. These fortifications had been 30 years in building, and had cost \$5,000,000. The neighborhood of Louisburg caused great uneasiness in New England, whose fisheries were threatened with ruin by the privateers who found refuge in its harbor. In 1745, Great Britain being at war with France, Gov. Shirley of Massachusetts devised a plan for taking Louisburg, which was adopted by the legislature of that province in secret session by a majority of one vote. Forces were promptly raised, and William Pepperell was appointed commander. Connecticut sent 516 men, New Hampshire 304, and Massachusetts 3,250. Embarked in 100 New England vessels, and supported by a British squadron under Commodore Warren, they landed near Louisburg on April 30. The place was defended by a garrison of 1,600 men commanded by Duchambon. A detachment stationed in the royal battery on the shore of the harbor, struck with panic at the approach of the New Hampshire troops led by William Vaughan, spiked their guns and abandoned their post in the night. Vaughan took possession of it next morning, and beat off the French who attempted to recover it. Major Seth Pomroy, a gunsmith from Northampton, with 20 other smiths, succeeded in drilling out the cannon, and fire was soon opened on the city. The siege, though prosecuted with energy and vigilance, was conducted in the most irregular and unscientific manner. On May 18 a large French ship of war laden with military stores for the supply of the garrison, and with a body of troops on board, was intercepted and taken by the English fleet. Disheartened by this disaster, and alarmed by the erection of a battery on the lighthouse cliff which commanded Goat island, the French commandant capitulated on June 17, the 49th day of the siege. This achievement called forth great rejoicings in New England and in New York and Philadelphia, and its influence was felt 30 years later at the beginning of the revolutionary war. Col. Gridley, who planned Pepperell's batteries, laid out the American intrenchments at Bunker Hill; the same old drums that beat on the triumphal entrance of the New Englanders into Louisburg, June 17, 1745, beat at Bunker Hill, June 17, 1775; and when Gen. Gage was erecting breastworks on Boston neck, "the provincial troops sneeringly remarked that his mud walls were nothing compared with the

stone walls of old Louisburg." In England the news was received with bonfires and illuminations in London and other cities; and such was the impression made by the exploit, that it was considered an equivalent for all the successes of the French upon the continent, and the first lord of the admiralty declared that "if France were master of Portsmouth he would hang the man who should give Cape Breton in exchange." Nevertheless, by the peace of Aix-la-Chapelle in 1748, Louisburg was restored to France. In 1757, during the seven years' war, the earl of Loudon, British commander-in-chief in North America, collected at Halifax a force of 6,000 regulars, 4,000 provincial troops from New England, and large numbers from New York and New Jersey, with which to make an immediate attack on the fortress; but on learning that the garrison consisted of 6,000 regular soldiers, and that 17 French line-of-battle ships were moored in the harbor, he abandoned the project. A second expedition under Gen. Amherst, consisting of 14,000 men and a fleet of 20 ships of the line and 18 frigates, sailed from Halifax, May 28, 1758, against Louisburg, which was defended by the chevalier de Drucourt with 3,100 men. The harbor being secured against attack by a fleet of eight ships, and the entrance blocked by three sunken frigates, a landing was effected at the creek of Cormoran, June 8, and Gen. Wolfe, who afterward took Quebec, advanced with 2,000 men against a detached post, which was abandoned at his approach. Strong batteries were erected here, and also on the opposite side of the town, and a heavy cannonade directed against the town and the shipping in the harbor. Three of the large men-of-war were at length set on fire by bombs, and two others captured by boats. Breaches were made in the walls, and after a gallant defence the garrison surrendered, July 26, and, together with sailors and marines, amounting collectively to 5,637 men, were carried prisoners to England. The town was almost a heap of ruins. The inhabitants were transported to France in English ships, and the fortifications were demolished.

**LOUIS D'OR**, a French gold coin, first struck under Louis XIII. in 1641. It has fluctuated in value, but subsequent to 1785 was coined at the rate of 36½ to the mark of gold 22 carats fine, having an intrinsic value of about 20s. sterling (\$4 86). These ceased to be legal coins in France as early as 1726, but they still circulated in Germany and Switzerland. Upon the return of the Bourbons in 1814 coins struck by Louis XVIII. in imitation of the napoleons were called louis, or louis d'or; and this name is sometimes given to the same coin struck by Louis Philippe.

**LOUISIANA**, one of the gulf states of the American Union, and the fifth admitted under the federal constitution, situated between lat. 28° 59' and 33° N., and lon. 88° 40' and 94° 10' W.; extreme length E. and W. about 300 m., extreme width N. and S. 240; area, 41,346

sq. m. It is bounded N. by Arkansas (on the parallel of 33°) and Mississippi (on the parallel of 31°); E. by the gulf of Mexico and Mississippi, from which above lat. 31° it is separated by the Mississippi river, and below that parallel by Pearl river; S. by the gulf of



State Seal of Louisiana.

Mexico; and W. by Texas, from which through the southern two thirds of the line it is separated by the Sabine river and lake. Louisiana is divided into 57 parishes (corresponding to the counties of other states), viz.: Ascension, Assumption, Avoyelles, Bienville, Bossier, Caddo, Calcasieu, Caldwell, Cameron, Carroll, Catahoula, Claiborne, Concordia, De Soto, East Baton Rouge, East Feliciana, Franklin, Grant, Iberia, Iberville, Jackson, Jefferson, Lafayette, Lafourche, Lincoln, Livingston, Madison, Morehouse, Natchitoches, Orleans, Ouachita, Plaquemines, Pointe Coupée, Rapides, Red River, Richland, Sabine, St. Bernard, St. Charles, St. Helena, St. James, St. John the Baptist, St. Landry, St. Martin, St. Mary, St. Tammany, Tangipahoa, Tensas, Terrebonne, Union, Vermilion, Vernon, Washington, Webster, West Baton Rouge, West Feliciana, Winn. There are seven incorporated cities, viz.: New Orleans (pop. in 1870, 191,418), the capital and commercial centre of the state, on the Mississippi, about 100 m. from the sea; Baton Rouge (pop. 6,498), the former capital, on the E. bank, 129 m. above New Orleans; Shreveport (pop. 4,607), on the Red river, in the N. W. part of the state; Carrollton and Kenner, near New Orleans; Monroe, on the Washita, in the N. part of the state; and Natchitoches, on the Red river, below Shreveport. Abbeville, Alexandria, Bastrop, Brashear City, Clinton, Covington, Delhi, Donaldsonville, Franklin, Houma, Jackson, Mandeville, Mansfield, Minden, New Iberia, Opelousas, Plaquemines, St. Martinsville, Thibodaux, Vermilionville, and Washington are towns having each more than 500 inhabitants.—The population of the state in 1810 and at subsequent decennial periods was as follows:

U. S. CENSUS.	White.	Free colored.	Slaves.	Total.
1810.....	84,811	7,585	84,660	76,556
1820.....	78,388	10,476	69,064	153,407
1830.....	89,441	16,710	109,588	215,739
1840.....	158,457	25,502	168,452	352,411
1850.....	255,491	17,462	244,809	517,762
1860.....	357,456	18,647	381,726	708,003
1870.....	362,065	364,210	....	726,915

Included in the last total are 71 Chinese and 569 Indians. In aggregate population Louisiana ranks 21st among the states, the gain since 1860 being 2·67 per cent. ; in white population, 27th, gain 1·29 per cent. ; in colored population, 7th, gain 3·95 per cent. Of the total population in 1870, 665,088 were native and 61,827 foreign born ; 362,165 were males and 364,750 females. Of the natives, 501,864 were born in the state, 31,628 in Mississippi, 30,033 in Virginia and West Virginia, 20,446 in Alabama, 15,969 in Georgia, 10,838 in South Carolina, 8,320 in Kentucky, 7,283 in North Carolina, 6,864 in Tennessee, 6,486 in Maryland, 4,709 in Texas, 3,913 in New York, 3,747 in Arkansas, 2,925 in Missouri, 1,698 in Pennsylvania, 1,499 in Ohio, and 1,497 in Florida. Of persons born in the state, 63,133 were living in other states and territories. Of the foreigners, 18,933 were born in Germany, 17,068 in Ireland, 12,341 in France, 2,811 in England, 1,889 in Italy, 1,772 in Cuba and other West India islands, and 1,130 in Spain. Of the colored, 307,610 were blacks and 56,600 mulattoes. There were 159,007 citizens of the United States 21 years old and upward. The number of families was 158,099, with an average of 4·6 persons to each ; of dwellings, 150,427, with an average of 4·83 persons to each. There were 257,184 persons 10 years old and over unable to read ; 276,158 were unable to write, of whom 268,773 were natives and 7,385 foreigners, 23,888 white males and 26,361 white females, 109,463 colored males and 115,530 colored females ; 46,878 were between 10 and 15 years of age, 45,227 between 15 and 21, and 183,637 were 21 years old and over. Of the last number, 12,048 were white males and 76,612 colored males. There were 447 blind persons, 197 deaf and dumb, 451 insane, and 286 idiotic. The number of persons convicted of crimes during the year was 1,559 ; number of paupers supported, 590. There were 256,452 persons 10 years old and over (198,168 males and 58,284 females) returned as engaged in occupations, of whom 141,467 were employed in agriculture, 65,347 in professional and personal services, 23,831 in trade and transportation, and 25,807 in manufactures and mechanical and mining industries. Among the special industries represented were : agricultural laborers, 97,783 ; farmers and planters, 41,672 ; domestic servants, 26,833 ; laborers, 25,525 ; clergymen, 404 ; lawyers, 663 ; physicians and surgeons, 939 ; teachers, 1,570 ; traders and dealers, 7,797 ; clerks, salesmen, &c., 7,157 ; carmen, draymen, &c., 2,021 ; sailors, steamboatmen,

&c., 2,176 ; blacksmiths, 1,483 ; boot and shoe makers, 1,594 ; masons and stone cutters, 1,135 ; butchers, 1,110 ; carpenters and joiners, 4,578 ; coopers, 1,141 ; painters and varnishers, 1,020 ; tailors, tailoresses, and seamstresses, 2,559. Among the descendants of the French settlers in many portions of the state French is still the vernacular.—The surface of the state is generally low and level. In the S. part nearly one fourth of it lies but 10 ft. above the sea, and is liable to frequent inundations from freshets in the rivers. Much of the delta of the Mississippi is occupied by swamps, and the coast is lined with extensive salt marshes. N. of these, on the W. of the Mississippi, are vast level prairies, having but little greater elevation. The W. margin of that river is also low, intersected by numerous streams, and liable to inundation. N. and W. of these two tracts is a region occupying about half of the state, somewhat broken and diversified by low hilly ranges, nowhere rising above 200 ft. The E. corner of the state, lying between the Mississippi and Pearl rivers and Lake Pontchartrain and the state of Mississippi, resembles the region last described in its general features. In ascending the Mississippi, the E. bank first rises to form a natural barrier a few feet above the highest level of the river, at Baton Rouge ; at Port Hudson, 25 m. further up, the bluffs are nearly 100 ft. high ; and at Natchez they attain a height of 200 ft. Below Baton Rouge on both banks, and on the W. bank throughout the state, the country requires to be protected by levees. More than 1,500 m. of these have been built on the Mississippi, the Red, the Lafourche, the Atchafalaya, the Black, and the Washita rivers, and on numerous important bayous, at great cost. Occasionally they burst, and great damage is caused by the overflow. One of the most extensive inundations ever known was occasioned by crevasses in the levees in the spring of 1874, when in Louisiana alone 31 parishes were wholly or partially overflowed. The damage to crops and property was very great, and thousands of the inhabitants were preserved from starvation only by the bounty of the government and the contributions of the benevolent.—Louisiana has a coast line of 1,256 m. on the gulf of Mexico. This includes the many irregular bays and other indentations, but not the islands belonging to the state, which have an aggregate coast line of 994 m. Toward the S. E. extremity lies Lake Borgne, which is properly a bay, communicating by two channels with Lake Pontchartrain, and opening into Mississippi sound. S. of Lake Borgne, and separated from it by the peninsula of St. Bernard parish, is Isle au Breton sound. Swan bay, Black bay, and Oyster bay are inlets of this sound. Bay Ronde and West bay lie on either hand of the delta of the Mississippi ; and on the S. coast are Baratarya, Timbalier, Terrebonne, Caillou, Atchafalaya, Côte-Blanche, and Vermilion bays. Although the entire coast except in the S. W. part is exceedingly irreg-

ular, there are not many good harbors. The Chandeleur islands, which lie opposite St. Bernard parish, S. of Mississippi sound, and E. of Isle au Breton sound, form a good roadstead. Besides numerous ponds and lagoons among the salt marshes which line the S. shores, there are some considerable lakes, most of which are expansions of the rivers. Of these, the principal are Caddo, Soda, Cross, Bodeau, Bistineau, Wallace's, Canisnia, Bayou Pierre, Spanish, and Black, in the northwest; Jatt and Catahoula, S. E. of these; Calcasieu, Mermentau, Chetimaches (or Grand), and Verret, in the south; and Des Allemands, Washa, Maurepas, and Pontchartrain, in the southeast. The last two are expansions of the Amite river.—The state is abundantly supplied with large rivers. The Mississippi, navigable far beyond its limits, forms the N. half of the E. boundary, and then entering the state crosses it in a S. E. direction to the gulf of Mexico, its mouth forming a delta. About 800 m. of its course belong wholly or in part to Louisiana. It begins to send off branches to the gulf on the west near the point where it enters the state; the Atchafalaya river is the first, and the entire region between it and the main stream may be said to belong to the delta. Among other deltoid streams are Grand river and Bayou de Large, connected with the Atchafalaya, Bayou Terrebonne, and Bayou Lafourche. These are mostly navigable throughout at high water. Bayou Teche, navigable at high water, empties into the Atchafalaya from the west, and by means of Bayou Bœuf is connected with Red river above Alexandria. E. of the Mississippi the principal streams are the Amite (navigable by small steamers for 60 m.) and the Tickfaw, which flow from Mississippi into Lake Maurepas; the Tangipahoa and the Chifuntee, which discharge into Lake Pontchartrain; and the Bogue Chitto, which falls into the Pearl. The navigation of the Pearl is obstructed by sand bars and drift wood, but small boats ascend into Mississippi. In the S. W. part of the state are the Mermentau and Calcasieu rivers, which rise by numerous branches in the prairie region S. W. of Red river, and after expanding into the lakes of the same names discharge into the gulf of Mexico. The Sabine receives numerous small tributaries from the east, and is navigable at high water in portions of its course by small boats. The Red river enters from Arkansas in the northwest, and joins the Mississippi near the outflowing of the Atchafalaya. The navigation of the Red river is somewhat obstructed at the mouth, but steamers ascend at all seasons to the falls at Alexandria, and during eight months of the year to Shreveport, above which the "great raft" has hitherto been a bar. This obstruction was removed by the United States government in 1873, but the effect of the removal upon navigation remains to be determined. The chief tributaries, which enter from the north, are the bayou Dauchite, which expands into

Lake Bistineau; Black lake and Saline bayous, which unite before entering the Red river; Little river, which enters Catahoula lake; and Black river, formed by the confluence of the Washita and Tensas. Most of these are navigable by steamers, and the Washita, which rises in Arkansas, is navigable beyond the limits of the state.—Louisiana presents many features of geological interest. The only formations are the cretaceous, tertiary, and post-tertiary. The first underlies the whole state, but crops out only in the limestone hills of St. Landry and Winn parishes. It comes very near the surface at the salt wells in Bienville, Natchitoches, and Winn, and is the formation to which the sulphur of Calcasieu parish and the rock salt of Petit Anse belong. The tertiary presents the divisions which in Mississippi have been called the Jackson, Vicksburg, and Grand Gulf groups. The Jackson group occupies the N. W. portion of the state, except immediately along the Red river and one or two of its tributaries, as far E. as the Washita, and occurs in two isolated localities on the Arkansas border just E. of that stream. It consists of marine strata with the characteristic fossils, of lignitic beds, and of non-fossiliferous beds of laminated sands and clays. Gypsum, limestone, and iron ore occur. The Vicksburg group occupies a belt not more than 12 m. wide, S. of the Jackson, and running S. W. from the Washita river to the Sabine. It consists of smooth clays and clayey sands, full of marine fossils. Lignite and estuary beds occur in some localities, yellow and white limestone nodules are common, and iron ochre abounds. S. and S. W. of the Vicksburg is the Grand Gulf group, stretching in a widening belt from the Washita to the Texas border; it also occupies the N. portion of the region E. of the Mississippi. This group consists of massive clays, clay rocks, and sandstones generally of poor quality, with no organic remains except those of plants. The post-tertiary also, as in Mississippi, comprises the drift, the bluff, and the alluvial formations. The deposits of the drift period cover the formations already described, except parts of the Vicksburg group, and consist of various alternations of red and yellow sands and clays, with pebbles, generally flinty, but often of iron ore. The bluff formation, besides some isolated localities, occupies a considerable area in Franklin, Richland, and Carroll parishes in the northeast, as well as the region W. of Opelousas, lying S. of the Grand Gulf group and N. of the marshes. It also forms a belt just N. of Lakes Pontchartrain and Maurepas, stretching from near Pearl river to the Mississippi, thence up that river to the state line, enclosing the Grand Gulf group on the north and east. It consists chiefly of blue clays and fine sands, often containing shells of recent species, or of very fine grained, hard-pan clays of light buff or grayish color, varied in a few localities by a fine silt, sometimes calcareous, with snail shells.



This formation is overlaid by yellow loam, consisting generally of a single layer of clayey silt, which also overlies much of the drift. The fossils are partly marine and partly terrestrial. The alluvium occupies the portion of the state not covered by the other formations, embracing the sea marshes, the delta of the Mississippi, and a strip N. of the delta along the W. bank, generally from 30 to 50 m. wide, with a narrow belt on either bank of Red river. The mineral productions of the state are of minor importance. At Petit Anse, in Iberia parish, there is a mass of pure rock salt, more than 144 acres in area and of unknown depth, which is successfully mined; and in Calcasieu parish are extensive deposits of sulphur and gypsum. The salt wells in Bienville, Natchitoches, and Winn parishes were worked during the civil war.—The climate in winter, owing to north winds, is more severe than in corresponding latitudes on the Atlantic coast. The summers are long and hot, and mephitic exhalations from the marshes in autumn generate malarial fevers. The mean temperature for the year ending Sept. 30, 1873, at New Orleans (lat. 29° 57'), was 67·55°; at Shreveport (lat. 32° 30'), 68·91°. The mean temperature of the warmest month at the former place was 82·4°; at the latter, 81·7°; of the coldest month, 49·5° and 42° respectively. The total rainfall for the year at New Orleans was 72·81 inches; at Shreveport, 46·77 inches. According to the census of 1870, the number of deaths in the state was 14,499, of which 5,498 were from general diseases, 1,949 from diseases of the nervous, 481 of the circulatory, 1,876 of the respiratory, and 2,128 of the digestive system, 667 from accidents and injuries, and the rest from miscellaneous causes. Of special diseases, consumption proved fatal in 1,991 cases, fevers in 1,128, pneumonia in 495, paralysis in 248, cancers in 186, cholera infantum in 179, encephalitis in 151, enteritis in 116, dropsy in 114, diarrhoea in 103, and apoplexy in 99.—The soil of the river bottoms is exuberantly fertile, and the alluvial land is easily drained. Most of it is heavily timbered, and covered with an undergrowth of cane. The prairies are not generally productive, and in some places are barren, but afford good grazing. The hilly region, while generally producing good crops of cotton, consists principally of pine barrens, yielding an abundance of pitch pine, and containing also oak, elm, cypress, honey locust, and other timber. Other forest trees are the sassafras, ash, walnut, hickory, poplar, mulberry, magnolia, cottonwood, buckeye, papaw, maple, willow, hackberry, pecan, dogwood, and persimmon. The wild cane grows to a height of 15 to 30 ft. Among fruits are the peach, quince, plum, fig, apple (in the north), orange, lemon, lime, &c.; the orange does not flourish above lat. 30°. The staples of agriculture are cotton, sugar, rice, and Indian corn. The rice and sugar are grown almost exclusively in the alluvial soil

along the Mississippi, more than half of the rice crop of 1870 having been produced in the parish of Plaquemines. The sugar cane does not flourish above lat. 31°. Louisiana produces nearly all the sugar made in the United States, and in 1870 was third among the states in the yield of rice and fourth in the production of cotton. Sugar culture was introduced in 1751, but there are no reports of production till 1823. In 1823, 88,000 hhd. were manufactured; from that year to 1838 the crops varied from 30,000 to 100,000 hhd., thence to 1848 from 87,000 to 240,000 hhd., and in the 10 years ending with 1858 from 74,000 to 449,000 hhd. The production since 1860 has been as follows:

YEAR.	Hhds.	YEAR.	Hhds.	YEAR.	Hhds.
1860.....	228,753	1865.....	18,070	1870....	144,881
1861.....	459,410	1866.....	41,000	1871....	128,461
1862.....	.....	1867.....	37,647	1872....	108,520
1863.....	76,801	1868.....	84,256	1873....	89,498
1864.....	10,857	1869*....	67,090		

The yield is very uncertain; it formerly, says Champomier, reached as high as 3,000 or 4,000 lbs., and in some cases even 6,000 lbs. to the acre; but more recently it has often ranged as low as 500 to 1,000 lbs. The number of acres of improved farm land in 1870 was 2,045,640; number of farms, 28,481, of which 11,194 were under 20 acres, 8,854 from 20 to 50, 3,888 from 50 to 100, 3,753 from 100 to 500, 650 from 500 to 1,000, and 142 over 1,000 acres; cash value of farms, \$68,215,421; of farming implements and machinery, \$7,159,333; wages paid during the year, including value of board, \$11,042,789; estimated value of all farm productions, including betterments and additions to stock, \$52,006,622; value of orchard products, \$142,129; of produce of market gardens, \$176,969; of forest products, \$92,596; of home manufactures, \$64,416; of animals slaughtered or sold for slaughter, \$817,831; of live stock, \$15,929,188. The productions were 9,906 bushels of wheat, 984 of rye, 7,596,628 of Indian corn, 17,782 of oats, 1,226 of barley, 260 of buckwheat, 26,888 of peas and beans, 67,695 of Irish potatoes, 1,023,706 of sweet potatoes, 15,854,012 lbs. of rice, 15,541 of tobacco, 140,428 of wool, 322,405 of butter, 11,747 of cheese, 2,363 of wax, 37,646 of honey, 350,832 bales of cotton, 578 gallons of wine, 833,928 of milk sold, 4,585,150 of cane molasses, 180 of sorghum molasses, 8,776 tons of hay, and 80,706 hogsheads of cane sugar. The live stock consisted of 59,738 horses, 61,338 mules and asses, 102,076 milch cows, 32,596 working oxen, 200,589 other cattle, 118,602 sheep, and 338,326 swine. There were besides 3,559 horses and 52,832 cattle not on farms.—The number of manufacturing establishments was 2,557, having 887 steam engines of 24,924 horse power, and 23 water wheels of

\* Corresponding nearly with the census year of 1870.

142 horse power; number of hands employed, 30,071, of whom 23,637 were males above 16, 4,210 females above 15, and 2,224 youth; capital invested, \$18,313,974; wages paid, \$4,593,470; value of materials, \$12,412,023; of products, \$24,161,905. The most important establishments, with the value of products, were: 204 of boots and shoes, \$459,721; 98 of bread and bakery products, \$875,261; 22 of bricks, \$264,300; 45 of carriages and wagons, \$200,280; 5 of cars, \$368,730; 114 of clothing, \$424,173; 89 of cooperage, \$255,395; 4 of cotton goods, \$251,550; 9 of drugs and chemicals, \$248,125; 1 of fertilizers, \$140,400; 248 of flouring and grist mill products, \$726,287; 3 of gas, \$862,172; 2 of ice, \$250,000; 15 of iron castings, \$552,470; 2 of distilled liquors, \$100,960; 12 of malt liquors, \$250,920; 8 of planed lumber, \$431,000; 152 of sawed lumber, \$1,212,037; 20 of machinery, \$896,518; 636 of molasses and sugar, \$10,341,858; 3 of refined molasses and sugar, \$643,085; 6 of cotton-seed oil, \$324,700; 48 of tobacco and cigars, \$578,890; and 14 ship building and repairing establishments, \$326,230.—Louisiana contains two customs districts, New Orleans and Teche (port of entry, Brashear City, formerly Franklin), and its commerce, carried on chiefly through New Orleans, is extensive and important. The value of imports from foreign countries for the year ending June 30, 1873, was \$19,933,344; of exports to foreign ports, \$104,926,000, of which \$104,357,233 (\$27,268 from Teche) represented domestic produce, and \$568,767 foreign produce. The chief items of export were 1,147,376 bales of cotton, valued at \$98,151,682; 24,065,296 lbs. of tobacco, \$2,569,558; 960,324 bushels of Indian corn, \$563,323; 36,327,583 lbs. of oil cake, \$438,667; 55,738 barrels of flour, \$407,453; hides and skins to the value of \$353,438; 3,110,766 lbs. of lard, \$257,337; 343,687 gallons of cotton-seed oil, \$175,231. The entrances were 234 American vessels of 142,835 tons (Teche, 2 of 1,166 tons), and 507 foreign vessels of 381,122 tons; clearances, 267 American vessels of 192,599 tons (Teche, 1 of 1,187 tons), and 512 foreign vessels of 383,465 tons. The entrances and clearances in the coastwise trade, with the number, &c., of vessels belonging to each district, are shown in the following table:

DISTRICTS.	Entrances.		Clearances.		Registered, enrolled, and licensed.	
	Vessels.	Tons.	Vessels.	Tons.	Vessels.	Tons.
New Orleans.	472	800,879	583	800,104	594	97,122
Teche .....	41	43,124	41	87,907	67	4,965
State .....	513	844,003	574	838,011	661	102,087

Of the entrances, 305, of 271,766 tons, were steamers, and of the clearances, 343, of 288,787 tons; 213 of those registered, &c., with

an aggregate tonnage of 63,974, were steamers, 437, of 36,934 tons, sailing vessels, and 11, of 1,179 tons, barges; 158 steamers, of 40,841 tons, and 7 barges, of 841 tons, were engaged in the river trade, the rest in ocean or coast navigation. There were 19 sailing vessels, of 246 tons, and 5 steamers, of 560 tons, built during the year.—The number of miles of railroad in the state in 1841 was 40; in 1851, 80; in 1861, 335. The mileage in operation in 1874, the names of the lines, and the termini of the completed portions are shown in the following table:

LINES.	Termini.	Miles in operation in the state.
Baton Rouge, Grosse Tête, and Opelousas.	West Baton Rouge to Lombard, Pointe Coupée parish.	23
Clinton and Port Hudson Morgan's Louisiana and Texas .....	Port Hudson to Clinton ... New Orleans to Brashear City .....	21½
Branches of above .....	Main line to Raceland ... Terrebonne to Houma .....	2½
New Orleans, Jackson, and Great Northern.	New Orleans to Canton, Miss. (206 m.) .....	88
New Orleans, Mobile, and Texas .....	Mobile <i>via</i> New Orleans to Donaldsonville (200 m.) ..	98
North Louisiana and Texas .....	Delta (opposite Vicksburg, Miss.) to Monroe .....	72
Pontchartrain .....	New Orleans to Lakeport, on Lake Pontchartrain.	6
Texas and Pacific .....	Shreveport to Dallas, Texas (186 m.) .....	20
West Feliciana .....	Bayou Sara to Woodville, Miss. (27 m.) .....	19½
Total .....		445½

The entire route of the New Orleans, Mobile, and Texas railroad, as contemplated in the charter, extends to Houston, Texas, with branches from Vermilionville to Brashear City and Shreveport; the ultimate terminus of the North Louisiana and Texas line is Shreveport, making the entire length 170 m.; while the Texas and Pacific railroad is intended to extend to San Diego, Cal. There are several short canals in the vicinity of New Orleans, connecting the navigable waters of the rivers and lakes.—On Nov. 1, 1873, there were 8 national banks, with an aggregate capital of \$4,150,000; and on Jan. 1, 1874, 2 chartered and 4 free banks working under state law, with an aggregate capital of \$4,092,300. These were all situated in New Orleans, in which city there are also a number of savings banks and insurance companies.—The government is administered under the constitution of 1868, which declares that all persons born or naturalized in the United States and subject to the jurisdiction thereof, who have resided in the state one year, are citizens of the state, and shall enjoy the same civil, political, and public rights and privileges, and be subject to the same pains and penalties; that citizens owe paramount allegiance to the United States; that the ordinance of secession is null and void; and that neither slavery nor involuntary

servitude, except as a punishment for crime, shall exist. It fixes the seat of government at New Orleans. The executive power is vested in a governor, lieutenant governor (*ex officio* president of the senate), secretary of state, treasurer, auditor, attorney general, and superintendent of public education, elected by the people for a term of four years. The governor and lieutenant governor must be citizens of the United States, and residents of the state for the two years next preceding their election. The governor is commander-in-chief of the militia, grants reprieves and pardons, and has a veto upon the acts of the legislature, which may be overcome by a two-thirds vote of both houses. He enters upon his office on the second Monday of January after his election. In case of the death, resignation, or inability to serve of the governor, the lieutenant governor performs the duties of the office. The salary of the governor is \$8,000; of the treasurer, auditor, attorney general, and superintendent of education, \$5,000 each; and of the lieutenant governor and secretary of state, \$3,000 each. The legislative power is vested in a general assembly, consisting of a senate and house of representatives. The senators, 36 in number, are elected for four years, one half retiring biennially; the representatives, numbering not more than 120 nor less than 90 (present number, 107), hold office for two years. For senatorial purposes the state is divided into districts (at present 24) of as nearly equal population as possible, no parish being divided except Orleans, from each of which not more than two senators are chosen. The representatives are apportioned among the parishes and 12 representative districts of Orleans according to population, each parish having at least one. After the state census of 1875 and every ten years thereafter a new apportionment is to be made. Every qualified elector of the district may be a representative, and if 25 years of age a senator. The legislature meets annually on the first Monday of January, unless a different day is appointed by law, but no session can continue longer than 60 days. Members receive \$8 a day during attendance, and while going to and returning from the seat of government. The house of representatives has the power of impeachment; the senate constitutes the court for the trial, a two-thirds vote being necessary for conviction. The judicial power is vested in a supreme court, district courts, parish courts, and justices of the peace. The supreme court has appellate jurisdiction only, and consists of a chief justice (salary \$10,000) and four associates (salary \$9,500) appointed by the governor with the advice and consent of the senate for eight years. They must be citizens of the United States, and must have practised law for five years, and the last three years before their appointment in this state. The state is to be divided every four years into not less than 12 nor more than 20 judicial districts (present

number, 13), in each of which, except the parish of Orleans, which constitutes the first district, there is to be one district court, presided over by a single judge, having general jurisdiction in criminal cases, original jurisdiction in civil cases in which the amount in dispute exceeds \$500 exclusive of interest, and appellate jurisdiction in civil suits from the parish courts where the amount in dispute exceeds \$100 exclusive of interest. The district judges (salary \$5,000) are elected by the people of the respective districts for a term of four years, and must be citizens of the United States, over 25 years of age, residents of the state, and have practised law therein for two years next preceding their election. In the parish of Orleans there are seven district courts; the first has criminal jurisdiction in all except capital cases, the second exclusive jurisdiction in probate matters, the third exclusive jurisdiction of appeals from judgments of justices of the peace in general cases; the superior district court has exclusive jurisdiction to issue writs of injunction, mandamus, and quo warranto, and of all proceedings in which the right to any public office is in dispute, and exclusive original jurisdiction in proceedings in which the state, the city of New Orleans, the board of metropolitan police, the board of school directors of New Orleans, or any corporation domiciled in that city, is interested, when the amount in dispute exceeds \$100, besides appellate jurisdiction of judgments of justices of the peace in such cases; the other three have exclusive jurisdiction in general civil cases, not probate, when the sum in dispute exceeds \$100 exclusive of interest. A superior criminal court has recently been created, with exclusive jurisdiction in cases of murder, treason, &c., in the parish of Orleans. In each parish a judge of the parish court is elected by the people for two years; these courts have jurisdiction in cases of misdemeanor when the accused waives a jury, of the probate of wills, &c.; original jurisdiction in other civil cases in which the amount in dispute is more than \$25 and less than \$500 exclusive of interest; and appellate jurisdiction of judgments of justices of the peace when the amount in dispute exceeds \$10 exclusive of interest. In the parish courts there is no jury. Judges may be removed from office upon impeachment, or by the governor upon the address of two thirds of both houses of the legislature. Justices of the peace are elected by the people of the various parishes for two years, and have jurisdiction in civil cases when the amount in dispute does not exceed \$100 exclusive of interest, and such criminal jurisdiction as may be conferred by law. All male citizens of the United States, except convicts, 21 years of age, who have resided in the state one year and in the parish ten days next preceding the election, are entitled to vote in the parish where they reside and at the precinct where they are registered. General elections are held on the

Tuesday after the first Monday of November, and the vote is by ballot. No one convicted of a heinous crime nor any defaulter in public funds can hold office, but no property qualification for office can be required. All officers, besides swearing to support the constitution and laws of the United States and of the state, and to discharge their duties faithfully, are required to make oath that they accept the civil and political equality of all men, and agree not to attempt to deprive any person or persons, on account of race, color, or previous condition, of any political or civil right, privilege, or immunity enjoyed by any other class of men. The militia consists of all able-bodied males between the ages of 18 and 45. The legislature is required to levy a poll tax of not exceeding \$1 50 on every male inhabitant over 21 years of age, for school and charitable purposes. Amendments to the constitution must be proposed by two thirds of each house of the legislature, and subsequently ratified by the people. The present constitution fixes the seat of government at New Orleans, whence it cannot be removed without a two-thirds vote of both houses of the legislature. In Louisiana, unlike the other states, the civil and not the common law prevails. The code, of which the last revision was made in 1870, is based upon the Spanish law, which prevailed at the time of the cession to the United States, and upon the *Code Napoléon*. The separate property of a married woman cannot be sold by her husband, and she may administer it herself. All property acquired during marriage, the earnings of the joint or separate labor of husband and wife, and the revenues of the separate property of each, enter into community, and are equally divided between them. The principal grounds of divorce are adultery, condemnation to infamous punishment, habitual intemperance, cruel treatment, abandonment, and any misconduct that renders living together insupportable. Treason, murder, rape, and arson committed in the night upon a dwelling are punishable with death. Other punishments are fines and imprisonment for various terms. The rate of interest in the absence of stipulation is 5 per cent., but as high as 8 per cent. may be collected by special agreement. Louisiana is entitled to six representatives, and in common with the other states to two senators in congress, and has eight votes in the electoral college.—The valuation of property as reported in the United States census was as follows:

YEARS.	ASSESSED VALUE.			True value of real and personal.
	Real estate.	Personal.	Total.	
1850...				\$238,993,764
1860...	\$280,704,988	\$155,082,277	\$435,787,265	602,118,568
1870...	191,843,376	62,028,514	253,871,890	323,125,666

The diminution in value in the last decade is largely due to the emancipation of the slaves. The taxation not national in 1870 amounted

to \$7,060,722, of which \$2,671,693 was state tax, \$4,109,999 parish, and \$279,030 town, city, &c. The public debt was \$53,087,441, of which \$25,021,734 (\$22,560,233 bonded) was state debt, \$1,326,635 (\$847,526 bonded) parish, and \$26,739,072 (\$18,123,010 bonded) town, city, &c. The funded state debt includes bonds to the amount of \$993,500 held by the educational funds, \$198,000 by the redemption fund, \$1,992,000 issued in payment of state subscription to railroad stock, \$1,146,000 issued in aid of railroads and canals, and \$4,838,933 lent to banks. The unfunded state debt includes \$200,000 due the educational fund. The resources of the redemption fund amounted to \$231,000. The taxable value of property in 1872 was \$228,666,653 62, viz.: real estate, \$180,108,225 83; live stock, \$11,394,056; carriages and vehicles, \$1,750,760; shares in vessels, \$3,232,864; money lent or in possession, \$1,871,463 60; capital invested in trade and commerce, \$27,924,414 20; capital stock of banks and other corporations not exempt from taxation, \$1,305,274 99; household goods and tools beyond the exemption, \$1,077,595. The valuation in 1873 was \$224,238,519 06, of which \$146,731,402 was the valuation of the city of New Orleans. The rate of taxation was \$2 15 on \$100, viz.: \$1 15 for interest, \$0 20 for schools, \$0 40 for the general fund, and \$0 40 for the construction and repair of levees. The receipts, according to the report of the auditor, for the year ending Dec. 31, 1873, were \$4,016,690 04, of which \$3,246,959 77 were from taxes on property and polls, \$47,876 55 from the tax on the Louisiana state lottery company, &c., \$37,615 91 from the redemption of lands forfeited for taxes, \$451,802 80 from licenses on trades, occupations, and professions, and the duty on auction sales, \$202,884 56 from profits in the purchase of general fund warrants, \$7,000 from the lease of the state penitentiary, and the rest miscellaneous. The expenditures during the same period were \$3,696,912 92, of which \$1,020,995 53 were for reduction of and interest on the debt, \$314,450 81 for compensation and contingent expenses of the general assembly, \$94,987 75 for outstanding legislative vouchers or warrants, \$283,710 72 for salaries of judges, \$193,037 55 for salaries of other public officers and employees, \$49,435 39 for contingent expenses of the several state departments, \$13,616 66 for rent of public offices, \$549,200 for construction and repair of levees, \$50,000 for the support of the insane asylum, \$37,500 of the deaf and dumb asylum, \$18,750 of the blind asylum, \$120,000 for the support and \$15,000 for the repair of the charity hospital, \$28,050 on account of the state university, \$151,540 50 to the state printer, \$100,000 for arming, equipping, and maintaining the militia, \$294,582 71 for the support of free public schools, and the rest miscellaneous. The actual bonded debt of the state, Jan. 1, 1874, was \$22,308,800 (including

\$529,000 bonds belonging to the free school fund and \$136,000 to the seminary fund), upon which the accruing annual interest was \$1,535,328. Of this amount \$7,960,000 was issued to defray the expense of building levees, \$4,492,000 in payment of stock of railroad companies, \$3,629,000 in aid of railroad and navigation companies, the rest for various purposes; \$10,082,800 was issued before the adoption of the present constitution, and \$12,226,000 subsequent thereto. The actual unfunded debt amounted to \$2,074,380 36. The contingent funded debt was \$4,803,683 33, consisting of bonds to the amount of \$4,297,338 33 lent to the Citizens' bank, and \$506,350 lent to the Consolidated bank, for which it is believed the state is fully secured. The contingent unfunded debt was \$679,919 14, consisting of \$479,919 14 due the general government under the deposit act, and \$200,000 due the free school accumulating fund. Besides these sums the state, under existing acts, was liable to be called upon to issue bonds to the amount of \$21,090,500, chiefly in aid of railroads. Of this amount \$8,087,500 was under acts passed subsequently to the adoption of the amendment to the constitution in November, 1870, which declares "that prior to the first day of January, 1890, the debt of the state shall not be so increased as to exceed \$25,000,000." The act of Jan. 24, 1874, known as the "funding act," authorizes the issue of "consolidated bonds," bearing interest at the rate of 7 per cent. per annum, and payable 40 years from Jan. 1, 1874, to the amount of \$15,000,000 if necessary, which are to be exchanged for all valid outstanding bonds of the state and all valid warrants drawn previous to the passage of the act, at the rate of 60 cents in consolidated bonds for \$1 in outstanding bonds and warrants. A tax of 5½ mills on the dollar is levied annually for the purpose of paying the interest and principal of the consolidated bonds, and is declared by the act to be a continuing appropriation till the bonds are redeemed. The act also declares that the entire tax for state purposes, except the support of public schools, shall never exceed 12½ mills on the dollar, and that prior to 1914 the state debt shall not be directly nor indirectly increased beyond the sum of \$15,000,000, and repeals and annuls all grants of state aid previously made that have lapsed or been forfeited.—The state institutions are the penitentiary at Baton Rouge, the insane asylum at Jackson, the charity hospital at New Orleans, and the institutions for the education of the deaf and dumb and of the blind at Baton Rouge. The convicts at the penitentiary are leased to a corporation, and are chiefly employed in the building and repairing of levees, the state deriving a small revenue from the lease. The number on May 9, 1874, was 410, of whom 395 were males and 15 females, 83 whites and 327 colored. The number of inmates of the insane asylum during 1873 was

186 (87 males and 99 females); remaining at the close of the year, 165, of whom 76 were males and 89 females, 130 whites and 35 colored. The asylum buildings are inadequate, and not well adapted to its needs. The charity hospital was founded by a Spanish resident of New Orleans in 1786. The present building, which has capacity for 630 beds, was erected in 1832 by the aid of a grant from the state and a gift from the state of Pennsylvania, with the assistance of benevolent individuals. The hospital is open to all applicants. The number of patients treated during 1873 was 5,660; remaining at the close of the year, 543. The institution for the deaf and dumb has a printing office and bookbindery connected with it for the instruction of the pupils, by whom a bi-weekly paper is published. The number in attendance during 1873 was 54 (34 males and 20 females). The institution for the blind was separately organized in 1871, having previously been connected with that for the deaf and dumb, and occupies leased buildings. It has an industrial home connected with it, which is intended to provide the blind with board and lodging, and to supply them with work by means of which they may support themselves. The number of pupils in attendance during 1873 was 26 (17 males and 9 females); remaining at the close of the year, 21.—The constitution requires the legislature to establish in each parish at least one free public school, and to provide for its support by taxation or otherwise, and prescribes that all children from 6 to 21 years of age shall be admitted to the public schools and other institutions of learning sustained or established by the state, without distinction of color. The public schools are governed by the provisions of the act of March 16, 1870, and subsequent amendments. The state is divided into six divisions, the parish of Orleans forming the sixth. For each division a superintendent of public education is appointed by the governor, with the consent of the senate, for three years. The division superintendents, with the state superintendent of public education, constitute the state board of education, which chooses a secretary, and appoints for two years a board of school directors, who serve gratuitously, for each incorporated city and town of from three to five members; and for each parish except Jefferson and Orleans of five members. Jefferson has a board of directors for that portion on each bank of the Mississippi, and the board of directors for the parish of Orleans and city of New Orleans consists of 20 members, one from each representative and one from each municipal district, together with the city administrator of finance and the superintendent of public education for the sixth division *ex officio*. The school fund consists of the proceeds of lands granted by the United States for the support of public schools and of escheated estates, with any property that may be bequeathed for school



purposes. The interest upon this fund at 6 per cent. per annum, the rents of any unsold lands, and the interest of the United States trust fund deposited with the state under the act of congress of June 23, 1836, are appropriated for the support of public schools. According to the report of the state superintendent for the year ending Dec. 31, 1873, there were 272,334 persons in the state of school age; number of school districts, 483; of public schools, 864; teachers, 1,296 (685 males and 611 females); pupils enrolled, 59,030; average salary of teachers per month, \$42 50; average number of months each school was taught, 4½; estimated value of school property, \$661,962; number of school houses built during the year, 101. So far as the grade was reported, there were 3 high schools, 1 high grammar, 81 grammar, 124 intermediate, and 331 primary; of the pupils, so far as distinction of sex was given, 28,371 were males and 27,089 females. The average daily attendance in 34 parishes was 35,061. No public schools were reported in seven parishes, and in six of these neither public nor private schools were returned. The whole number of private schools reported was 296, with 794 teachers and 21,434 pupils. The receipts for the support of public schools, including \$91,917 19 on hand at the beginning of the year, were \$678,473 52, of which \$254,249 50 were from

state apportionments, \$204,995 94 from corporate authorities, \$44,883 78 from sale of school lands, \$34,600 from appropriation for salaries of officers and office expenses, and \$47,727 11 from other sources. The disbursements, of which \$144,323 74 were paid in school certificates, were \$723,826, of which \$551,460 92 were for teachers' wages, \$42,966 62 for rent of school houses, \$13,419 88 for repairs of school houses, \$13,966 35 for purchase of school furniture, \$4,038 07 for school-house sites, \$14,995 39 for building school houses, \$30,632 04 for fuel and incidentals, \$802 40 for school apparatus, \$16,944 33 for previous indebtedness, \$34,600 for salaries and contingent expenses of superintendents and other officers; balance on hand at the close of the year, \$98,971 26. The number of schools of all classes in 1870, according to the United States census, was 592, with 926 male and 976 female teachers, 29,854 male and 30,317 female pupils, and an annual income of \$1,199,684. This number includes 178 public schools, 36 classical (8 colleges and 28 academies), 4 professional (1 law, 2 medical, and 1 theological), 8 technical (4 commercial, 1 for the blind, 1 for the deaf and dumb, and 2 of art and music), 293 day and boarding, and 73 parochial and charity. The following table exhibits the statistics of the principal colleges of the state for 1872-'3:

NAME.	Location.	Date of organization.	Denomination.	Number of instructors.	Students.	Volumes in libraries.
Centenary.....	Jackson.....	1825	Methodist Episcopal, South	5	124	5,200
St. Charles.....	Grand Coteau.....	1832	Roman Catholic.....	18	82	4,000
Louisiana state university.....	Baton Rouge.....	1860	None.....	13	140	11,611
St. Mary Jefferson.....	St. James.....	1861	Roman Catholic.....	14	112	.....
Straight university.....	New Orleans.....	1869	Evangelical.....	15	429	1,500
New Orleans university *.....	New Orleans.....	1873	Methodist Episcopal.....	7	823	1,000

The Louisiana state university was established by act of the legislature in 1855, on grants of land made by the United States at various times between 1806 and 1827 for the establishment of "a seminary of learning." It was opened at Alexandria for the reception of cadets in January, 1860, under the superintendence of Col. (now Gen.) W. T. Sherman, but its operations were interrupted during the civil war. It was reopened in October, 1865. On Oct. 15, 1869, the building was burned, and in the following November the institution was removed to temporary quarters in the asylum for the deaf and dumb at Baton Rouge. The university embraces a preparatory and an academic department, a special school of civil engineering, and a commercial school. The academic department comprises literary, scientific, and optional courses. The organization is military, and there are daily drills and parades. The apparatus in the various scientific departments is valuable, and the collections of specimens in natural history are extensive.

\* 1873-4.

Applicants for admission are required to be at least 15 years of age. A legislative act of 1870 provided for the education and maintenance of two indigent youths from each parish, and 20 from New Orleans, who after remaining four years at the university are required to teach two years in the state; but since 1873 the necessary appropriation has not been made. The professors of engineering, mineralogy, geology, botany, and zoology are required to make surveys of the state, and four annual reports on its botany, geology, and topography have been submitted. Straight university is open to all without distinction of race or sex, and embraces seven departments, viz.: elementary; academic, designed to impart a higher English education, or to furnish a preparation for college; normal, for the training of teachers; collegiate, which comprises the usual classical course of four years and an agricultural course of three years; law, medical, and theological. The New Orleans university, likewise making no distinction of race or sex, has preparatory, normal, collegiate, and theological departments. The other colleges in the

table have a preparatory and a collegiate course. Leland university (Baptist), in New Orleans, was incorporated in 1870. By the aid of the freedmen's bureau and of benevolent individuals grounds were bought and a building was erected, which was opened for the reception of students in November, 1873. A preparatory and a theological department are in operation, and others are to be organized. The university of Louisiana, in New Orleans, was chartered in 1847. The law department was organized the same year; in 1874 it had 4 professors and 464 alumni. A medical school, organized in 1834, became the medical department; in 1873-'4 it had 10 professors and instructors, 210 students, of whom 49 graduated in medicine and 11 in pharmacy, and a library of 2,000 volumes. The students have the use of the charity hospital as a school of practical instruction. The other departments of the university originally contemplated have not been organized. The New Orleans dental college, organized in 1867, in 1873-'4 had 8 professors and 18 students. By the act of congress of July 2, 1862, for the establishment of colleges of agriculture and the mechanic arts, 210,000 acres of land were donated to the state, which has been sold for \$182,630. This fund has been bestowed upon the "Louisiana state agricultural and mechanical college," organized by the act of April 7, 1874. It has been opened temporarily in New Orleans, but a permanent site in the country is contemplated. The act of organization appropriates \$10,000 for the purchase of land and the erection of buildings, and pledges further appropriations for those purposes to the aggregate of \$50,000. The college embraces a preparatory course of two years and agricultural and mechanical schools, in each of which the regular course is four years. Those who complete this course receive the degree of doctor of philosophy. There are professorships of chemistry and of natural philosophy and mathematics as applied to agriculture and the mechanic arts, of civil, mechanical, and maritime engineering, and of modern languages and literature; a tutor in geometrical, topographical, and free-hand drawing; an instructor in maritime science and practice (to be taught on a school ship); and tutors in telegraphy, wood engraving, and photography for female pupils. Students are admitted without distinction of race or color, and tuition is free to those who intend to enter the ministry or are nominated by members of the legislature, each senator having the right to nominate two and each representative three. Applicants must be at least 12 years old, residents of the state, and competent to enter upon the studies of the preparatory course.—The number of libraries returned in the census of 1870 was 2,332, containing 847,406 volumes, of which 1,852, with 584,140 volumes, were private. Of those not private, 2, with 64,000 volumes, were state libraries; 1, with 10,000 volumes, city; 61, with 31,583 volumes, court and law; 34,

with 37,050 volumes, school, college, &c.; 173, with 40,225 volumes, Sunday school; 183, with 60,008 volumes, church; and 26, with 20,400 volumes, circulating. There were 92 newspapers and periodicals, having an aggregate circulation of 84,165, and issuing 13,755,690 copies annually, viz.: 7 daily, circulation 34,395; 1 tri-weekly, circulation 800; 8 semi-weekly, circulation 8,500; 75 weekly, circulation 39,970; and 1 monthly, circulation 500. They were classified as follows: agricultural and horticultural, 1; commercial and financial, 2; illustrated, literary, and miscellaneous, 3; devoted to nationality, 1; political, 85. About 20 are printed wholly or partly in French. The number of church organizations was 638, with edifices, sittings, and property as follows:

DENOMINATIONS.	Number of edifices.	Number of sittings.	Value of property.
Baptist.....	208	56,140	\$846,500
Christian.....	1	800	3,000
Congregational.....	9	4,650	56,200
Episcopal.....	32	17,100	160,800
Jewish.....	5	2,200	75,000
Lutheran.....	3	1,650	28,000
Methodist.....	202	52,990	851,775
Presbyterian.....	34	14,100	185,450
Reformed (late German Reformed).....	2	800	2,000
Roman Catholic.....	102	62,525	2,836,800
Unitarian.....	1	1,000	3,000
Total.....	599	218,955	\$4,048,525

—The French after their establishment in Canada explored the Mississippi to the sea in 1682, but made no settlement near its mouth before 1699, when Iberville founded his first colony at Biloxi, now in Mississippi. In 1702 settlements were made on Dauphine island and at Mobile, now in Alabama. At this time and for 60 years afterward the Perdido river was the eastern boundary of the province of Louisiana. New Orleans, the first permanent settlement within the present limits of the state, was founded in 1718, and became the seat of the colonial government, transferred from Mobile, in 1722. In 1717 the province of Louisiana was granted, with extensive powers and privileges, to a corporation known as the "Western Company," or "Company of the Mississippi." Notwithstanding the disastrous failure of John Law's "Mississippi scheme," with which this company was intimately connected, the population and general prosperity of Louisiana were greatly advanced under its proprietorship, which continued for 15 years. Its charter was surrendered to the crown in 1732. The French remained in possession of Louisiana till 1762, when they ceded it to Spain. Little improvement was effected under the new rule, which was never popular. In 1800 it was retroceded to France, which in 1803 sold it to the United States for the sum of \$15,000,000. The region comprehended in this purchase included all the country W. of the Mississippi not occupied by Spain,

as far N. as British territory, and comprises the whole or part of the present states of Arkansas, Iowa, Kansas, Louisiana, Minnesota, Missouri, Nebraska, and Oregon, the Indian territory, and the territories of Colorado, Dakota, Idaho, Montana, Washington, and Wyoming. The American flag was first raised in New Orleans on Dec. 20, 1803. By the act of congress of March 26, 1804, the territory was divided into two governments, that of Orleans including the present state of Louisiana W. of the Mississippi and a portion E. of that river, and that of Louisiana all the country N. and W. of it. On Feb. 11, 1811, an act of congress was passed to enable the inhabitants to form a constitution and state government; and by a subsequent act of April 8, 1812, the territory of Orleans was admitted into the Union under the title of the state of Louisiana. By the act of April 14, 1812, the remainder of the region E. of the Mississippi now under the jurisdiction of the state, which, claimed by Spain, had been taken possession of the year before by the United States, was added. On June 4, 1812, the territory theretofore known as Louisiana had its designation altered to Missouri. The share that Louisiana took in the war of 1812 is familiar to all. The great battle fought at New Orleans, Jan. 8, 1815, in which the British sustained a total defeat, was the crowning event of the period, and the last hostile engagement between the two nations. New constitutions were framed in 1845 and 1852. The vote of the state at the presidential election in 1860 was: for Breckinridge, 22,681; Bell, 20,204; Douglas, 7,625. Soon after the election of Lincoln became known the governor issued a proclamation convening the legislature for Dec. 10. This body met at the appointed time, and on the following day passed an act calling a convention of the people to meet Jan. 23, 1861. The election for delegates was held Jan. 8, and the convention passed an ordinance of secession on Jan. 26 by a vote of 113 to 17, having by a vote of 84 to 45 refused to submit the question to the people. The vote for delegates, subsequently published under the auspices of the secessionists, stood 20,448 in favor of secession to 17,296 against. On March 21 the constitution of the Confederate States was ratified in convention by a vote of 101 to 7; ordinances were also passed transferring to the confederacy all fortifications, arsenals, lighthouses, &c., within the state. On Jan. 10 Forts Jackson and St. Philip, on opposite banks of the Mississippi, 75 m. below New Orleans, and commanding the approach to that city, had been taken possession of by state troops, and about the same time Fort Livingstone on Grande Terre island, Barataria bay, and Fort Pike at the entrance of Lake Pontchartrain, were also occupied. The arsenal at Baton Rouge was seized on Jan. 11, with 50,000 stand of small arms, a number of cannon, and considerable ammunition; and the United States mint and custom house at New Orleans, with

a large sum of money, were seized on the 31st. The first military movement of importance in the state was the capture of New Orleans. The federal fleet consisted of 47 armed vessels, with 310 guns and mortars, under command of Capt. (afterward Admiral) Farragut; the land forces were commanded by Gen. Benjamin F. Butler. The fleet reached the vicinity of Forts Jackson and St. Philip on April 17, 1862, and found the river defended also by an ironclad carrying 16 guns, the formidable ram *Manassas*, and a number of gunboats, fire ships, chains, and other obstructions. After several days' bombardment and the removal of some of the obstructions, Capt. Farragut ran past the forts on the 24th with some loss, destroying the confederate fleet, and reached New Orleans the next day. On the 28th the forts surrendered, and on May 1 Gen. Butler took possession of the city, the confederates under Gen. Mansfield Lovell having abandoned it. Forts Pike and Wood at the entrance of Lake Pontchartrain were also taken. On the 7th Baton Rouge was reduced by the fleet, and on Aug. 5 an attack of the confederates on the Union force stationed here was repulsed, with a Union loss of 90 killed and 250 wounded; the confederate loss being probably about the same. On Dec. 14 Gen. Banks superseded Gen. Butler, who turned over to him 17,800 men, including three regiments and two batteries of colored troops. Early in January, 1863, attempts were made to open the Atchafalaya, but the forces were withdrawn to assist Admiral Farragut in running past Port Hudson, which he accomplished on the night of March 13-14. A movement was again begun on the Atchafalaya early in April; Opelousas was occupied on the 20th, and on May 2 the Atchafalaya was open to the Red river. On May 5-9 an advance was made to Alexandria. All the state except the N. W. corner was now in possession of the federal forces. Port Hudson was invested on the land side on May 25, and was besieged until July 8, when it surrendered, Gen. Banks having in the mean time made two ineffectual assaults. Early in June the confederates under Gen. Richard Taylor reoccupied Alexandria and Opelousas, and on the 22d took possession of Brashear City, and overran the adjacent country; but after the fall of Port Hudson they retired W. of the Atchafalaya, evacuating Brashear City on July 22. The Red river expedition, which took place the following year, had Shreveport for its objective point. Gen. Banks was aided by a force under Gen. A. J. Smith and by a fleet under Admiral Porter. The rendezvous was at Alexandria, which was occupied March 16, 1864. The fleet, embarrassed by low water, could with difficulty get beyond Grand Ecore, 100 m. from Shreveport. The troops advanced to Sabine Cross Roads, where they were met, April 8, by superior forces under Gens. Kirby Smith, Taylor, Mouton, and Green, and compelled to retreat, with heavy loss. The next day the enemy at-

tacked again at Pleasant Hill, but were repulsed with loss. From this point the federals continued to retreat, somewhat harassed by the confederates, to Alexandria, where the fleet was detained by the rapids. At length (May 13) the vessels were all got over, through the engineering skill of Lieut. Col. Joseph Bailey, when the town was evacuated and accidentally burned. Soon after Gen. Banks was superseded by Gen. Canby. On Dec. 4, 1862, the first two congressional districts, comprising Orleans and adjacent parishes in the delta of the Mississippi, being in the possession of the Union forces, an election was held by order of Gen. Butler, those being entitled to vote who were qualified electors under the laws in force prior to secession, and who since the capture of New Orleans had taken the oath of allegiance. In the first district Benjamin F. Flanders and in the second Michael Hahn, both unconditional Union men, were elected, and they were subsequently admitted to their seats. Local courts were early organized by the military governors in New Orleans, and in December, 1862, a provisional court for the state, with one judge having full powers at law, in equity and admiralty, and in criminal matters, was organized by President Lincoln. In April, 1863, judges of the supreme court were appointed by the same authority. The affairs of the state continued under the control of the military, aided by these instrumentalities. On Feb. 22, 1864, in accordance with the proclamation of the president of Dec. 8, 1863, an election for state officers was held, the portion of the state within the federal lines comprising 11 parishes and parts of 6 others, having, in 1860, 233,185 inhabitants, and lying mainly in the delta E. of Bayou Teche, and along both banks of the Mississippi as far up as Baton Rouge. Qualified electors under the laws existing prior to secession, who had taken the oath of allegiance and sworn to abide by the laws and proclamations relating to slavery, were permitted to vote. Refugees and soldiers were allowed to vote in the precincts where they happened to be. Michael Hahn was elected governor, the whole number of votes cast being 11,414, and was inaugurated March 4. On the 15th he was invested by the president with the powers of a military governor. On March 28 an election of delegates to a constitutional convention was held. This body sat from April 6 to July 23, and adopted a constitution abolishing slavery and providing for the education of both colors, which on Sept. 5 was ratified by the people by a vote of 6,836 to 1,566. Five congressmen (Unionists) were at the same time chosen, who however were not admitted to seats; and a legislature was elected almost unanimously in favor of a free state, which subsequently ratified the 13th amendment to the constitution of the United States and chose presidential electors; but the vote of the state was not counted, nor were the senators admitted to seats in congress. On March 4, 1865, Gov.

Hahn, who had been elected one of the United States senators, resigned, and was succeeded by Lieut. Gov. Wells, who on Nov. 6 was re-elected. The legislature chosen at the same time, which was almost unanimously democratic, elected United States senators, who were not admitted to seats. On July 30, 1866, a riot occurred in New Orleans, which created much excitement throughout the country, and in which many lives were lost. The occasion was the reassembling of the constitutional convention of 1864, which had adjourned subject to the call of its president, and the powers of which it was asserted by some had not expired. Under the reconstruction acts of 1867 Louisiana was with Texas created the fifth military district, and placed in charge of Gen. Sheridan, who assumed command March 19. On June 3 he removed Gov. Wells, and B. F. Flanders was appointed in his stead. A registration of voters was had under the provisions of the reconstruction acts, and 45,218 white and 84,436 colored voters were enrolled. In August Gen. Sheridan was removed by President Johnson, and the command devolved upon Gen. Mower until the arrival of Gen. Hancock, Nov. 29. An election to decide the question of a convention and for delegates was held Sept. 27 and 28, when 75,083 votes were cast in favor of and 4,006 against a convention. This body met in New Orleans Nov. 23, and remained in session till March 9, 1868, agreeing upon a constitution, which was ratified at a popular election held April 17 and 18 by a vote of 66,152 to 48,739. At the same time Henry C. Warmoth, republican, was elected governor, and a legislature republican in both branches was chosen. In March Gen. Hancock was removed, and Gen. R. C. Buchanan was appointed in his place. On June 25 an act of congress was passed admitting the state to representation; and on the 29th the state legislature met, and subsequently ratified the 14th amendment and elected United States senators. Gov. Warmoth was inaugurated July 13, and the same day the government was transferred to the civil authorities. At the ensuing presidential election most of the colored voters remained away from the polls through alleged apprehension of violence from the whites, and the democratic electors received a large majority. The 15th amendment to the constitution of the United States was ratified by a vote of 18 to 3 in the senate on Feb. 27, 1869, and of 55 to 9 in the house on March 1. The state election of 1872 occurred on Nov. 4, William P. Kellogg, republican, and John McEnery, democrat, being the candidates for governor, and at the same time presidential electors were voted for. Immediately afterward serious trouble arose from charges of fraud and illegality in the election, and from the existence of boards of returning officers in the interest of each candidate, both claiming to be legal. By the one the state ticket headed by Kellogg and a legislature largely republican, and by the other McEnery

and a democratic legislature, were declared elected. As to presidential electors, one board of canvassers returned that the Grant and Wilson ticket had a majority of 14,634; the other board returned that the Greeley and Brown ticket had a majority of 6,492. In counting the electoral votes (February, 1873), congress threw out both returns from Louisiana and so the state cast no official vote for president. In January, 1873, both claimants for the governorship took the oath of office, and both legislatures assembled; but Kellogg having been recognized by the federal executive, active opposition soon ceased. On Sept. 14, 1874, Kellogg's opponents in New Orleans, under the lead of D. B. Penn, lieutenant governor on the McEnery ticket, rose in arms, and on the following morning took possession of the state house, Kellogg seeking refuge in the custom house. The president, on the call of Kellogg, issued a proclamation on the 15th commanding the Penn party to disperse within five days, and troops were ordered to New Orleans. Penn accordingly disbanded his forces, and on the 19th Kellogg returned to the state house and resumed the government.

**LOUIS NAPOLEON.** See BONAPARTE, NAPOLEON III.

**LOUIS PHILIPPE**, king of the French from 1830 to 1848, born in the Palais Royal, Paris, Oct. 6, 1773, died at Claremont, near London, Aug. 26, 1850. He was the son of Philippe Egalité, duke of Orleans, and of Louise de Bourbon de Penthièvre. On his father's side he was descended from a brother of Louis XIV.; on his mother's from the count of Toulouse, a natural but legitimized offspring of that monarch and Mme. de Montespan. His godfather was Louis XVI.; his godmother, Marie Antoinette. His earliest preceptor was M. de Bonnard. In 1782 he was placed under the care of Mme. de Genlis, whose opinions in regard to education were modelled after those of Jean Jacques Rousseau. She taught her pupils to cherish habits of hardihood and enlarged views of humanity, and he possessed a naturally philosophical and well balanced mind. In 1785, when his father became duke of Orleans, he exchanged his original title of duke of Valois for that of duke of Chartres, with the rank of a colonel in the army. Following his father's example, and notwithstanding his mother's opposition, he was carried away by the enthusiasm of the revolution of 1789, and gave his solemn allegiance to its principles (Feb. 9, 1790), took an active part in the Jacobin club, was appointed commandant of Valenciennes (August, 1791) and lieutenant general (September, 1792), and displayed much courage in several engagements, particularly at the battle of Valmy (Sept. 20) and at Jemmappes (Nov. 6). A temporary visit to England having brought his sister and Mme. de Genlis under the category of *émigrées*, they were banished from Paris; and Louis Philippe left his post to escort them to a safe retreat in

Belgium, but soon returned to aid in the bombardment of Venloo and Maestricht, and to take a brilliant share in the battle of Neerwinden (March 18, 1793). Dumouriez having incurred the suspicion of the convention, Louis Philippe shared his flight to Mons, and afterward retired with his sister and Mme. de Genlis to Switzerland. The feeling in the convention against the royal princes became in the mean time greatly exasperated. Louis Philippe was considered as an accomplice in the alleged conspiracies of Dumouriez; Marat proposed to offer a reward for his head; his father and the other members of his family were arrested, and on Nov. 6, 1793, his father was executed. Louis Philippe spent only a short time at Schaffhausen, and soon left Zürich and Zug for a refuge of greater safety, which was vouchsafed to him by a brother exile, Gen. Montesquiou, at Bremgarten in the canton of Aargau. Leaving the two ladies at the convent of St. Clara, he proceeded on foot over the Alps, accompanied by his devoted servant Baudoin, at times short of money, shelter being denied to him by the monks of St. Gotthard and in several other localities. Subsequently Montesquiou procured employment for him in a boarding school at Reichenau, in the Grisons, where he gave lessons in mathematics and geography under the name of Chabaud-Latour for several months. After learning of his father's execution he returned to Bremgarten under the assumed name of Corby; but fearing to involve his friend in difficulties, he left Switzerland for Hamburg in March, 1795. He travelled in Denmark, Sweden, Norway, Lapland, and Finland, returning to Hamburg in January, 1796. On Sept. 24 he took passage on the ship America as a Danish subject, and landed in Philadelphia, Oct. 21. In company with the duke de Montpensier and the count de Beaujolais, who after the recovery of their liberty had lost no time in joining their elder brother, Louis Philippe now made the tour of the United States, visiting Washington at Mount Vernon in 1797. The three brothers proposed to go to Spain, where their mother lived in exile, but were detained at Havana by order of the court of Madrid, and eventually compelled to return to the United States. They sailed from New York for England, arriving there in January, 1800; and after several fruitless attempts to visit Spain, they took up their abode in Twickenham, near London. The duke de Montpensier died of consumption in January, 1807, and the count de Beaujolais in June, 1808. Louis Philippe now repaired to Messina, and next to the court of Ferdinand IV. at Palermo. He there made the acquaintance of Ferdinand's accomplished and pious daughter, Marie Amélie; but being induced to accompany her brother to aid the Spanish Bourbons against King Joseph Bonaparte, he was stopped at Gibraltar by order of the British government, with whose schemes the movement did not agree, and taken to



England, where he was joined by his sister Adelaide. Shortly after they had the satisfaction of being reunited at Palermo with their venerable mother, who had been living first at Barcelona, and afterward at Figueras, since 1797. Louis Philippe's marriage with Marie Amélie took place in the royal chapel at Palermo, Nov. 25, 1809. In the spring of 1810 he again endeavored to go to Spain; but, once more thwarted by English diplomacy, he returned to Palermo, where his first child (afterward duke of Orleans) had been born during his absence (Sept. 3, 1810). His reconciliation with the elder branch of the Bourbon family having been effected in 1799, very much through their common hatred of Napoleon, the fall of the emperor permitted Louis Philippe to return to France in the spring of 1814, after an exile of 21 years. His rank in the army, the estates of his father and his own, were all restored to him, while the considerable property of the duke of Penthièvre was restored to his mother. On Napoleon's return from Elba, Louis Philippe, after an attempt at coöperation with the count of Artois, retired to England. After the battle of Waterloo he returned to Paris, and remained there till Oct. 13, 1815, when, having incurred the displeasure of the court by his opposition to its reactionary policy, he again retired to Twickenham. In February, 1817, he obtained permission from Louis XVIII. to return to France, but the title of royal highness was not accorded to him until the accession of Charles X. in 1824. With the latter he was personally on friendly terms, but vainly urged him to liberalize his policy. Louis Philippe looked upon the support of the middle classes or *bourgeoisie* as the only substantial guaranty for safety between the extremes of republicanism and absolutism. At the same time his generous hospitality to politicians, men of letters, and artists contrasted favorably with the rigid exclusiveness of the court of Charles X. The charms of his conversation fascinated all who came in contact with him, and he won public favor by the amenity of his manners and by the virtues of his domestic life. During the revolution of July, 1830, his name occurred to Laffitte, Béranger, and other leaders of the movement, as the only one which could rally the nation in support of constitutional monarchy; and after some hesitation Louis Philippe accepted the title of lieutenant general of the kingdom, his public reception at the hôtel de ville taking place on July 31, where together with Lafayette he appeared at the window with a tricolor flag, and the general embraced the duke. A provisional public administration was formed, including Dupont (de l'Eure), Gen. Gérard, Baron Louis, and Guizot, the last two names being much commented upon on account of their associations with the old dynasty. At the sitting of the chambers on Aug. 7 the constitution was modified, the forfeiture of the old dynasty pronounced, and a new one instituted,

219 out of 252 votes electing Louis Philippe as "king of the French." The peers approved the action of the deputies, notwithstanding the eloquent remonstrances of Chateaubriand. The solemn transfer of the crown took place on Aug. 9 in the Palais Bourbon, at a royal sitting of both chambers, when Louis Philippe made his entry to the sound of the *Marseillaise* and the noise of cannon fired at the Invalides, accepting the crown, and, amid the cries of *Vive le roi*, swearing faithfully to observe the modified charter. One of his first acts was the nomination of Talleyrand as ambassador to London, which bound French diplomacy to the maintenance of the treaties of 1815 and the renunciation of the Russian alliance, and laid the foundation for that between France and England. The first six years of his reign were spent in combating the legitimist, Bonapartist, and republican parties. The trial of the ex-ministers of Charles X. gave rise to serious disturbances, in appeasing which Lafayette compromised his popularity and forfeited his commandership of the national guard. Guizot, De Broglie, and their friends, the so-called *doctrinaires*, were dismissed, and Laffitte was placed at the head of the administration, Nov. 3, 1830. Universal suffrage was rejected, but a new electoral law was passed, which became the basis of what Guizot called the middle-class tory party. The leader of this party, Casimir Périer, succeeded Laffitte, March 13, 1831, and remained prime minister until his death in May, 1832. Poland was left to her fate, and after the occupation of her capital by the Russians, the announcement that "order reigns in Warsaw" was made in the chamber by Count Sebastiani. Paris became the scene of an insurrection during the funeral of Gen. Lamarque in June, 1832. This having been put down by force of arms, a new administration was formed by Soult, Oct. 11, 1832, including De Broglie, Guizot, and Thiers, which, with some modifications, continued in power until Feb. 22, 1836. In home affairs it steered between the extremes of parties, and in foreign affairs pursued a peaceful policy. Yet, King Leopold of Belgium having married the princess Louise, daughter of Louis Philippe, a French army under Gérard crossed the Belgian frontier in his interest, and after an obstinate siege conquered the citadel of Antwerp (December, 1832). In Italy the influence of Austria was counterbalanced by the occupation of Ancona (February, 1832). A quadruple alliance between France, England, Spain, and Portugal was signed in 1834. A new system of primary education was introduced, savings banks were established, and other kindred measures passed; but the revolutionary spirit, although curbed, was not crushed, and Louis Philippe's situation was surrounded with great perils, as attested by the bloody insurrections at Lyons (1831 and 1834), Grenoble, and Paris (1834), republican conspiracies by the elder Cavaignac, Marrast, and others, the attempted insurrection

in the west of the kingdom by the duchess of Berry (1832), who was punished by imprisonment in the fortress of Blaye, and especially by the numerous attempts upon the king's life, the most formidable of which was that of Fieschi, July 28, 1835. (See FIESCHI.) An attempted military insurrection at Strasburg in favor of Louis Napoleon, as a claimant of the throne, was easily suppressed (1836). From without Louis Philippe was met by the distrust of the foreign powers, especially of Russia, concerning the stability of his government. From 1836 to the end of 1840 the history of his reign is that of contests between him and the chambers, and of rivalries between Thiers, Guizot, Molé, and Soult, who were successively at the head of the administration. Thiers withdrew on account of the opposition of the king and of the chambers to his views about intervention in the affairs of Spain and of other countries, and the defeat of the Guizot-Molé cabinet was hastened by the opposition to Louis Philippe's demands for the aggrandizement of his family. Under the Molé administration, a general amnesty was granted on occasion of the marriage of the duke of Orleans with Helena of Mecklenburg, May 30, 1837; and the foundation of the national museum of Versailles, which was inaugurated June 10, was one of the great achievements of Louis Philippe's reign. A coalition of Guizot, Thiers, Odilon Barrot, Berryer, and Garnier-Pagès led to the downfall of Molé and to a ministerial crisis, which ended in placing power in the hands of Soult, who in his turn was supplanted by Thiers, March 1, 1840. During his administration the second attempt of Louis Napoleon to excite an insurrection in his own behalf took place at Boulogne, in consequence of which that prince was imprisoned in the fortress of Ham. Strikes and riots among the working classes were rife at the time, and new names were added to the list of fanatics who conspired against the life of Louis Philippe. But the principal difficulties of Thiers's administration were in connection with the conflict between the viceroy of Egypt and the sultan. Thiers wished France to interfere in favor of the former, and commenced extraordinary armaments; but found himself once more at variance with the peace policy of Louis Philippe, when a new administration under Soult and Guizot was formed, Oct. 29, 1840. Henceforth, until the revolution of 1848, Soult remained in power, but few modifications taking place in his cabinet, of which Guizot was the master spirit, and Duchâtel and Villemain were eminent members. Conspicuous among the measures of the administration were the fortification of Paris, which had been proposed by Thiers, and the law of 1842 for the establishment of the great railway lines. In 1840 the body of Napoleon was brought to Paris by the prince de Joinville, and interred in the Invalides (Dec. 15). The peace at home was not materially broken, while the war in Algeria was

carried on with continued energy, leading also to a short war with Morocco in 1844. But domestic afflictions overtook Louis Philippe, who had already been plunged in sorrow in 1839 by the death of his accomplished daughter Marie, and who was still more severely tried in 1842 by the accidental death of the duke of Orleans, whose life, if continued, might possibly have averted the revolution of 1848, and whose loss was justly considered a national calamity. In foreign affairs the long cherished *entente cordiale* with England reached its climax in 1843-'5, when visits were exchanged between the queen of England and Louis Philippe; but it was shaken by the question of indemnity for the forcible removal of the English consul Pritchard from the Society islands (see DU PETIT-THOUARS), and was seriously broken by the Spanish marriages (see ISABELLA II.), which were brought about by Louis in direct violation of his word pledged to Lord Aberdeen a year before. Among the most important events of his reign were the conquest of Abd-el-Kader, the colonization of Algiers, and the formation of an army and a school of generals who added new lustre to the arms of France. Compared with the convulsions in the earlier part of his reign, the Soult-Guizot administration was marked by calm and prosperity. In 1847, however, the shortness of the crops entailed much suffering upon the people. Scarcity caused disturbances, and bread riots broke out in various parts of the country. The democratic and socialistic press became exceedingly active; scandalous affairs in high circles were wildly commented upon; and new histories of the revolutionary period of France by Lamartine and Louis Blanc revived the republican spirit among the people. Banquets for the discussion of political reforms were proposed. One announced to be held Feb. 22, 1848, was opposed by the government, but Odilon Barrot, Ledru-Rollin, and other popular leaders insisted upon its taking place. Louis Philippe, unconscious of the coming storm, was reluctant to see it suppressed by force of arms, and at length (Feb. 23), when the government called the national guard to its assistance, that body answered with shouts of *Vive la réforme!* Numberless barricades sprang up in almost every quarter of Paris; the king's abdication in favor of his grandson came too late, his throne was burned on the Place de la Concorde, and the chamber of deputies finally sanctioned the overthrow of the monarchy (Feb. 24). On the morning of Feb. 25, when the old monarch with some members of his family had already fled from the capital, he was apprised of the proclamation of the republic. With great difficulty he succeeded in crossing the Seine with his wife from Honfleur to Havre under the name of Smith. From thence he was carried by a steamer sent for his use by the English government, and arrived on March 4 at Claremont, the palace of the king of the Belgians,

near London, where he spent the rest of his life. In 1872 his remains were brought from England to France, by permission of President Thiers, and interred at Dreux.—The most important publications on the political history of the reign of Louis Philippe are Louis Blanc's *Histoire de dix ans*, and Guizot's *Mémoires pour servir à l'histoire de mon temps*, works in which the great events of the period are considered from opposite points of view.

**LOUISVILLE**, the chief city of Kentucky, county seat of Jefferson co., situated at the falls of the Ohio, on the S. bank, about 400 m. above its mouth and 600 m. below its head at Pittsburgh, 150 m. below Cincinnati, and 45 m. W. of Frankfort, the state capital. Its

situation is one of peculiar excellence. The hills which line the river recede just above the city, and do not approach it again for 20 m., leaving an almost level plain 6 m. wide, and elevated about 70 ft. above low-water mark, which affords ample room for the growth of the city. The obstruction in the river, acting as a dam, causes it to stretch for 6 m. above into a broad smooth sheet of water, a mile in width, with very little current, and presenting a safe and convenient harbor for a great distance along the Kentucky shore. This obstruction, called "the falls," but for which "rapids" would be a more correct designation, is caused by a ridge of limestone rock running obliquely across its bed, with channels or chutes through it, modified or produced by the force of the water. There is no precipitous descent, but the fall in the course of 2½ m. amounts to 27 ft., affording great water power, of which little use has yet been made. Steamboats ascend and descend the falls in high water, but at other times pass through the Louisville and Portland canal, a work 2 m. long on the Kentucky side of the river, having three locks 480 ft. long and 90 ft. wide, and capable of passing steamboats of 3,000 tons. In 1874 control of this canal was taken by the United States government, and it was made free to commerce, excepting a small toll levied for repairs. A wing dam to throw the water into the canal and into the channel over the falls has been built by the United States government at the head of the rapids. The cost of constructing

the canal was mainly borne by the people of Louisville, the United States being the only other contributor.—Since 1810 the growth of Louisville has been steady and rapid. Its population in 1810 was 1,357; in 1820, 4,012; in 1830, 10,352; in 1840, 21,210; in 1850, 43,194; in 1860, 68,033; in 1870, 100,753, of whom 14,956 were colored and 25,668 foreigners, including 14,380 natives of Germany and 7,626 of Ireland. There were 19,177 families and 14,670 dwellings. Though at first liable to bilious and malarial fevers, Louisville has become very healthy, in consequence of its excellent system of drainage and sewerage and of the manner in which it is laid out and built. The streets are wide, and the squares large and



Louisville City Hall.

bisected each way by paved alleys 20 ft. wide. In the portion of the city devoted to residences, the houses are set back from the street, leaving lawns in front which are planted with flowers and shrubbery, and the streets are lined with shade trees. The beauty of the dwellings is a notable feature. The business portion is compactly built, and contains many fine edifices. The principal public buildings are a court house, costing more than \$1,000,000; the city hall, costing \$500,000; the custom house, city hospital, eruptive hospital, city almshouse, house of refuge for boys, house of refuge for girls, state blind asylum, United States marine hospital, industrial exposition building, Liederkranz hall, Macaulay's theatre, 10 orphan asylums, 95 churches, the medical university and

law school, and 23 excellent common school buildings, of which the female high school cost \$140,000.—Louisville is connected with the southern railroad system by the Louisville, Nashville, and Great Southern, the Louisville, Paducah, and Southwestern, and the Louisville, Cincinnati, and Lexington lines; and with the northern by the Jeffersonville and Indianapolis and the New Albany and Chicago railroads, a branch of the Ohio and Mississippi railroad, and the Cincinnati branch of the Louisville, Cincinnati, and Lexington line. The Louisville and St. Louis air-line railroad is in process of construction. The river is crossed at the head of the falls by a bridge having a single railroad track and two footways. There are 27 spans, including the canal draw, the one over the middle chute being 370 ft. long, and the one over the Indiana chute 400 ft. The channel spans are respectively 90 ft. and 96½ ft. in the clear above low water. There is a draw at the canal, giving a clear way of 114 ft. Total length of the bridge between abutments, 5,218½ ft.; cost, \$2,016,819 63. The piers are of stone and the bridge of iron. Since the building of railroads the steamboat business of Louisville has declined in importance, but regular lines of steam packets, running to New Orleans, the cities of the lower Ohio, and to Cincinnati, are still maintained. It is a port of delivery. On June 30, 1873, there were belonging to the port 44 steamers of 11,435 tons, and 11 barges of 2,372 tons; built during the year, 17 steamers of 3,302 tons, and 7 barges of 3,206 tons. The business of the city in 1873 amounted to \$250,000,000. The chief articles of shipment are dry goods, groceries, various manufactured articles, tobacco, provisions, leather, and whiskey; the receipts consist principally of dry goods, groceries, hardware, and cutlery. The value of the direct imports in 1873, under the act of 1870 allowing goods to be transported to interior ports in bond, was \$302,394. The shipments of provisions exceeded \$10,000,000 in value. The sugar-curing of hams is a special feature of the business, and in 1873 more than 900,000 were cured by 20 establishments. There are 9 pork-packing establishments, at which in 1871-'2 311,187 hogs were slaughtered; in 1872-'3, 310,746; in 1873-'4, 226,947. Louisville is one of the largest leaf-tobacco markets in the world. Large quantities are annually bought here for the account of the French government, and large shipments are made to Germany, England, and Canada. There are 8 warehouses for the storage and sale of this article, capable of holding 20,000 hogsheds, and 12 large stemmeries, in which the leaf is prepared for export. The sales for the year ending Oct. 31, 1869, were 36,130 hogsheds; in 1870, 43,002; in 1871, 48,007; in 1872, 38,356; in 1873, 53,897, valued at \$5,765,991. The manufacture of chewing and smoking tobacco and cigars is large and increasing. In

the year ending June 30, 1874, 22 tobacco factories produced 5,150,407 lbs., against a product in 1871 of 3,358,119 lbs. from 16 factories; and 86 cigar manufactories produced in 1874 13,508,119 cigars, against 8,970,456 produced by 72 makers in 1871. The manufacture of whiskey by five distilleries in 1874 amounted to 1,037,644 gals.; the same number of distilleries in 1871 produced 630,960 gals. Louisville is the great distributing market for the fine whiskeys made by the Kentucky distilleries. The manufacture of beer has become a very important interest. In 1871, 22 breweries produced 43,167 bbls.; in 1874, 19 breweries produced 72,196 bbls. Four companies are engaged in the manufacture of the Louisville cement or water lime, from the water limestone discovered during the excavation of the canal. They have 8 mills, with capacity for 1,000,000 barrels annually; capital invested, \$450,000; annual product, 500,000 barrels, valued at \$550,000. Three firms, with a capital of \$1,150,000 and employing 355 hands, are engaged in the manufacture of ploughs for the southern market; sales in 1873, 125,000, valued at \$990,000. The manufacture of heavy sole and belting leather employs six firms, with a capital of \$875,000 and 156 hands, using 9,800 cords of bark and 53,700 hides annually, and producing goods to the value of \$810,000. In the manufacture of lighter leather for skirting, harness, and upper leather, 12 tanneries are engaged, with a capital of \$485,000, employing 104 hands, using 6,350 cords of bark a year, and producing goods to the value of \$560,000. There are also a manufactory of morocco and sheep skins, 4 large saw mills, 8 furniture factories, and manufactories of iron pipes for water and gas mains. The whole number of manufacturing establishments in 1860 was 323; capital invested, \$4,563,000; hands employed, 5,894. In 1870 the number was 783; capital, \$11,119,000; hands, 11,549. On July 1, 1874, there were 6 national and 17 incorporated state banks, including 3 savings banks, with an aggregate capital of \$9,436,386; deposits, \$7,750,583; loans, \$14,321,962; cash and eastern exchange, \$2,738,343. There were also 4 private banks, 10 fire insurance companies, and 3 life insurance companies.—Louisville is divided into 12 wards, and is governed by a mayor with a board of aldermen of one and a common council of two members from each ward. It has an excellent paid fire department, with ten steam fire engines, and two hook and ladder companies. There is a fire telegraph and signal system. The police force also has a telegraph to all parts of the city. There are 114 m. of paved streets, and 23 m. of sewer conduits. The city is well supplied with water and gas by water works and gas works, which are carried on by joint-stock companies in which the city owns a controlling interest. The length of water mains is 82 m. and of gas mains 85 m. There is a good sys-

tem of street railways, 23 m. in length, mostly double tracks. The principal public work, except the canal and Ohio river bridge, is the great outfall sewer, draining the W. part of the city. It is  $4\frac{1}{2}$  m. long, varies in diameter from 3 ft. to  $11\frac{1}{2}$  ft., and in inclination from 1 in 7 to 1 in 2,000. It is built of brick, and cost \$372,427. It debouches into the river about 3 m. below the foot of the falls, through a cast-iron conduit 8 ft. in diameter, with a fall of 1 in 7, and terminates in a retaining wall of stone masonry. The bonded debt of the city, Dec. 31, 1873, was \$9,761,500. The assets of the sinking fund at that time amounted to \$4,062,098 31. The debt was principally contracted in aid of railroads. The assessed value of property in 1870 was \$71,000,000; in 1873, \$78,000,000; rate of taxation for all purposes, \$2 on the \$100.—There are many benevolent institutions, infirmaries, and homes, under charge of the churches, and numerous benevolent associations, besides many of a literary, musical, and scientific character. There are 5 daily (2 German), 2 semi-weekly (German), and 14 weekly (4 German) newspapers, and 7 monthly magazines. Louisville has an excellent system of public schools, embracing 21 graded ward schools, a male high school, a female high school, and a training school for teachers. The average number of scholars in the school year ending June, 1874, was 10,679; number of teachers, 309, besides 27 German and 4 music teachers; cost of schools for the year, \$267,354 89; value of school property, \$831,100. The education of colored children is provided for. The central colored school house cost \$25,000, and in 1874 provision was made for two other large buildings for colored schools. There were four colored schools in that year, with 24 teachers, and an average attendance of 1,059, the enrolled number of scholars being 2,381. Louisville contains two medical schools, the Louisville medical college and the medical department of the university of Louisville, which are attended annually by more than 500 students. In 1874 the organization of a third was progressing. The law department of the university has four professors. There are three public libraries, viz.: the public library of Kentucky, with 30,000 volumes; the Louisville library association, 5,690; and the Episcopal diocesan library, 2,000. The public library of Kentucky has a museum and natural history department, with 100,000 specimens. The city being the centre of one of the finest fossiliferous regions in the world, there are numerous private collections containing many excellent specimens elsewhere rare. The religious societies are as follows: Baptist, 14 (7 colored); Christian, 4 (1 colored); Episcopal, 12 (1 colored); German Evangelical, 6; Jewish, 2; Methodist, 23 (14 Southern, 3 Northern, and 6 colored); Presbyterian, 16 (1 colored); Roman Catholic, 17 (6 German); Unitarian, 1.—The first settlement within the present limits of Louisville was made by 13 families who accom-

panied Col. George Rogers Clarke on his expedition down the Ohio in 1778. The situation was so exposed to Indian attack that the first settlement was made on an island at the head of the falls, near the Kentucky shore, called Corn island, which has since disappeared. On the reception of news of the capture of Vincennes by Col. Clarke's forces these families removed to the mainland and built a station. The town was established by an act of the Virginia legislature in May, 1780, and called Louisville, in honor of Louis XVI. of France, whose troops were then aiding the struggle for American independence. It was incorporated as a city by the Kentucky legislature, Feb. 13, 1828. In its early years the settlement was greatly annoyed by the Indians. In 1862 it was threatened with an attack of the confederate forces under Gen. Bragg; and Gen. Nelson, commanding the Union forces, ordered earthworks and rifle pits to be constructed, and impressed many of the citizens to aid in the work. The arrival of Gen. Buell with the Union army saved the city from attack.

**LOUSE.** See Epizoa, vol. vi., p. 695.

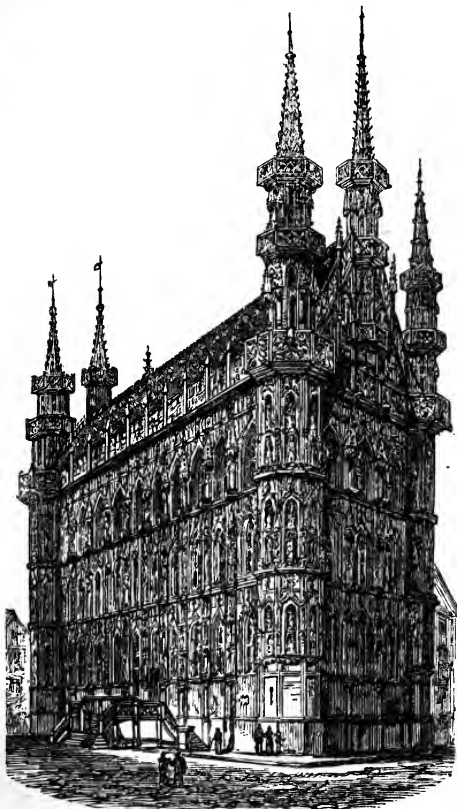
**LOUTH,** an E. county of Ireland, in the province of Leinster, bordering on Armagh, Down, the Irish sea, Meath, and Monaghan; area, 314 sq. m.; pop. in 1871, 84,198. The surface in the north is rugged and mountainous, elsewhere level and undulating, and the soil generally fertile. The principal towns are Drogheda and Dundalk. The village of Louth, 7 m. S. W. of Dundalk, contains the ruins of a celebrated priory founded by St. Patrick.

**LOUTH,** a market town of Lincolnshire, England, on the Lud, 25 m. N. E. of Lincoln; pop. in 1871, 10,500. It has two established churches, eight places of worship belonging to other denominations, a free grammar school and several other endowed schools, a mechanics' institute, a savings bank, and several charitable institutions. The chief manufactures are carpets, worsted, soap, and oil cake. It is connected by canal with the Humber.

**LOUVAIN** (Flem. *Leuven*; Ger. *Löwen*), a town of Belgium, in the province of Brabant, situated on the Dyle, 15 m. E. by N. of Brussels; pop. in 1869, 33,171. The streets are regular, but the houses are not well built. It is celebrated for its town hall, a fine Gothic building, for its cathedral, which is one of the most beautiful religious edifices in Belgium, and for its university, founded about 1425, at one time celebrated among the literary institutions of Europe, and still the leading school of Roman Catholic theology in Belgium, attended by about 800 students (6,000 in the 16th century), and containing 20 colleges (formerly 43), zoölogical and mineralogical museums, a botanic garden, and an extensive library. It was abolished by the French government in 1797, restored by the Dutch government in 1817, and again abolished by the Belgian government in 1834. In 1835 it was revived by the bishops of Belgium as a free Catholic uni-



versity. It has the largest number of professors and students among the Belgian universities. Pope Adrian VI., Baius, Jansenius, and Bellarmine were among the most celebrated professors there. St. Gertrude's church and St. Michael's are noteworthy, the former on account of its celebrated oaken stalls with detached groups, statues, and bass-reliefs, and the latter for containing many of the best paintings of modern Belgian artists. Besides the many pictures of the Flemish masters in the cathedral, Louvain possesses a private gallery containing a very valuable collection of paint-



Town Hall, Louvain.

ings by native masters. The town transacts a considerable business in the agricultural produce and manufactures of the country. The principal trade is in beer. Vessels of 150 tons can reach the town through the canal of Louvain. Although its activity is increasing, it presents a desolate aspect, compared with its appearance early in the 14th century, when it was the capital of Brabant, the residence of the dukes, and possessed a population of nearly 200,000 and nearly 4,000 manufactories of cloth. The weavers revolted against the duke of Brabant in 1382, and many of them, being banished, transplanted their industry to Eng-

land.—The foundation of Louvain is attributed by some authorities to Julius Cæsar, and the old castle is still called *château de César*, although it is known to have been built at the end of the 9th century as a defence against the Northmen. The walls of the town, built in the middle of the 12th century, now partly turned into boulevards, measure 7 m. in circumference. During the war of the Netherlands against Spain, the town submitted to Don John of Austria, and subsequently withstood a siege by William of Orange. In the 17th century it was also unsuccessfully besieged by Frederick Henry of Nassau. Taken by the French in 1746 and 1792, it fell in 1793 into the hands of the Austrians, and was retaken by Gen. Kléber in 1794 and annexed to France, as the capital of an arrondissement of the department of Dyle. An engagement between the Dutch and Belgians took place outside of its walls in August, 1831, when King Leopold narrowly escaped being captured.

**LOUVEL.** See BERRY, CHARLES FERDINAND.

**LOUVET DE COUVRAY, Jean Baptiste**, a French revolutionist, born in Paris, June 11, 1760, died Aug. 25, 1797. During his youth he was employed in a bookseller's shop, and acquired a knowledge of literature which he employed in the service of the incipient revolution by writing stories, of which the licentious *Amours du chevalier de Faublas* (1787-'9) is best known, and attained an incredible success. Louvet subsequently distinguished himself by advocating a decree against the emigrant Bourbon princes and nobility, and was employed to edit *La Sentinelle*, "a sort of pillory to which royalty was attached every morning and insulted." In 1792 he was chosen to the convention from Loiret, and assumed a more moderate position. He joined the Girondists, attacked Robespierre, was proscribed, but escaped and remained concealed until the 9th Thermidor. He was then recalled to the convention, and was elected to the council of 500. He finally became a bookseller in the Palais Royal, after marrying a beauty, the noted Lodoiska. A storm of ridicule now burst on Louvet, who had himself ridiculed others so cruelly. Overwhelmed by pamphlets and insults, the man who had placarded Paris with abuse appealed to the law. He finally died neglected and obscure. His wife, who was warmly devoted to him, wished not to survive his death, but was thwarted in her attempt to poison herself. In addition to *Faublas*, he wrote *Émilie de Valmont, ou le Divorce nécessaire* (1790); *Paris justifié*; *Récit de mes périls* (1795); and two or three comedies.

**LOUVIERS**, a town of Normandy, France, in the department of Eure, on the river of that name, 17 m. S. by E. of Rouen and 60 m. N. W. of Paris; pop. in 1866, 11,707. One of the first improved cloth manufactories in France was established here in 1681, and cotton spinning was introduced in 1789. It now contains about 40 cloth manufactories, employing in and about the town some 6,000 operatives. Among

its principal public edifices is the cathedral, partly built during the crusades, and the *maison des templiers*, a Gothic building of the 13th or 14th century. Louviers was in the middle ages surrounded by fortifications. In 1196 a treaty of peace was here concluded between Philip Augustus and Richard Cœur de Lion. During the 14th century it suffered severely, and was several times taken and lost by the English. It joined the league, and when Rouen fell into the hands of the Huguenots, its parliament assembled at Louviers.

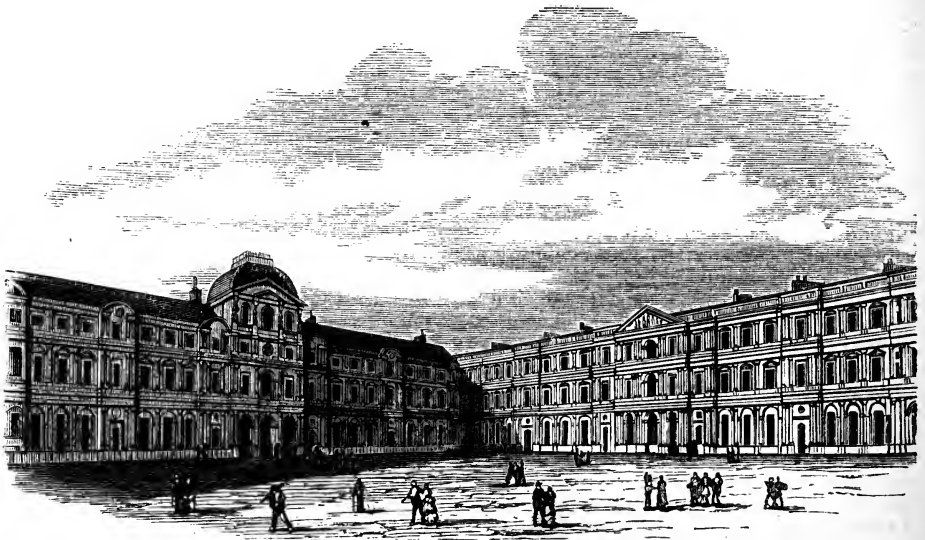
**LOUVOIS, François Michel Letellier**, marquis de, a French statesman, born in Paris, Jan. 18, 1641, died there, July 16, 1691. He was the son of Michel Letellier, chancellor of France under Louis XIV., by whose influence he was appointed a secretary to the ministry of war. At the age of 21 he married Anne de Souvré, marchioness de Courtanvaux, one of the richest heiresses in France, and soon after renounced the dissipations and pleasures of the court, to which he had been greatly addicted, and, as a preparation for his future functions, examined into the condition of the army, visited the different fortified places in the kingdom, and in various ways endeavored to impress the king favorably by his industry and capacity for business. At the same time he flattered him with the idea that the most successful measures were the result of the royal suggestions, until Louis gradually began to consider the young minister as in some sort his own pupil in the art of statesmanship. By careful management Louvois was thus enabled, in spite of his haughty and overbearing disposition, which made him unpopular with both courtiers and people, to assume and retain for more than a quarter of a century so great an ascendancy in the royal councils that Mme. de Sévigné, writing about him in 1676, said, "He possesses absolute power, and armies advance or retreat at his pleasure." From 1666, about which time he assumed the sole direction of the war department, until the peace of Nimeguen in 1678, he was incessantly employed in planning and conducting campaigns. The cruel devastation of the Palatinate during this war is generally supposed to have been instigated by Louvois. On the other hand, he conceived the plan of the Hôtel des Invalides in Paris, established hospitals and asylums in various parts of the country, and made great ameliorations and improvements in the army. In times of peace his plans for the aggrandizement of the kingdom were scarcely less magnificent than his achievements in war. He projected the palace of Versailles, the Place Vendôme in Paris, and the great aqueducts of Maintenon. After the death of Colbert in 1683 Louvois exercised almost absolute power. He was a bitter enemy of the Huguenots, against whom he eventually directed the *dragonnades*, and in October, 1685, induced the king to revoke the edict of Nantes, thereby expelling from France more than half a million of its most useful inhabitants. In 1688 war broke out between

France and the league of continental powers headed by the prince of Orange, and the energy, capacity, and unscrupulousness of Louvois became more conspicuous than ever. His dictatorial manner and affectation of supreme control, however, were beginning to incense the king; and after the siege and capture of Mons in 1691, during which he had provoked Louis by interfering with operations which he desired to carry out himself, the king reproached him with the numerous cruelties perpetrated under the royal name. Louvois declined rapidly in health, and died suddenly after a stormy interview with his master, not without suspicion of poison.

**LOUVRE**, a public building of Paris, situated in the central part of the city, near the right bank of the Seine. Before its partial destruction by the commune in 1871, it consisted of the old and the new Louvre. The old Louvre formed nearly a square 576 ft. long and 538 wide, enclosing a quadrangle of about 400 ft. square, and containing a vast collection of sculptures, paintings, and other works of art. Its E. façade, looking toward the church of St. Germain l'Auxerrois, was a colonnade of 28 twin Corinthian columns, and was one of the finest works of architecture of any age or country. The new Louvre, inaugurated in August, 1857, consisted of two lateral piles of buildings, projecting at right angles from the two parallel galleries which joined the old Louvre with the Tuileries, and forming the E. boundary of the Place du Carrousel. Between the place or square called Napoléon III. and the rue Rivoli, they presented on the E. side a frontage of nearly 300 ft. intersected by three sumptuous pavilions, which were occupied by the departments of state and of the interior, the administration of the telegraphs, library of the Louvre, and a permanent exhibition of fine arts. On the other side of the square were galleries set apart for periodical exhibitions of the works of living artists. In the central part of the building, between the gallery facing the quay and that opposite the Place Napoléon, was the council chamber which was used by the public bodies of the empire on the opening of the legislature and on other solemn occasions, and which communicated through the museum gallery with the palace of the Tuileries.—The early history of the Louvre is obscure. Saint-Foix says Dagobert I. kept his horses and hounds in a building on its site about 629. Philip Augustus repaired the edifice in the beginning of the 13th century, built a large tower, and converted it into a state prison. About the middle of the 14th century it was used as a residence for foreign princes visiting the king. Charles V. greatly embellished it, constructed gardens and terraces, and placed here the royal collection of books, which became the nucleus of the library. Charles VI. lived here in 1380, but afterward quitted it for the Tuileries. Francis I. commenced the present edifice in 1539. Charles IX. fired

from one of the windows on the fleeing Huguenots during the massacre of St. Bartholomew, Aug. 24, 1572. He and subsequent kings made great additions to the building. Henry IV. conceived the project of uniting the Louvre with the Tuileries, which to some extent was carried out by Louis XIV., mainly through the exertions of Colbert, under whose direction a powerful impetus was given to the enlargement of the palace. Louis XIV. laid the first stone of the façade from designs by Bernini, Oct. 17, 1665; but Bernini's designs were superseded by those of Claude Perrault, who in 1666 commenced the magnificent colonnade of the E. front over the grand gateway. The royal pictures were deposited here in 1681. In the middle of the 18th century the architect Gabriel was employed in finishing the façades. The work was once more interrupt-

ed by the revolution, when the Louvre was declared national property, and its contents were roughly handled by the populace. In July, 1793, all pictures, statues, vases, &c., in the royal palaces and collections were ordered to be transferred to the Louvre, and the museum was opened to the public on Aug. 10. When the great number of works of art seized in Italy by the armies of Napoleon made it necessary to assign a place for their reception, the architect Raimond was selected to conduct the work; and Percier and Fontaine, who in 1803 were charged by Napoleon with its resumption, built the great staircase of the museum proper, the museums of ancient art, the staircases on the two extreme ends of the colonnade, the Egyptian museum, the chambers for the council of state, afterward destined to receive the designs of all the various schools



Court of the Louvre.

of art, the marine museum, and other portions of the Louvre. When the allied armies took possession of Paris, the works of art which Napoleon had brought from Italy were restored to their owners. Under the restoration the work on the Louvre came to a standstill, and the initials of Napoleon, which were inscribed in many parts of the palace, were erased. After the revolution of 1848, 2,000,000 francs was devoted by the provisional government to the repairs of the old Louvre under the direction of M. Duban, who restored the Apollo gallery. The decorations of the interior were intrusted to Delacroix and other eminent artists. The resolution passed by the provisional government in favor of the completion of the whole building was put in operation July 25, 1852, when the foundation stone of the new Louvre was laid, which was

completed in 1857 at a cost of nearly 30,000,000 francs. The architect Visconti conducted the work until his death in 1853, when he was succeeded by M. Lefuel. The Louvre and the Tuileries, when connected and harmonized, formed almost one single palace of unparalleled splendor and magnitude, and occupied with their enclosures an area of nearly 60 acres. It was greatly injured by the communists in May, 1871; the magnificent library was consumed by the flames, and several of the halls of sculpture, art, and archæology fell a prey to the most reckless destruction and wanton pillage. After the restoration is completed, the distinctions of old and new Louvre will probably be dropped. In 1873 extensive relics of a temple of Apollo, excavated at Miletus at the expense of Baron Rothschild, were presented to the museum.

**LOVAT, Simon Fraser**, lord, a Scottish Jacobite, born near Inverness about 1670, beheaded on Tower hill, London, April 9, 1747. His father, Thomas Fraser, succeeded his grand-nephew in 1696 as Lord Lovat. Simon Fraser was educated at the university of Aberdeen, where he had a reputation for scholarship, and about 1694 accepted a commission in a highland regiment raised by Lord Murray. Upon his father's death in 1699 he became 13th Lord Lovat and chief of the Frasers. For several years he was engaged in a series of unsuccessful attempts to secure the estates of his cousin, the 11th lord, and effected a forced marriage with his widow, in the hope of being acknowledged the head of the house and owner of the estates. Having been outlawed for this offence, he went to France, embraced the cause of James II., and became a Roman Catholic. In 1702 he returned to Scotland as a secret emissary to stir up the highlanders in favor of the pretender; but wishing to gain the favor of the English government, he betrayed the plot to the duke of Queensberry. His treachery became known to the French court, and after his return to France he was sentenced to a confinement of ten years. The current story that in this interval he took orders and discharged the duties of a priest at the college of St. Omer is not sufficiently substantiated. During his imprisonment the heiress of Lovat, in whose person a decree of the court of session of 1702 vested the family honors and possessions, was married to Mackenzie, Lord Fraserdale; and the object of his ambition being thus apparently removed from his reach, Lovat determined to espouse the Hanoverian cause. In November, 1714, Lovat effected his escape into England, and during the insurrection under the pretender in the succeeding year he put himself at the head of the Frasers, and was instrumental in driving the insurgents out of Inverness. For his loyalty on this occasion he received a full pardon from government. Fraserdale had meanwhile joined the pretender, and, the insurrection being quelled, his estates were declared forfeited, and were subsequently conferred upon Lovat, who by cultivating friendly relations with George I. secured also a portion of the property forfeited by various highland chiefs. For many years he remained loyal, or seemingly so; but in 1729 he entered into communication with the exiled Stuarts. Subsequent to 1737 he was the head of an association of highland chiefs the object of which was to procure the restoration of the pretender, in whose cause he professed to have expended large sums of money. Nevertheless, when Charles Edward landed in 1745, he avoided committing himself in his favor until some decided success should be achieved by the Jacobites. After the defeat of Sir John Cope at Gladsmuir he sent his son with the Frasers to join the pretender's standard, while he remained at home, intending in case of need to fasten upon his

son the responsibility of the treason committed. After the battle of Culloden the evidence of his complicity became so strong, however, that he was compelled to take refuge in a remote part of the highlands, where he led a wandering life, attended by a few devoted clansmen, and "hiding in bogs and hollow trees and caverns." He was at last discovered and conveyed to London, arriving there Aug. 15, 1746. In December he was impeached in the house of lords, and on March 9, 1747, his trial commenced, during which he gave alternate proofs of extraordinary meanness, levity, and courage. He was found guilty and sentenced to be beheaded. Upon leaving the bar he exclaimed: "My lords and gentlemen, God Almighty bless you all. I wish you an everlasting farewell, for we shall not all meet in the same place again. I am sure of that." He met his fate with composure and intrepidity, repeating on the scaffold the words: *Dulce et decorum est pro patria mori*. His portrait, etched by Hogarth in 1746, represents a man of great obesity, and a heavy, sensual face. He was twice married, and upon his second wife he is said to have exercised the most terrible barbarities. A volume of autobiographical memoirs by him, written originally in French, was published in 1797. The best account of him is contained in the "Memoirs of Lord Lovat and Duncan Forbes," by J. H. Burton (London, 1847).

**LOVE FEASTS.** See **ΑΓΑΡΕ**.

**LOVELACE, Lady Augusta Ada.** See **BYRON**.

**LOVELACE, Richard**, an English poet, born in Woolwich, Kent, in 1618, died in London in 1658. He graduated at Oxford in 1636, repaired to court, and was there much admired for his amiable disposition and handsome person. He espoused the royalist cause at the outbreak of the civil war, and rose to the rank of colonel; but before the end of the struggle he retired to his native county, and became the bearer of a petition to the long parliament in favor of the king. This roused the anger of the republicans, who consigned him to prison until he found heavy bail for his peaceable deportment. In 1646 he entered the French service, and was wounded at the siege of Dunkirk. On returning to England in 1648, he was again thrown into prison, and there remained till the king had been executed. He is said to have died in great poverty. He was the author of two volumes of lyrics addressed to his mistress, under the name of "Lucastra." He also wrote "The Scholar," a comedy, and "The Soldier," a tragedy, which are lost. The earliest edition of his poems appeared in 1649; the latest, by Russell Smith, was published in 1864.

**LOVER, Samuel**, an Irish author, born in Dublin in 1797, died July 6, 1868. His father, a stock broker in Dublin, intended him for commerce, but the son's natural predilections frustrated this design. His début in public occurred at a dinner given to Thomas Moore in Dublin in 1818, when he sang a song, the music and words of which were his own, in honor

of the poet. He now became a contributor to periodicals, and about 1830 published a volume of "Legends and Stories of Ireland," of which a second series appeared in 1834. He had in the mean while adopted the profession of a portrait and miniature painter. In 1839 he published "Songs and Ballads," comprising "The Angel's Whisper," "Molly Bawn," "The Four-Leaved Shamrock," "Rory O'More," &c. Some of his brief sketches of Irish character and even his songs were subsequently expanded into elaborate fictions, such as "Handy Andy" (London, 1842), "Rory O'More," and "Treasure Trove" (1844). He also wrote a number of successful plays, operas, and extravaganzas. In 1844 he conceived the idea of reciting and singing his own works in public. After a lucrative tour in the chief towns of the United Kingdom, he visited in 1847 the United States and Canada, with equal success. Returning to England in 1848, he lectured on his transatlantic experiences, and then retired to private life. In 1859 he published "Metrical Tales and other Poems." During his latter years he received a pension of £100 a year. His "Life and Unpublished Works," by Bayle Bernard, was published in 1874.

**LOW ARCHIPELAGO, Touamotou, or Paumotu Islands,** a group of small islands in the Pacific ocean, E. of Tahiti (to which they are nominally subject) and S. of the Marquesas, between lat. 14° and 25° S., and lon. 124° and 148° 30' W.; pop. about 10,000. They number between 80 and 90, and are mostly of coral formation. The best known are Chain and Pitcairn islands (see PITCAIRN ISLAND), and the Gambier islands (which are by some considered a separate group; pop. about 2,000), near the S. border of the archipelago, the largest of which is Mangareva. They are all surrounded by coral reefs, are more elevated on their E. than their W. sides, and are covered with a luxuriant vegetation. The inhabitants are a well formed race, are peaceable, and of late years have been clothed in European fashion. The group was discovered in 1797, and in 1834 French missionaries settled in Mangareva.

**LOW COUNTRIES.** See NETHERLANDS.

**LOWE, Sir Hudson,** a British soldier, born in Galway, Ireland, July 28, 1769, died in 1844. He was the son of a surgeon general in the British army, and in early childhood went to America with his father's regiment. He was educated at Salisbury school, and received in 1787 an ensign's commission in the 50th foot, stationed at Gibraltar. He took part in the expedition to Corsica, served in Elba and Portugal, and becoming a captain was ordered in 1797 to Minorca, and organized the Corsican rangers, with which he joined the expedition to Egypt. He was engaged in the battles of Aboukir and Alexandria, led the advance of the army at Cairo, and received the proposals for the surrender of that city. His extreme vigilance, method, and zeal in this campaign drew from Sir John Moore the eulogium:

"Lowe, when you're at the outposts I always feel sure of a good night's rest." In 1803, on his return to England, he was made assistant quartermaster general, and was despatched on a secret mission to Portugal to ascertain its military condition and resources. After returning a favorable report he was ordered back to the Mediterranean to organize another corps of Corsican rangers, of which he was appointed lieutenant colonel. With this regiment he served throughout the war in Naples and Sicily. After the capture of the island of Capri, Lowe was placed in command of it with a garrison of 1,300 men, and he retained possession of it till 1808, when Gen. Lamarque with 3,000 French troops compelled him to surrender. After aiding in the conquest of the Ionian islands, he framed their provisional government, and presided over their civil as well as military administration with great success for two years. Early in 1813, together with Gen. Hope, Col. Lowe was intrusted with a mission to Sweden to induce the king to cooperate with the allies, and to Russia and Prussia to concert with the sovereigns of those countries the formation of a Russo-German legion. He was present with the allies at the battle of Bautzen, and there saw for the first time the emperor Napoleon. Subsequently he was attached as a military commissioner to the allied army under Blücher, with which he entered Paris, where he remained till the suspension of hostilities and the abdication of Napoleon, of which he brought the first intelligence to London. He was immediately knighted, and in June following created a major general. During this summer he was appointed quartermaster general of the army in the Netherlands, with the duty of reporting on the fortresses to be established on that frontier as barriers against France. He held this post when Napoleon landed from Elba, but the duke of Wellington then appointed in his place Col. Sir William Howe De Lancey, whose sister Sir Hudson Lowe afterward married. In May, 1815, Lowe was appointed to the command of a British force ordered to act in concert with an Austro-Sardinian army and Lord Exmouth's fleet, in an attack upon the southern coasts of France. He felt acutely the course of the duke of Wellington toward him; and it was owing to this fact, and as a means of soothing his feelings, that, upon the surrender of Napoleon and his banishment to St. Helena, he was selected as the governor of that island and intrusted with the charge of the great captive. Cool, firm, utterly incorruptible, and strict in carrying out instructions, possessed of a kind heart, warm feelings, and a very high sense of honor, but with a manner rendered unattractive by reason of a natural reserve and a mien rigidly military, he fulfilled his duties, which he accepted with reluctance, in a way which drew forth both severe censure and warm praise. On his return from St. Helena after the death of Napoleon in 1821, he was appointed to the



government of Antigua; but family reasons prevented his accepting it, and in 1825 he was made commander of the forces in Ceylon. In 1830 he was promoted to be a lieutenant general, and he returned to England in 1831. He wrote, in defence of his course with the captive emperor, *Mémoires relatifs à la captivité de Napoléon à Ste. Hélène* (2 vols., Paris, 1830). In 1853 the "History of the Captivity of Napoleon," from his letters and journals, was published by William Forsyth.

**LÖWE, Johann Karl Gottfried**, a German composer, born at Löbejün, near Halle, Nov. 30, 1796, died in Kiel, April 20, 1869. He was professor of music at Stettin for about 45 years. He excelled in ballads and songs for one voice, and his oratorios "Gutenberg," "Huss," "The Destruction of Jerusalem," and "The Seven Sleepers" displayed great originality. He was less successful in his operas.

**LOWE, Robert**, an English statesman, born at Bingham, Notts, where his father was rector, in 1811. He was educated at Winchester and Oxford, graduating in 1833. In 1835 he became a fellow of Magdalen college, and from 1836 to 1842 was a private tutor. In the latter year he was called to the bar, and went to Australia, where he acquired a large fortune by his practice. He was a member of the legislative council of New South Wales in 1843-'50, and for a short time represented Sydney in the legislative assembly. As a leader of the opposition party, he took an important part in elaborating the system of education which has prevailed in the colony. Having returned to England in 1851, he was member of parliament for Kidderminster from 1852 to 1859, and for Calne from 1859 to 1868. He was one of the joint secretaries of the board of control in 1852-'5, vice president of the board of trade and paymaster general in 1855-'8, and vice president of the education board in 1859-'64. He was one of the most earnest opponents of the reform bill in 1866-'7. He had even previously become very unpopular with the working classes, his election in 1857 being attended with serious riots. He declined office under Lord Derby, but in 1868 became chancellor of the exchequer and a member of the council on education under Mr. Gladstone. The same year he was elected the first representative in the house of commons for the university of London, which seat he continues to hold. In 1873 he was transferred to the post of home secretary, which he resigned on the fall of the Gladstone ministry in February, 1874.

**LÖWE, Sophie**, a German vocalist, born in Oldenburg, March 24, 1815, died in Pesth, Nov. 29, 1866. She studied under Cicemarra in Vienna, and made her first appearance there in opera in 1832. Subsequently she won much applause in Berlin, especially as Susanne in "Figaro;" but she was more successful in Germany and Italy than in Paris. She had a magnificent voice and an imposing style of beauty. She retired from the opera

in 1848, on her marriage with the Austrian general Prince Frederick of Liechtenstein.

**LOWELL**, a city and one of the shire towns of Middlesex co., Massachusetts, the third in the state in point of population, situated on the Merrimack river, at the mouth of the Concord river, 25 m. N. W. of Boston; pop. in 1830, 6,474; in 1840, 20,796; in 1850, 33,883; in 1860, 36,827; in 1870, 40,928, of whom 14,435 were foreigners, including 9,108 natives of Ireland, 3,039 of British America (mostly French Canadians), and 1,697 of England. There were 7,649 families and 6,362 dwellings. The site of the city has many inequalities, but the streets are regularly laid out, and are well paved, sewered, and lighted with gas. The principal public buildings are the court house, the city hall, the school houses, of which 15 are of brick, and the churches; and there are many elegant residences. The village of Belvidere in the E. part is the handsomest portion of the city. There are several public squares, some of which are handsomely laid out and ornamented; and in one of them is a monument erected to the memory of Ladd and Whitney, who fell in the attack upon the sixth Massachusetts regiment in Baltimore, April 19, 1861. The cemetery in the S. part of the city is well situated and handsomely laid out. Street cars accommodate local travel. The railroads centring here are the Boston and Lowell, Lowell and Nashua, Lowell and Lawrence, Stony Brook, Salem and Lowell, Framingham and Lowell, and Lowell and Andover (in progress). Lowell was long the leading cotton manufacturing city of the country, but it is now surpassed by Fall River in the number of spindles. The Pawtucket falls in the Merrimack, which has here a descent of 30 ft., are the source of its prosperity. The water power is owned by a corporation, styled "the proprietors of the locks and canals on Merrimack river," chartered in 1792, the stock of which is owned by the manufacturing companies. It leases to the companies water power to the amount of about 10,000 horse power. The canal around the falls, originally intended for navigation, was purchased and devoted to manufacturing purposes in 1821. It was enlarged and a new one built in 1847. The Wamesit power company controls and leases to manufacturers the water power on the Concord river, amounting to about 500 horse power. The capital invested in manufactures is upward of \$16,000,000; number of mills, &c., 80; number of looms, 15,189; of spindles, 678,521; hands employed, about 16,000 (6,000 males and 10,000 females); yards of cotton goods made per week, 2,660,000; of woollens, 60,000; of carpeting, 37,500; of shawls, 2,500; dozen of hosiery, 16,800; lbs. of cotton consumed, 780,000; of clean wool, 152,500; yards dyed and printed per annum, 64,951,200; steam engines employed, 50, of 6,188 horse power. The following table shows the condition of the nine principal cotton and woollen manufacturing companies in January, 1874:

NAME OF COMPANY.	Date of going into operation.	Capital.	Number of mills.	Looms.	Spindles.	Operatives.	CONSUMED PER WEEK.		Yards of cloth produced per week.
							Cotton, lbs.	Wool, lbs.	
Merrimack manufacturing company.....	1828	\$2,500,000	5 and print works	2,538	135,000	2,500	85,000	....	490,000
Hamilton company.....	1825	1,200,000	5 " " "	1,546	51,268	1,285	85,000	....	280,000
Appleton company.....	1828	600,000	1 " " "	764	27,088	520	70,000	....	160,000
Lowell company.....	1828	2,000,000	4 " " "	365	22,516	1,450	4,000	70,000	87,000
Middlesex company.....	1880	750,000	4 and dye houses	280	16,400	815	....	25,000	23,000
Tremont and Suffolk mills.	1882	1,200,000	4 " " "	2,196	93,968	1,400	100,000	....	380,000
Lawrence company.....	1883	1,500,000	5 and dye houses	2,260	90,000	1,680	165,000	1,000	400,000
Boott cotton mills.....	1836	1,200,000	6 " " "	2,368	111,872	1,875	110,000	....	460,000
Massachusetts cotton mills.	1840	1,800,000	6 " " "	2,509	93,087	1,810	150,000	....	470,000
Total.....		\$12,750,000	40	14,821	641,199	12,785	769,000	96,000	2,700,000

The Merrimack company also dyes and prints 545,600 yards per week, and the Hamilton 415,000. The Lawrence company has 550 knitting machines, and produces 12,000 dozen of cotton and merino hosiery per week. The Appleton company put a second mill in operation during 1874, which added 33 per cent. to its business. The Lowell company produces carpets, serges, and lastings; the Middlesex, beavers, ladies' sackings, opera flannels, cassimeres, and shawls; the other companies, print cloths, drillings, sheetings, shirtings, &c. Each company owns from 20 to 30 dwellings, which are leased at a nominal rent to responsible persons as boarding houses for the hands employed in the factories. Some of them are large enough to accommodate 40 or 50 inmates. None but operatives are allowed to board in them, and the sexes are kept separate. The corporations also provide a hospital in which workpeople find attendance in sickness, for which, if they be unable to pay, the employers are responsible. The Lowell bleachery, incorporated in 1832, has a capital of \$300,000, and employs 400 hands, dyeing 15,000,000 yards and bleaching 10,000,000 lbs. per annum. The Lowell machine shop, incorporated in 1845, has a capital of \$600,000, employs 1,100 hands, and manufactures cotton and paper machinery, turbine wheels, machinists' tools, hydraulic presses, force pumps, &c. Ayer's patent medicines are manufactured here. Among the smaller establishments are manufactories of hair felt, bolts, nuts, and screws, elastic goods, fixed ammunition and cartridges, belting and hose, bobbins, boilers, boxes, brass ware, wood-working machinery, cabinet ware, carriages, chemicals, sash, doors, and blinds, drain pipe, edge tools, files, wire goods, paper, reeds and harnesses, &c. There are six national banks, with an aggregate capital of \$2,350,000; six savings banks, with deposits in 1873 amounting to \$10,233,562 43; and two insurance companies.—The city is divided into six wards, and is governed by a mayor, a board of aldermen of 8 and a common council of 24 members. It has a well equipped fire department, and an efficient police force with a police court. The water works, constructed at a cost of \$1,265,000, went into operation in January, 1873. The assessed value of property in 1874

was \$36,762,005; taxation, including tax on polls, \$607,705 91, of which \$38,580 was for state and \$26,400 11 for county purposes; total expenditures of the city in 1873, \$1,218,205 55, including \$133,440 68 for schools, \$42,661 51 for school houses, \$144,257 05 for roads and bridges, \$23,069 60 for paupers, \$45,072 50 for police, \$37,309 91 for fire department, \$65,575 66 for sewers and drains, \$18,350 92 for lighting streets and public buildings, \$18,247 91 for salaries, \$46,827 02 for payment of and interest on the city debt, and \$349,717 87 for the water works. The city debt, Jan. 1, 1874, amounted to \$1,937,500. The value of property belonging to the city was \$2,418,235 23. The charitable institutions are the almshouse, which has a farm connected with it, a free dispensary, an association for aiding the worthy poor, an old ladies' home, a young women's home, St. John's hospital, and an orphan asylum under the charge of the sisters of charity. The number of school houses belonging to the city at the close of 1873 was 34; number of schools, 64 (1 high, 9 grammar, and 54 primary); number of teachers, 120, of whom 11 were males; average number of scholars enrolled during the year, 5,082; average daily attendance, 4,623; number of children between 5 and 15 years of age, 6,728. There were also four evening schools, with 39 teachers and an average attendance of 341. The whole amount expended for teachers' wages during the year was \$100,479 43. There are also several Roman Catholic schools. The city library contains 17,000 volumes, and the mechanics' library 13,000. Three daily, one semi-weekly, and four weekly newspapers are published. There are 29 churches, viz.: 4 Baptist, 6 Congregational, 2 Episcopal, 2 Freewill Baptist, 4 Methodist, 1 Presbyterian, 5 Roman Catholic (1 French), 1 Second Advent, 1 Unitarian, 2 Universalist, and 1 free chapel.—Lowell was set off from Chelmsford and incorporated as a town in 1826, and as a city in 1836. Portions of Chelmsford, Tewksbury, and Dracut have been since annexed. It had its origin in 1821, and was named after Francis C. Lowell of Boston. The population in 1874 was estimated at 50,000, a large accession having been received by annexation of territory during that year.

**LOWELL**, the name of a distinguished family of Massachusetts, descended from Percival Lowell, a merchant who emigrated from Bristol, England, in 1639, and settled in Newbury, where he died Jan. 8, 1665. **I. John**, an American statesman and jurist, born in Newburyport, Mass., June 17, 1743 (O. S.), died in Roxbury, May 6, 1802. He was the son of the Rev. John Lowell, the first minister of Newburyport, and graduated at Harvard college in 1760. He studied law, was admitted to practice in 1762, represented Newburyport in the provincial assembly in 1776, and settled in Boston in 1777. He was elected to the convention which framed the constitution of Massachusetts in 1780, took a leading part in its deliberations, and was a member of the committee by which the constitution was drafted and reported. He inserted in the bill of rights the clause declaring that "all men are born free and equal," for the purpose, as he avowed at the time, of abolishing slavery in Massachusetts; and after the adoption of the constitution he offered through the newspapers his services as a lawyer to any person held as a slave who desired to establish a right to freedom under that clause. The position maintained by him on this question was decided to be constitutional by the supreme court of the state in 1783, since which time slavery has had no legal existence in Massachusetts. In 1781 he was elected a member of the continental congress, and in 1782 was appointed by that body one of the three judges of the court for the trial of appeals from the courts of admiralty in the several states. In 1784 he was selected as one of the commissioners to establish the boundary between Massachusetts and New York. In 1789 President Washington appointed him judge of the district court of Massachusetts, and on the new organization of the United States courts in 1801 he was appointed by President Adams chief justice of the first circuit. He was one of the founders of the American academy, and for 18 years was a member of the corporation of Harvard college. **II. John**, an American lawyer and political writer, son of the preceding, born in Newburyport, Oct. 6, 1769, died in Boston, March 12, 1840. He graduated at Harvard college in 1786, studied law, was admitted to the bar before he was 20 years of age, and rose rapidly to the highest rank in the profession. In 1803 he visited Europe, where he remained three years, and after his return devoted himself chiefly to politics. Though he always refused to accept office, few men of his day in Massachusetts had so strong an influence on public opinion. His writings in the newspapers and his pamphlets, of which he published 25, were of eminent service to the federal party. From 1810 to 1828 he was the leading member of the corporation of Harvard university. He was one of the founders of the Massachusetts general hospital, and of the Boston Athenæum, savings bank, and

hospital life insurance company. For many years he was president of the Massachusetts agricultural society. **III. Francis Cabot**, an American merchant, brother of the preceding, born in Newburyport, April 7, 1775, died in Boston, Sept. 2, 1817. In 1810 he visited England on account of his health; and on his return home, shortly after the commencement of the war of 1812, he became so strongly convinced of the practicability of introducing the cotton manufacture into the United States that he proposed to his kinsman, P. T. Jackson, to make the experiment on an ample scale. (See JACKSON, PATRICK TRACY.) The result of his project was the establishment of manufactures at Waltham, and the foundation of the city of Lowell, which was named after him. He visited Washington in 1816, and his personal influence with leading members of congress contributed largely to the introduction into the tariff act of that year of the protective clause which gave an impetus to the cotton manufacture in the United States. **IV. John, jr.**, founder of the Lowell institute at Boston, son of the preceding, born in Boston, May 11, 1799, died in Bombay, March 4, 1836. He received his early education at the Edinburgh high school, and entered Harvard college in 1813; but after two years' study, his health being impaired, he made in 1816 and 1817 two voyages to India, the first to Batavia, returning by Holland and England, and the second to Calcutta. After his return he engaged for a few years in commerce, but in 1830-'31 his wife and two daughters, his only children, died in the course of a few months, and for the rest of his life he devoted himself to travel. He spent one year in traversing the United States, and then travelled through Europe, Asia Minor, Egypt, the countries on the upper Nile, Arabia, and Hindostan. His main object was to penetrate the Chinese empire from the Indian frontier. But he was prostrated by disease when he reached India, and died three weeks after his arrival. By his will, made while in Egypt amid the ruins of Thebes, he bequeathed about \$250,000 for the maintenance in Boston of annual courses of free public lectures on religion, science, literature, and the arts. The Lowell institute, as it is called, went into operation in the winter of 1839-'40, and has been highly successful. **V. Charles**, an American clergyman, son of Judge John Lowell, born in Boston, Aug. 15, 1782, died in Cambridge, Jan. 20, 1861. He received his early education at Medford and at Andover academy, graduated at Harvard college in 1800, and began the study of law, which he soon abandoned for that of theology. In 1802 he visited Europe, and studied for two years at Edinburgh, and afterward travelled on the continent, returning to the United States in 1805. On Jan. 1, 1806, he was settled as minister of the West (Congregational) church in Boston, retaining its pastorate until his death, a period of fifty-five years. In 1837-

'40 he travelled extensively in Europe and the East. Besides many occasional discourses, he published sermons (2 vols., Boston, 1855). **VI. Mary.** See PUTNAM, MARY LOWELL. **VII. Robert Trill Spence,** an American author, son of the Rev. Charles Lowell, born in Boston, Oct. 8, 1816. He was educated at Round Hill school, Northampton, and at Harvard college, where he graduated in 1833. He studied medicine and afterward theology, and in 1842 was ordained a clergyman of the church of England by the bishop of Newfoundland and Bermuda, whom he accompanied as chaplain first to Bermuda, and then to Newfoundland, where he was settled for some years as rector of Bay Robert. During a severe famine which prevailed in the island he was appointed commissioner for distributing food, became ill through overwork, and returned home. He soon after became rector of Christ church, Newark, N. J., and subsequently of Christ church in Duaneburg, N. Y., and still later principal of St. Mark's school in Southborough, Mass. In July, 1873, he became professor in Union college. In 1858 he published at Boston a novel of Newfoundland life and scenery, "The New Priest in Conception Bay;" in 1860, "Fresh Hearts that failed 3,000 Years Ago, and other Poems;" and in 1874, "Antony Brade," a story of school-boy life. **VIII. James Russell,** an American poet, brother of the preceding, born in Cambridge, Mass., Feb. 22, 1819. He graduated at Harvard college in 1838, and recited a "Class Poem," which was printed in 1839, and which contained many strokes of vigorous satire and much sharp wit. He studied law in Harvard university, was admitted to the bar in 1840, and opened an office in Boston, but soon abandoned the profession and devoted himself entirely to literature. In 1841 he published a volume of poems entitled "A Year's Life," which has never been reprinted, though many of the poems, revised by the maturer taste and judgment of the author, have been incorporated into the subsequent collections of his writings. In January, 1843, he commenced, in conjunction with Robert Carter, the publication at Boston of "The Pioneer, a Literary and Critical Magazine." Three monthly numbers were issued, containing articles from Poe, Neal, Hawthorne, Parsons, Story, and others, besides the editors, when the publishers, involved in debt by other publications, failed, and the magazine was discontinued. Mr. Lowell's next publication was a volume of "Poems" (Cambridge, 1844), comprising "A Legend of Brittany," "Prometheus," "Rhaecus," and numerous smaller pieces, among which were sonnets to Wendell Phillips and J. R. Giddings, expressing decided anti-slavery sentiments. A volume of prose, entitled "Conversations on some of the Old Poets" (Cambridge, 1845), next appeared. It is a series of essays in the form of dialogues on Chaucer, Chapman, Ford, and poets and poetry in general, interspersed with remarks on poli-

tics, slavery, and other topics. A second series of his "Poems" (Cambridge, 1848) contained "The Present Crisis," "Anti-Texas," "On the Capture of certain Fugitive Slaves near Washington," and others which obtained great popularity among the opponents of slavery. In the same year were published at Cambridge "The Vision of Sir Launfal," a poem founded upon the legend of the search for the Holy Grail, and the "Biglow Papers," a witty and humorous satire, consisting of various poems in the Yankee dialect, ostensibly by Mr. Hosea Biglow, and edited, with an introduction, notes, glossary, index, and "notices of an independent press," by "Homer Wilbur, A. M., pastor of the first church in Jaalam, and prospective member of many literary, learned, and scientific societies." This satire was mainly directed against slavery and the war with Mexico in 1846-'7. It has passed through several editions in the United States, with additions, and has been twice reprinted in England. In 1848 also appeared anonymously "A Fable for Critics," an ingenious rhymed essay upon the principal living American authors. In July, 1851, Mr. Lowell visited Europe, travelling in England, France, and Switzerland, and residing for a considerable period in Italy. He returned home in December, 1852. In the winter of 1854-'5 he delivered a course of 12 lectures on the British poets. In January, 1855, on the resignation of Mr. Longfellow, he was appointed professor of modern languages and belles-letters in Harvard college. To qualify himself more fully for the duties of the office, he went to Europe in May, and after spending a year in study, chiefly at Dresden, he returned home in August, 1856. From 1857 to 1862 he edited the "Atlantic Monthly," in which many of his writings first appeared. In 1863, in conjunction with Charles E. Norton, he assumed the editorship of the "North American Review," to which he had also been a frequent contributor, and retained the charge of it till 1872. In 1864 he published "Fireside Travels;" in 1867, a new series of the "Biglow Papers" and "Melibeus Hipponax;" in 1868, "Under the Willows, and other Poems;" in 1869, "The Cathedral," a poem; and in 1870, two volumes of literary essays, "Among my Books" and "My Study Windows." He was appointed to write the poem to be delivered on "commemoration day" at Harvard university, when memorial ceremonies were held for alumni of the university who had fallen in the civil war; and the "Commemoration Ode" then recited is one of the noblest of his poems. In 1872 he again visited Europe, returning in 1874. The degree of D. C. L. was conferred upon him in 1873 by the university of Oxford, and that of LL. D. in 1874 by the university of Cambridge, England. **IX. Maria (White),** an American poet, wife of the preceding, born in Watertown, Mass., July 8, 1821, died in Cambridge, Oct. 27, 1853. Her marriage with

Mr. Lowell took place in 1844. A volume of her poems was privately printed in Cambridge in 1855.

**LOWER, Richard**, an English physician, born in Cornwall about 1631, died in London in 1691. He was educated at Christchurch, Oxford, where he took the degree of M. D. at the age of 34. He was the first to successfully perform the operation of transfusion of blood upon the living animal, which he did upon the dog about 1665; an account of the operation was communicated to the royal society and published in the "Philosophical Transactions," vol. i. Taking up his residence in London, he was chosen fellow of the royal society and of the college of physicians. His principal publication was his *Tractatus de Corde, item de Motu et Calore Sanguinis et Chyli in eum Transitu* (London, 1669).

**LOWER EMPIRE.** See BYZANTINE EMPIRE.

**LOWESTOFT**, a seaport town of Suffolk, England, 39 m. N. E. of Ipswich; pop. in 1871, 15,246. It has a parish and three other churches, and several dissenting chapels, a theatre, an assembly room, a reading room, library, two free schools, a mechanics' institute, and a fishermen's hospital. It is the terminus of branches of the East Suffolk and Great Eastern railways. The chief branch of industry is ship building, and there are also some breweries and refineries. The trade, formerly almost confined to coasting, has received a great impetus from the formation of a harbor. In 1871 the imports were valued at £105,561; exports, £54,474. The number of entrances during the year was 178, tonnage 27,774; clearances, 133, tonnage 11,160. Near the harbor is the new town of South Lowestoft.

**LOWNDES. I.** A S. county of Georgia, bordering on Florida, and watered by the Withlacoochee and its branches; area, about 600 sq. m.; pop. in 1870, 8,321, of whom 4,045 were colored. The surface is level and the soil productive. The Atlantic and Gulf railroad passes through it. The chief productions in 1870 were 166,570 bushels of Indian corn, 47,373 of oats, 37,258 of sweet potatoes, 2,799 bales of cotton, and 34,920 lbs. of rice. There were 691 horses, 780 mules and asses, 3,243 milch cows, 7,475 other cattle, 3,473 sheep, and 14,353 swine. Capital, Troupville. **II.** A central county of Alabama, bounded N. by the Alabama river, and watered by its branches; area, about 750 sq. m.; pop. in 1870, 25,719, of whom 20,633 were colored. The surface is undulating and the soil fertile. The Mobile and Montgomery and the Western Alabama railroads pass through it. The chief productions in 1870 were 453,187 bushels of Indian corn, 23,225 of sweet potatoes, 55,517 lbs. of butter, and 18,369 bales of cotton. There were 1,081 horses, 2,706 mules and asses, 1,901 milch cows, 3,266 other cattle, and 8,465 swine. Capital, Haynesville. **III.** An E. county of Mississippi, bordering on Alabama, and intersected by the Tombigbee river;

area, 569 sq. m.; pop. in 1870, 30,502, of whom 23,022 were colored. The surface is undulating, and the soil a dark and very fertile loam. The Mobile and Ohio railroad and the Columbus branch pass through it. The chief productions in 1870 were 12,407 bushels of wheat, 429,280 of Indian corn, 12,084 of sweet potatoes, and 16,073 bales of cotton. There were 1,122 horses, 3,042 mules and asses, 3,595 milch cows, 4,035 other cattle, 2,006 sheep, and 11,893 swine; 5 manufactories of carriages, 1 of pig iron, 2 of saddlery and harness, 3 of tin, copper, and sheet-iron ware, 2 of woollen goods, 10 flour mills, and 3 saw mills. Capital, Columbus.

**LOWNDES, Rawlins**, an American lawyer, born in the British West Indies in 1722, died in Charleston, S. C., Aug. 24, 1800. His parents settled when he was very young in Charleston, where he received his education, adopted the legal profession, and practised with great success. In 1766 he was appointed by the crown associate judge. Within three months he delivered the opinion of the majority of the court, but contrary to that of the chief justice, in favor of the legality of public proceedings without the employment of stamped paper. In 1768 he moved a resolution in the colonial assembly for the erection of a statue of William Pitt, in acknowledgment of his services to the colonies and the British constitution. The measure was carried, and the statue still remains in Charleston. In 1775 he was elected a member of the council of safety, and of the committee appointed under it. In 1776 he was one of a committee of 11 appointed to draft a constitution for the province, and subsequently a member of the legislative council created by the constitution. In 1778 he was elected president of the province, and gave his official assent to the new constitution. He exerted himself energetically to resist the advance of the British forces, but, having fewer than 10,000 men in the field, was unable to resist overwhelming forces by sea and land; and after the capture of Charleston he remained for some time a prisoner. In the assembly of South Carolina he strenuously opposed the motion to accept the federal constitution, objecting to the restriction which it imposed upon the slave trade, which he declared to be the great source of the strength and prosperity of the south; to the clause giving power to congress to regulate commerce; and to the centralization of power which would accrue to the federal government. In the closing sentence of one of his speeches he said: "I wish for no other epitaph than this: 'Here lies one who opposed the federal constitution, holding it to be fatal to the liberties of his country.'" At the close of the debate the resolution was carried against him by only a single vote.—His son WILLIAM JONES, born Feb. 7, 1782, was a member of congress from 1810 to 1822, when he resigned, and died at sea, Nov. 22, while on a voyage to Europe for his health. He was



prominent in debate, strongly supported the war of 1812, was chairman of the committee of ways and means from 1818 to 1822, and was regarded by his friends as the most suitable person for president.

**LOWTH. I. William**, an English theologian, born in London in 1661, died at Buriton, Hampshire, in 1732. He graduated at Oxford in 1683, and became chaplain to Dr. Mew, bishop of Winchester, who in 1696 conferred on him a prebend in his own cathedral, and in 1699 presented him to the living of Buriton, which he retained till his death. He contributed many valuable notes to Potter's "Clemens Alexandrinus," Hudson's "Josephus," and Reading's "Ecclesiastical Historians." The principal of his own works are: "A Vindication of the Divine Authority and Inspiration of the Old and New Testaments" (Oxford, 1692); "Directions for the Profitable Reading of the Holy Scriptures" (London, 1708); and "Commentaries on the Prophets" (1714-'25.) **II. Robert**, son of the preceding, born in Winchester, Nov. 28, 1710, died at Fulham, near London, Nov. 3, 1787. He graduated at New college, Oxford, in 1737, and in 1741 became professor of poetry there, in which capacity he delivered a course of lectures on the "Sacred Poetry of the Hebrews." In 1744 Bishop Hoadley presented him to the living of Ovington, Hampshire. In 1748-'9 he travelled on the continent, in 1750 was made archdeacon of Winchester, in 1753 rector of East Woodhay in Hampshire, and was afterward nominated to the see of Limerick, but declined it for the prebend of Durham and rectory of Sedgfield. He was made bishop of St. David's in 1766, was translated to Oxford in the same year, and to London in 1777. On the death of Archbishop Cornwallis in 1783, George III. offered Dr. Lowth the primacy of Canterbury, but he declined it. His most important works are: *Prælectiones de Sacra Poesi Hebræorum* (Oxford, 1753; translated into English by G. Gregory, with notes by Michaelis, &c., 1787); "Life of William of Wykeham" (1758); "A Short Introduction to English Grammar" (1762); and a metrical "Translation of Isaiah" (1778), which is his greatest production. There have been many later editions of this and of most of his other works.

**LOXA.** See **LOJA**.

**LOYOLA, Salnt Ignatius de**, founder of the society of Jesus, born at the castle of Loyola, near Azcoytia, Guipúzcoa, Spain, in 1491, died in Rome, July 31, 1556. His true name was Don Inigo Lopez de Recalde de Loyola. The name Loyola probably comes from a device on the family escutcheon of the 10th century over the gate of the castle of Loyola, a camp kettle hung by a chain between two wolves with the words *Lobo y olla*, "The wolf and the pot." He was the youngest of 11 children, and at the age of 14 was sent to the court of Ferdinand and Isabella as page to the king, whom he accompanied in his wars against the Portuguese,

the Navarrese, the French, and the Moors, displaying a valor and capacity which soon raised him to the highest reputation. His courtly bearing was equal to his bravery, and the young soldier seemed destined for a brilliant position in the world when a wound in the leg, received while heroically defending the city of Pamplona against the French in 1521, left him a prisoner and a cripple. The reading of certain lives of the saints during his long convalescence turned his thoughts toward a religious life. As soon as his health was restored, having regained his liberty, he made a pilgrimage to the famous monastery of Montserrat in Catalonia, changed clothes with a beggar, and concealing his name and rank passed several months at Manresa, part of the time in a solitary cave, performing the "Spiritual Exercises," which he there committed to writing, and partly engaged in the most loathsome offices at a hospital. Long fasts, scourgings, and other self-imposed penances frequently brought him near to death. He was also tormented with dreadful scruples which more than once reduced him almost to despair. There he formed the design of a religious militia with its headquarters at Jerusalem. (See **JESUITS**.) He made a pilgrimage to Jerusalem, afterward studied at Alcalá and at the university of Paris, where he took his master's degree at the age of 43, gathered a few followers as a nucleus for his society, revisited his native place, and then went to Venice. There he received priest's orders, June 24, 1537, went to Vicenza with two of his companions, Lefèvre and Laynez, occupied the ruins of a convent near that city, and spent 40 days in performing the "Spiritual Exercises" as a preparation for celebrating his first mass. This however he put off doing till Christmas, 1538. In that year he went to Rome with his companions, and unfolded his plans to Pope Paul III. A bull for the establishment of the new order was granted, Sept. 27, 1540. In the following spring Ignatius was unanimously chosen general, and, having fixed his residence at Rome, he applied himself to the final elaboration of the constitutions, of which as yet only a sketch had been drawn up. His subsequent history is that of his order. Besides the common labors of benevolence in which he had been so long engaged, he founded at Rome several charitable institutions, among which were a house for Jewish catechumens, a college for German youth, an asylum for penitent women and poor girls exposed to temptation, and a founding hospital. For many years his life had been a continual sickness, and for some time previous to his death he was able to take little share in the details of government. He died alone in his room.—Ignatius was of middle stature and noble countenance, but slightly lame owing to his wound at Pamplona. He is often described as a fiery enthusiast, but nothing could be further from the truth. Though of an ardent temperament, his actions were so entirely un-

der his control that during his life he was commonly thought cold and phlegmatic. Obedience, humility, and a resignation amounting to indifference, were among the virtues which he most loved to inculcate. He was content, so long as he had not the interests of his disciples to consult, to pass for a fool and a madman; he imitated the speech and manners of the beggars whom he served in the hospitals; he was never so well pleased as when loaded with insults. His early military education had impressed upon his character a firmness which he always retained. Hence he constituted his order somewhat according to military rules, but in his personal intercourse with his disciples he displayed a paternal tenderness, and in governing and framing rules for the society he showed a prudence which has never ceased to excite the admiration of those who have least sympathy with his principles. The chief monument of Ignatius, if we except the society of Jesus itself, is the book of "Spiritual Exercises" which he composed in his solitude at Manresa. It comprises a series of meditations for the use not only of the religious but of persons in the world. "The object which he proposed and attained," says Bartoli, "was to reduce the cure of the soul to an art, by basing upon certain principles of faith an exact and perfect method, which, practised by the application of the means prescribed by him, is almost infallibly successful." The book of exercises has been translated into Latin, French, and English, and often reprinted. Ignatius was beatified by Pope Paul V. in 1607, and canonized by Gregory XV. in 1622. His festival is kept on July 31. He was early chosen as the patron saint of Maryland by the Roman Catholic colonists. Among the numerous biographies of him are those of Ribadeneira, *Vida de San Ignacio* (Madrid, 1570); Maffei, *De Vita et Moribus Sancti Ignatii Loyolæ* (Rome, 1585); Gretser, *Apologia pro Vita Sancti Ignatii* (3 vols., Ingolstadt, 1599-1604); Michael Walpole, "Life of St. Ignatius" (St. Omer, 1617); Bartoli, *De Vita Sancti Ignatii* (fol., Rome, 1650; English translation, 2 vols. 12mo, New York, 1855); Bouhours, *Vie de St. Ignace* (Paris, 1679); Genelli, *Leben des heiligen Ignatius von Loyola* (Innsbruck, 1848; English translation, London, 1871); and Stewart Rose, "Ignatius Loyola and the early Jesuits" (2d ed., London, 1871).

**LOYSON, Charles**, known as **PÈRE HYACINTHE**, a French pulpit orator, born in Orleans, March 10, 1827. He studied at the academy in Pan, and in his boyhood produced some verses which attracted notice. He entered the theological school of St. Sulpice at the age of 18, and after four years was ordained a priest. He taught philosophy at the high school of Avignon and theology at Nantes, and subsequently officiated ten years as priest in the parish of St. Sulpice. He then passed two years as a novice in the convent of the Carmelites at Lyons, entered the order, and at-

tracted much attention by his preaching at the lyceum in that city. He preached the Advent sermons in Bordeaux in 1863, and Lent sermons at Périgueux in 1864, and in the next summer went to Paris, preaching first at the Madeleine and afterward at Notre Dame (1865-'9). In 1867 he preached upon the family. The liberal tenor of some of his enunciations attracted attention, and his popularity rapidly increased. Gradually a suspicion of his orthodoxy grew up, and in 1869 he was summoned by the pope, but succeeded in clearing himself. In June of that year, however, he delivered an address before the international peace league, in which he spoke of Judaism, Catholicism, and Protestantism as "the three great religions of civilized peoples." This expression was strongly condemned by the Catholic press, and he was commanded by the general of his order at Rome to change his manner of speech or to be silent. To this he replied in a letter of Sept. 20, in which he protested against perversion of the gospel, and declared his conviction that if France and the Latin races were given up to social, moral, and religious anarchy, the principal cause was not Catholicism itself, but the manner in which Catholicism had been for a long time understood and practised. This utterance was looked upon as an attack upon the order of the church, and was hailed with enthusiasm by the opponents of the papacy. He was threatened with the major excommunication, and was practically forbidden to preach in Notre Dame. He left France for a visit to America, landing in New York Oct. 18, 1869, where he was warmly welcomed by Protestants of many denominations; but he declared that he had no intention of quitting the Catholic church, and refrained from any public speaking. He returned to France toward the end of the year. In February, 1870, the pope relieved him from his monastic vows, and he became a secular priest under the title of the abbé Loyson. He earnestly protested against the declaration of the infallibility of the pope by the council of 1870, and after the entrance of the troops of Victor Emmanuel into Rome he visited that city, where he delivered a series of discourses. In September, 1871, he attended the "Old Catholic" congress at Munich. In 1872, in a series of sermons and letters which attracted great attention, he defended the right of the clergy to marry; and in the same year he was himself married to an American lady. On Oct. 11, 1873, he was appointed one of the three curates of the Old Catholics of Geneva. Bishop Mermillod issued an interdict against these appointments, but his authority was denied by the Old Catholic body, and by Loyson himself in a published letter of Oct. 19, 1873. In August, 1874, he resigned his charge.

**LOZÈRE**, a S. department of France, in Languedoc, bordering on the departments of Cantal, Haute-Loire, Ardèche, Gard, and Avey-

ron; area, 1,996 sq. m.; pop. in 1872, 185,190. Its surface is mountainous, being traversed by various chains and spurs of the Cévennes, including Mont Lozère, nearly 5,000 ft. high, from which the department derives its name. The chains divide it into three districts. The soil is poor, and the climate severe. Three considerable rivers, the Allier, Lot, and Tarn, have their sources in the mountains of this department. Manufactures and trade are of little importance. Lead, iron, antimony, and other minerals are mined, and sheep are extensively reared. It is divided into the arrondissements of Florac, Marvejols, and Mende. Capital, Mende.

**LUBBOCK.** I. Sir John William, an English astronomer, born in London, March 26, 1803,

died in Kent, June 20, 1865. He graduated at Trinity college, Cambridge, in 1825, devoted his life to scientific labors, and published numerous papers in the "Memoirs of the Royal Astronomical Society," and in the "Philosophical Transactions of the Royal Society." Of the latter body he was for 12 years treasurer and vice president. Of these papers, an important series on the planetary and lunar theory have been published as a separate work under the title, "On the Theory of the Moon and on the Perturbations of the Planets" (8vo, 1833; 2d ed., enlarged, 1834-'6). Between 1831 and 1837 he contributed to the "Philosophical Transactions" a number of papers on the tides in the ports of London and Liverpool, for which the royal society bestowed upon him their medal on physics. He also edited the maps of the stars published by the society for the diffusion of useful knowledge, and published "Computation of Eclipses," and "Classification of the different Branches of Human Knowledge" (1838). In 1852 he was appointed deputy lieutenant of Kent. II. Sir John, an English physicist, son of the preceding, born in London, April 30, 1834. After receiving his education at Eton, he became a banker in London. He is a constant contributor to the periodical publications of archaeological, ethnological, geological, entomological, and similar associations. He has published "Prehistoric Times, as illustrated by Ancient Remains and the Manners and Customs of

Modern Savages" (1865); "The Origin of Civilization, and the Primitive Condition of Man" (1870); and "The Origin and Metamorphosis of Insects" (1873). He was elected to parliament in 1870.

**LÜBECK**, one of the three free cities of Germany, situated in lat. 53° 51' N., lon. 10° 41' E., on the Trave, 35 m. N. E. of Hamburg; area of the city and its territory, which is bounded by the Baltic, Mecklenburg, Lauenburg, Holstein, and Oldenburg, 109 sq. m.; pop. of Lübeck proper and its suburbs in 1871, 39,743, of whom 400 were Roman Catholics, 565 Jews, and nearly all the rest Protestants; total population of the territory, 52,158. The bailiwick of Bergedorf, which Lübeck formerly held in common with Hamburg, was by a



Market Place, Lübeck.

treaty of Aug. 8, 1867, left to the sole possession of the latter. The city has a cathedral remarkable for its wood carvings and paintings by Memling, and the church of St. Mary, one of the finest pointed Gothic edifices in N. Germany, contains pictures by Holbein, Vandyke, and other great masters. Conspicuous among the other public buildings is the shipowners' guildhall, and particularly the town hall or *Rathhaus*, with the famous ancient hall of the Hansa, in which the deputies from 85 cities used to meet, and in the lower story of which the senate still assembles. The Holstein and Burg gates are also objects of architectural interest, as well as the hospital of the Holy Ghost, which is the principal of the many

charitable institutions of the city. The chief educational establishment is the gymnasium. The size of the ramparts, now converted into public walks, and the quaint architecture and rich decoration of many of the houses, bear witness to the former importance and prosperity of the city, which it retains to some degree, the supreme court of the free cities of Germany being still held at Lübeck, and its commerce continuing to be of magnitude, notwithstanding the proximity to and the competition of Hamburg and Bremen. Still it has considerably declined compared with the times when the Hanse towns monopolized the traffic of half of Europe. The registered shipping in 1872 comprised 48 vessels, tonnage 11,892; of these, 24, with an aggregate tonnage of 6,006, were steamers. The entrances in 1872 were 2,457 vessels (steamers 776), tonnage 309,218; clearances, 2,237 (steamers 772), tonnage 228,340. One third of the imports come by land and river from Hamburg; the remainder by sea, even large vessels, which formerly had to discharge at Travemünde, being now, in consequence of enlargements of the port, able to come to the city. The chief imports are cotton, silk goods, hardware, and other manufactures, colonial articles, dye stuffs, zinc, &c. The exports consist mainly of corn, cattle, wool, timber, iron, and fish. The principal manufactures are tobacco, soap, paper, playing cards, linen and cotton goods, and iron. Lübeck possesses an exchange, a commercial school, and many large insurance companies. Many business transactions are carried on with Russia and Scandinavia, large steamers plying between Lübeck and Copenhagen, Stockholm, and St. Petersburg. Lübeck has a republican form of government, administered by a senate of 14 life members, of whom 8 must be literary men (6 of them lawyers), and 5 of the other 6 merchants, and by 120 delegates elected for six years. The expenditures and receipts were estimated in the budget for 1873 at \$520,000; the public debt in 1872 amounted to \$5,400,000.—Lübeck was founded, near the site of a more ancient Slavic town of the same name which had been destroyed, in the first half of the 12th century, by Adolphus II., count of Holstein, and ceded by him in 1158 to Henry the Lion, who greatly increased the prosperity of the city, and gave it the celebrated code of laws known as *das Lübische Recht*. The emperor Frederick II. conferred upon it in 1226 the privileges of an imperial free city. After that time, and especially after joining the Hanseatic league, Lübeck became a place of great commercial magnitude and political importance as the capital of the Hanse towns, and from the great enterprise of its citizens. During the thirty years' war, in the course of which a peace was concluded there between the emperor Ferdinand II. and Christian IV. of Denmark (1629), it lost its prestige, and during the wars of Napoleon it was subjected to many vicissitudes.

**LUBLIN.** I. A W. government of Russia, in the kingdom of Poland, bordering on the governments of Radom, Siedlce, Volhynia, and Austrian Galicia; area, 6,263 sq. m.; pop. in 1867, 659,483. The interior is traversed by the Wieprz, which flows into the Vistula N. of Pulawy. The surface is level and the soil fertile. II. A city, capital of the government, on the Bistrzyca, an affluent of the Wieprz, 94 m. S. E. of Warsaw; pop. in 1867, 20,789, a large part of whom are Jews. It is divided into the old and new towns, and has numerous public buildings and churches. It is the most important commercial town of the kingdom of Poland, after Warsaw and Lodz, and has also some woollen and linen manufactures.

**LÜBKE, Wilhelm**, a German historian of art, born in Dortmund, Jan. 17, 1826. He studied at Bonn and Berlin, and in 1852 published *Vorschule zur Geschichte der Kirchenbaukunst des Mittelalters*, in 1853 *Mittelalterliche Kunst in Westfalen*, and in 1855 *Geschichte der Architektur* (4th ed., 1870), which gained for him the professorship of architecture in Berlin. From 1858 to 1860 he travelled in Italy, Belgium, and France. In 1861 he became professor of art history and archaeology at Zürich, and in 1866 was called to the chair of art history in the polytechnic and art schools in Stuttgart. Besides the foregoing, and new editions of Kugler's works, he has published *Grundriss der Kunstgeschichte* (1861; 5th ed., 1871); *Abriß der Geschichte der Baukunst* (1861; 3d ed., 1868); *Die Frauen in der Kunstgeschichte* (1862); *Geschichte der Plastik* (1863; 2d ed., 1870); *Kunsthistorische Studien* (1869); and several minor writings, including the texts for the "Madonna Album" (1860), the "Titian Album" (1861), the "Paul Veronese Album" (1862), and the "Michel Angelo Album" (1863).

**LUCIA GIORDANO.** See GIORDANO.

**LUCAN (MARCUS ANNEIUS LUCANUS)**, a Roman poet, born in Corduba (Cordova), Spain, about A. D. 39, died in 65. His father was of equestrian rank, a brother of the philosopher Seneca, and carried his son at an early age to Rome, where he was educated under the best masters. His talents were soon generally noticed, and his public recitations were much admired. For reasons not precisely known, he was at enmity with Nero, and engaged in the conspiracy of Piso, in which he was betrayed. An offer of pardon induced him to turn informer; but after denouncing his accomplices, among whom was his mother Acilia, his own death was ordered by the emperor. Finding escape hopeless, he caused his veins to be opened, and died while repeating some of his own verses descriptive of this mode of death. His only extant production is the heroic poem *Pharsalia*, in 10 books, the subject of which is the struggle between Cæsar and Pompey, which was decided by the battle of that name. The 10th book is incomplete, the narrative terminating abruptly. The different spirit pervading different parts, changing from flatteries of Nero to

ferce invectives against tyranny, shows that it was composed at intervals. It reveals much poetical power, but has great defects, and has often been both admired and condemned with exaggeration. The best edition is that of Weber (Leipsic, 1821-'31). The principal English translations are by Christopher Marlowe (of the first book, 1600), May (1627), Rowe (1718), and Riley, in Bohn's "Classical Library" (1853). Durand's translation into French (Paris, 1865) and Kraiss's into German (Leipsic, 1863) are excellent.

**LUCAN, George Charles Bingham**, earl of, a British soldier, born in London, April 16, 1800. His mother, before her marriage with his father Richard, second earl of Lucan, had been the wife of Bernard Edward Howard, afterward duke of Norfolk, from whom she was divorced by act of parliament in 1794. He was educated at Westminster, and entered the army in 1816. In 1828 he joined the Russian general Diebitsch as a volunteer in the campaign against Turkey; and in 1829 he proceeded with him across the Balkan, as commander of a division of the Russian cavalry. He returned to England after the conclusion of peace at Adrianople, and retired from the army on half pay in 1836. In 1839 he succeeded to his title and property, the great bulk of which is in the county of Mayo, Ireland, and in the following year he was chosen one of the representative peers for Ireland. He devoted himself to the improvement of the Irish property, and rescued within a short time nearly 30,000 acres from a tenantry steeped in misery, but the summary ejection of whom subjected him to great odium. The duke of Wellington had great regard for his judgment on cavalry matters; and on the outbreak of the war with Russia he was appointed commander of a division of cavalry in the Crimea. Lord Lucan was wounded before Sebastopol, but his name is most conspicuously associated with the celebrated cavalry charge at Balaklava (Oct. 25, 1854), the order for which was transmitted from Lord Raglan through him to Lord Cardigan, his brother-in-law. His conduct, together with that of Cardigan, was made the subject of an investigation by the Crimean board of inquiry, which however did not result in an incrimination of either. Lucan was made lieutenant general in 1858, and general in 1865.

**LUCANIA**, in ancient geography, a division of southern Italy or Magna Græcia, bounded N. W. by Campania, from which it was partly separated by the river Silarus (now Sele), N. by Samnium, N. E. by Apulia, from which it was separated by the Bradanus (Bradano), E. by the Tarentine gulf, S. by Bruttium, and W. by the Tyrrhenian sea. The territory is mountainous, excepting a fertile and extensive plain between the Apennines and the gulf of Taranto. Besides the rivers above mentioned, it was watered by the Tanager (Negro), an affluent of the Silarus, the Laus (Lao), which falls into the Tyrrhenian sea on the confines of

Bruttium, the Siris (Sinno), which flows into the Tarentine gulf, and numerous other streams. Among the principal towns flourishing at various periods were Metapontum, Heraclea, Sybaris, and Thurium or Thurii on the eastern coast, Posidonium or Pæstum and Elea or Velia on the western, and Pandosia and Potentia in the interior. The original inhabitants of Lucania were the Chones and Enotrians, who, like most of the Greeks who settled on the coasts, were gradually subdued by Samnites from the north. Lucania rose quickly to such importance that a league was formed against it by the cities of Magna Græcia about 393 B. C. The Lucanians triumphed in a great battle fought in 390, and the younger Dionysius concluded a treaty with them in 358. They were subjected by the Romans in 272, and in the civil war between Marius and Sulla in 88 their nationality was extinguished.

**LUCAS. I.** A N. W. county of Ohio, bordering on Michigan and Lake Erie, bounded partly on the S. by the Maumee river, and drained by the Ottawa river and Swan creek; area, 420 sq. m.; pop. in 1870, 46,722. It is traversed by the Wabash and Erie canal, and several railroads centre at Toledo. It has a level surface and fertile soil. The chief productions in 1870 were 120,895 bushels of wheat, 242,502 of Indian corn, 135,157 of oats, 200,052 of potatoes, 54,067 lbs. of wool, 314,533 of butter, and 24,319 tons of hay. There were 3,875 horses, 4,346 milch cows, 4,250 other cattle, 11,029 sheep, and 8,167 swine; 2 manufactories of agricultural implements, 12 of carriages, 16 of cooperage, 1 of files, 6 of furniture, 1 of pig iron, 4 of iron castings, 1 of wine, 5 of machinery, 1 of paper, 7 of sash, doors, and blinds, 4 of tobacco and snuff, 5 tanneries, 4 currying establishments, 5 breweries, 6 flour mills, 12 saw mills, and 2 ship building and repairing establishments. Capital, Toledo. **II.** A S. county of Iowa, drained by branches of the Chariton and Des Moines rivers; area, 432 sq. m.; pop. in 1870, 5,287. The surface is rolling, with prairies and forests, and the soil generally fertile. The Burlington and Missouri River railroad and the Chariton branch pass through it. The chief productions in 1870 were 139,087 bushels of wheat, 597,322 of Indian corn, 174,889 of oats, 54,274 of potatoes, 59,106 lbs. of wool, 397,894 of butter, and 14,680 tons of hay. There were 4,665 horses, 3,690 milch cows, 7,642 other cattle, 17,210 sheep, and 17,536 swine. Capital, Chariton.

**LUCAS, Charles Jean Marie**, a French economist, born in St. Brieuc, May 3, 1803, died in Paris, May 6, 1874. He became an advocate, and from 1830 to 1853 was inspector general of prisons in the ministry of the interior; afterward until 1865 he presided over the board of inspectors general in the same ministry. In 1847 he founded the agricultural penal establishment at Val d'Yèvre. Among his works are *Du système pénitentiaire en Europe et aux États-Unis*, which gained the Montyon prize



(3 vols., 1826-'30), and *De la réforme des prisons, ou de la théorie de l'imprisonnement* (3 vols., 1836-'38). He wrote several essays advocating the abolition of capital punishment, and not long before his death addressed to the Italian statesman Mancini a communication published under the title, *La peine de mort et l'unification pénale*, &c. (Paris, 1874).

**LUCAS, Frederick**, an English journalist, born in London, March 30, 1812, died at Staines, Middlesex, Oct. 23, 1855. His family belonged to the society of Friends. His education was commenced at a Friends' school in Darlington, and continued at the London university, where he remained three years. In 1835 he began the practice of law, in which he had good success. Four years later he entered the Roman Catholic church, and published a pamphlet entitled "Reasons for becoming a Roman Catholic," addressed to the society of Friends. It is a very clear and vigorous exposition of the motives which induced him to take so important a step. He founded at London the "Tablet," a newspaper since widely known as an advocate and exponent of Catholic views, and contributed to the "Dublin Review." In 1849 he transferred the "Tablet" to Dublin, and in 1852 was returned to parliament by the county of Meath. He maintained, against the judgment of the most influential members of the Irish Roman Catholic hierarchy, the right and duty of the Irish priests to take an active part in politics. In 1854 he went to Rome for the purpose of explaining his views on the subject to the pope in person; but his impaired health compelled him to return before a decision could be obtained. During his brief parliamentary career he came to be considered as the leader of the Catholic party.

**LUCAS, John**, an English painter, born in London, July 4, 1807, died there, April 30, 1874. He was originally an engraver in mezzotint, but in 1829 became a portrait painter. Among his works are portraits of members of the royal family, of the duke of Wellington for the university of Oxford, of Prince Albert for Versailles and for the palace of Saxe-Coburg, and of many distinguished persons for the gallery of Sir Robert Peel. One of his best pictures is a portrait group representing the consultation of Robert Stephenson, Brunel, and other eminent engineers previous to the floating of the last section of the tubular bridge over the Menai strait. More than 60 of his works have been engraved.

**LUCCA. I.** A province of central Italy, bounded N. by Massa e Carrara and Modena, E. by Florence, S. by Pisa, and W. by the Ligurian sea; area, 576 sq. m.; pop. in 1872, 280,399. It is a mountainous district, crossed in the east by the Apennines, and with only one river, the Serchio, which is not deep enough for navigation. Near the sea the land is low and marshy. The soil is not naturally fertile, but is highly cultivated, and yields principally olives, chestnuts, figs, almonds, and

citrons. Much attention has recently been given to the culture of the mulberry, but the grain produce is still below the amount needed for home consumption. **II.** A city, capital of the province, in a fertile valley watered by the Serchio, 10 m. N. E. of Pisa, and 38 m. W. of Florence; pop. in 1872, 63,204. The streets are well paved. The principal squares are the Piazza Ducale, Piazza S. Michele, and Piazza del Mercato. The last, which is the most remarkable, and in which the market has been held since 1839, occupies the site and preserves the form of the ancient amphitheatre, which had two stories of 54 arches each, and could accommodate with seats nearly 11,000 spectators. The chief public buildings are the town house, the public library, the ducal palace, the Palazzo Pretorio, the Palazzo Mansi, and the Palazzo Borghi (now used as a pauper asylum). Adjoining the last are the so-called Scaligerian castles and a lofty tower, this palace as well as some others of Lucca having been originally intended for purposes of defence as well as for habitation and state. There are about 40 churches. The cathedral, dedicated to St. Martin, is of the 11th century, with archiepiscopal archives abounding in ancient historical documents, adorned with paintings by Tintoretto and other masters, with statuary and other works of art by Civitali and various eminent sculptors, and with a memorial known as the "altar of Liberty;" a small chapel near the altar contains an ancient crucifix carved of cedar wood, famous as a miraculous relic. Lucca possesses an academy of letters and sciences founded in 1817, and a number of educational and charitable institutions. Cotton, wool, paper, and cloth manufactures contribute to the industrial activity of Lucca. The celebrated baths of Lucca are about 14 m. from the city, near the towns of Ponte a Seraglio, Bagni alla Villa, and Bernabo. The water of the springs contains Glauber and bitter salts, and has a temperature ranging between 90° and 110°.—Lucca (*Luca*) was anciently included within the limits of Etruria; but as no Etruscan remains have been discovered in its neighborhood, it is very doubtful whether it was an Etruscan town. Livy mentions it as having given shelter to Sempronius when he retired before Hannibal, 218 B. C. The town fell into the hands of the Ligurians, and became a Roman colony in 177. It became a Lombard duchy in A. D. 572, was subsequently annexed to the Frankish and the German empires, and having regained its independence, became a republic early in the 12th century. It carried on wars with Pisa and Florence, was for a time under the sway of Castracani (1316-'28), succumbed to the Pisans shortly after, was liberated from their yoke by the emperor Charles IV. in the latter part of the 14th century, again became the prey of several petty tyrants, and eventually recovered its independence and formed a government, ruled by an aristocracy. An at-

tempt to establish a more popular government made by the gonfaloniere Burlamacchi toward the middle of the 16th century failed, and its instigator was put to death. The Martinian law passed soon afterward, and so called after its author, the gonfaloniere Martino Bernardini, established a close form of aristocratic government resembling that of Venice, only a certain number of families being made eligible to office. In 1797 Lucca was seized by the French, and in 1805 it was given by Napoleon as a principality to his sister Elisa Bacciochi. After his fall it was occupied by Austria, and the Spanish infanta Maria Louisa was invested with the regency of Lucca, which however was to revert to Tuscany as soon as the death of the Austrian Maria Louisa had reinstated the Spanish Maria Louisa and her son upon the throne of Parma. The latter princess was succeeded, March 13, 1824, by her son Charles Louis, who had married in 1820 a daughter of the future king of Sardinia, Charles Albert. This prince spent most of his time abroad. Ward (died in 1858), an English groom, who left Yorkshire as a boy in the pay of Prince Liechtenstein, and spent some years as a jockey in Vienna, ingratiated himself with the duke of Lucca, who promoted him from the stable to his household as valet, which service he performed up to 1846, when he was made master of the horse. Eventually he officiated as minister of the household and minister of finance, and was the ruling spirit of the duchy, until the retirement of the duke in 1847, afterward joining the service of the duke of Parma. Shortly after the outbreak of the Italian movement in 1847, the duke ceded Lucca (with the exception of some minor parts reverting to Modena and Parma) to Tuscany, of which it remained a province till March, 1860, when it was annexed to the dominions of Victor Emanuel.

**LUCCA, Pauline**, a German vocalist, born in Vienna, April 25, 1842. Her parents were poor Jews, and when 14 years old she was placed in the chorus of the Kärnthnerthor theatre. At 17 she accepted an engagement at the theatre of Olmütz, there taking her first leading rôle, that of Elvira in *Ernani*, Sept. 7, 1859. The following season she sang at Prague, and in 1861, through the influence of Meyerbeer, she obtained an engagement at Berlin, where she at once established herself as a favorite, and remained till 1872, but filled short engagements at the opera houses of London, St. Petersburg, and other cities. In 1865 she married Baron von Rhaden, a former Prussian army officer, from whom she was divorced after her arrival in the United States. On Sept. 30, 1872, she appeared at the New York academy of music. She possesses a pure and resonant soprano voice of great power and beauty, and combines with her qualities as a vocalist great dramatic ability. She is more distinguished for breadth of style than for facility of execution. Her repertory is large, and she has sung in more than 40 German and Italian operas.

**LUCENA**, a town of Andalusia, Spain, in the province and 34 m. S. S. E. of the city of Cordova; pop. about 20,000. It is chiefly inhabited by an agricultural population and provincial gentry. Manufactures of coarse linens, earthenware, &c., are carried on. In the environs are esteemed medicinal baths. The Moors besieged this city in 1483, and were defeated.

**LUCERA**, or *Nocera*, a town of S. Italy, in the province and 10 m. W. N. W. of the city of Foggia; pop. about 15,000. It is the seat of a bishop, and has a cathedral which was formerly a Saracenic mosque, a college, and a fine private museum. The present town was built in the 13th century on the site of Luceria, one of the most ancient towns of Apulia, which was destroyed by the Byzantines. The first inhabitants were Saracens who had been expelled from Sicily, and to whom the emperor Frederick II. granted a refuge.

**LUCERN** (*Medicago sativa*), a forage plant of the family *leguminosæ*, and related to clover



Lucern (*Medicago sativa*).

(*trifolium*) not only in its botanical characters but in its agricultural uses. The derivation of the word is obscure, but it is supposed by some to be from the Swiss canton of the same name; it is known in Spain as *alfalfa*, which name it bears also in Spanish American countries, and is still retained in California and New Mexico. The root of lucern is perennial, from which arise erect, smooth, branching stems, 2 ft. or more high; the leaves are pinnately trifoliate, the leaflets obovate-oblong, toothed; the flowers, instead of being in a dense head as in clover, are in erect racemes; the corolla is violet-purple, and the many-seeded pod is spirally coiled. The generic name is from the Greek *Μηδική*, as it came to the Greeks from Media; it was probably cultivated several centuries before Christ, and came into European agriculture through the south of France and Spain. Lucern has never been much grown in England or in the older United States, but

on the continent of Europe and in our far southern and western states it is regarded as of great value; its reputation on the Pacific coast has led agriculturists at the east to experiment with it, and it is likely to occupy a more prominent place in our agriculture than it has hitherto held. The experiments of Chancellor Livingston near the close of the last century called the attention of farmers to lucern as a valuable forage plant, but our agriculture was not then sufficiently advanced to make its culture profitable; it is only where draining and improved tillage are practised that its value is manifest. The plant has very long roots, which have been known to penetrate to 12 ft. or more; hence it is quite unsuited to light thin soils with a poor subsoil. Another obstacle to its introduction is the care demanded by the young plants; the seed must be sown in drills in well prepared soil, and the plants kept free from weeds until they have become thoroughly established; when the roots once get possession of the soil, they continue under favorable conditions to produce crops of herbage almost indefinitely. Like clover and other leguminous plants, it draws largely upon the atmosphere for its sustenance, and its wide-spreading roots in their decay enrich the soil with vegetable matter, while they at the same time mechanically disintegrate it. After a thorough preparation of the soil the seed is sown in drills from 18 to 30 in. apart; it should be cropped but lightly the first year, if at all; in its third year it is in full bearing, and may afterward yield from three to five crops each season. The cut-

ting should be done as the plant is about to flower, and not be delayed until the stems become woody; it may be cured like clover, but its great value is as a soiling crop to feed in the fresh state to dairy cows and other animals; the yield in hay per acre is variously estimated at from three to eight tons. In California, where it is generally known as alfalfa, or Chilian clover, it is regarded as the mainstay of the stock raisers, and with irrigation it produces enormous crops.—Another *Medicago* (*M. lupulina*), called black medick and non-such, a prostrate yellow-flowered species with black pods, is a common introduced plant in this country, and in England is regarded as a valuable sheep pasturage. The bur clover of California (*M. denticulata*) is still another introduced species; in California it covers large tracts, and its bur-like pods remain upon the ground during the dry season, and afford a concentrated food to animals at a time when no green forage is to be obtained.

**LUCERNE** (Ger. *Luzern*). I. A central canton of Switzerland, bounded N. by Aargau, N. E. by Zug, E. by Schwytz, S. E. and S. by Unterwalden and Bern, and W. by Bern; area, 579 sq. m.; pop. in 1870, 132,338, of whom all but about 4,000 were Roman Catholics. With regard to the language spoken, Lucerne is one of the 14 purely German cantons. The southern part of the canton belongs to the basin of the Reuss, and the northern part to that of the Aar. The former river flows through the lake of Lucerne. The other principal sheets of water are the Sempach and Baldegg (or Heidegg) lakes. The lake of Pilatus, which is associated



Lucerne.

with this canton by several historians of the middle ages, has been drained. The canton is not mountainous excepting in its S. portion, on

the borders of Unterwalden and the Bernese Oberland, where however even the highest peaks of the Pilatus do not attain the limits

of perpetual snow. This mountain group is situated S. W. of the town of Lucerne, extending along the borders of Lucerne and Unterwalden. The highest of the seven peaks of this group are the Oberhaupt and the Tomlishorn, about 7,000 ft. high. The soil is fertile, and yields more corn than is needed for the population. The rearing of cattle, however, is the principal branch of industry. Fruit trees abound, and the vine is cultivated to some extent. There are also some manufactures of linen, cotton, and other goods, and some commerce is carried on with Italy by the St. Gothard pass. The canton sends seven members to the national council of Switzerland. It early joined the Swiss confederation. After 1830 it belonged to the so-called "regenerated cantons," but its liberal constitution was overthrown in 1841 by the ultramontane-popular party, which led to the bringing in of the Jesuits in 1844, and the war of the Sonderbund in 1847, Lucerne being the head and centre of the seven Catholic cantons. (See SWITZERLAND.) A new constitution was adopted in March, 1863. According to it, the canton is divided into 25 electoral districts, which elect 100 members of the grand council for a term of four years. The grand council elects from its number a governing council (*Regierungsrath*) of seven members, also for a term of four years. Its president is elected by the grand council for one year, and has the title of *Schultheiss* or *Statthalter*. II. A city, capital of the canton, at the N. W. extremity of the lake of Lucerne, 40 m. E. by N. of Bern and 25 m. S. S. W. of Zürich; pop. in 1870, 14,524. It is in sight of the snowy Alps of Schwytz, and 10 m. from Mount Rigi, is traversed by the river Reuss, and connected through the central Swiss railway with the principal towns of Switzerland. The town is surrounded by a circle of ancient watch towers, and is walled in on the land side. The chief curiosities of Lucerne are the bridges which span the Reuss, viz.: the *Muhlenbrücke*, which is decorated with paintings nearly obliterated of the "Dance of Death," the *Reussbrücke*, and the *Kapellbrücke*. Against the timbers supporting the roof of the last are suspended nearly 80 pictures illustrative of the patron saints of the town and of Swiss history. The *Hofbrücke*, the largest bridge, was removed in 1852, and a new bridge has been built over the river where it issues from the lake. Commerce and industry are not very extensive. In the northern suburbs of the city is the monument erected in 1821 in honor of the Swiss guards who fell in the defence of the Tuileries, Aug. 10, 1792, the model for which was designed by Thorwaldsen. III. **Lake**, a body of water bordering on the cantons of Uri, Unterwalden, Schwytz, and Lucerne, and hence called *Vierwaldstädter-See*, "lake of the four forest cantons." It lies at a height of about 1,400 ft. above the level of the sea, and branches in different directions, its

various bays being named after the chief places situated on them. The W. branch is thus called the lake of Lucerne in the narrower sense; the bay of Alpnach is on the south, that of Küssnacht on the north, and Buochs stretches east and west; while the bay of Uri constitutes the S. E. end of the lake. The total length is about 25 m.; the breadth varies greatly. Its scenery is superb. The patriotic (according to recent criticisms, legendary) deeds of William Tell took place on its shores. Perched on a cliff of the bay of Küssnacht is the ruined castle of New Hapsburg, and near it a fortress which belonged to the counts of Hapsburg, the progenitors of the imperial Austrian dynasty. The lake is visited by violent gales, blowing at the same time from opposite quarters in different parts of it.

**LUCHETTO DA GENOVA.** See CAMBIASO.

**LUCIAN** (Lat. *Lucianus*, Gr. *Λουκιανός*), a Greek author, born in Samosata, on the Euphrates, about A. D. 120, died in Egypt about 200. His parents being too poor to give him a learned education, he was apprenticed when about 14 years of age to his maternal uncle, a reputable sculptor in his native city. Receiving a severe flogging for an act of carelessness, he returned home, and devoted himself to the study of rhetoric and literature. He travelled for some time in Ionia, and having completed his studies began to practise as an advocate at Antioch; but, meeting with no success, he was driven to writing speeches for others. He next visited the greater part of Greece, Italy, and Gaul, giving lectures in the cities. At Athens he made himself familiar with the Attic dialect, and cultivated an acquaintance with the philosopher Demonax. In Gaul he appears to have remained for several years, and here he chiefly gained his professional reputation, and made himself rich. On returning to his native country, he applied himself to writing, but still travelled occasionally, visiting Ionia and Achaia about 160 or 165, and Paphlagonia about 170. While in Paphlagonia he planned various contrivances for exposing the impostures of the pseudo-prophet Alexander, who accordingly ordered the crew of the vessel in which Lucian was returning home to throw him overboard. From this fate he was saved only by the intervention of the captain, who had him conveyed out of the ship and set on shore. In his latter days he was appointed procurator of part of Egypt, and was in expectation of a proconsulship when he died.—The works of Lucian are of a very miscellaneous character. The best known are his "Dialogues," compositions exhibiting various degrees of merit, and every variety of style, from sober seriousness to the broadest humor and buffoonery. They are in general directed against the gods, philosophers, and absurdities of paganism, which, according to Suidas, procured him the surname of the Blasphemer. In the "Sale of the Philosophers" the founders of the different sects are put up to auction, Mercury being

the auctioneer. Pythagoras brings 10 minæ; Diogenes, with his rags and cynicism, but 2 oboli; for Democritus and Heraclitus there are no bidders; Socrates is knocked down to Dion of Syracuse for 2 talents; Epicurus goes for 2 minæ; Chrysippus the Stoic is bought for 12; while Pyrrho, whose price is not mentioned, persists in doubting whether he has been disposed of or not, even after having been sold, paid for, and delivered. "The Banquet," or "The Lapithæ," is one of the most humorous of all Lucian's dialogues. The scene is a wedding feast at which a representative of each of the principal philosophic sects is a guest. The unlettered portion of the company behave with propriety; but the philosophers commence a discussion which ends in a pitched battle. The "Dialogues of the Dead" have found numerous and distinguished modern imitators, including Fontenelle, Voltaire, and Lord Lyttelton. The earlier editions of Lucian's works are those of Florence (1496) and Venice (1503). The best are those of Hemsterhuis and Reitz (3 vols. 4to, Amsterdam, 1743); and Lehmann (9 vols. 8vo, Leipsic, 1821-'31). There is an incomplete English version by Dr. Thomas Franklin (4 vols. 8vo, London, 1781); a much superior German one by Wieland (6 vols., Leipsic, 1788-'9); a French translation by De Ballu (6 vols., Paris, 1788); an Italian translation by Manzi (1819-'20); an English version of the entire works by William Tooke (2 vols. 4to, London, 1820); selections, with English notes, by Evelyn Abbott (London, 1872); and an English translation by W. Lucas Collins (Edinburgh, 1873).

**LUCIAN, Saint**, an early Christian theologian, born in Samosata about the middle of the 3d century, died in Nicomedia about 310. Having lost both his parents when 12 years old, he distributed his inheritance to the poor, and removed to Edessa, where he was baptized, and became the pupil of Macarius, a Christian famed for his Biblical learning. Having been admitted to orders, he went to Antioch, and there opened a theological school, attended by numerous students. He was excommunicated for heresy by three successive bishops of Antioch, and remained without the pale of the church for several years. He was in fact the founder of Arianism, and even the great leader who subsequently gave name to that form of doctrine did not disdain to avow himself his disciple, as is evident from a letter addressed by him to Eusebius of Nicomedia, in which he calls that prelate "fellow Lucianist." Lucian finally submitted to the authority of the church, and attained a higher reputation for learning and piety than ever. In the persecution under Maximin, having been arrested in Antioch, he was transported by land to Nicomedia, and put to the torture, soon after which he died in prison. He was the author of two short treatises on the Christian faith, and of some letters. All of the letters have perished, except one fragment, preserved in the "Alex-

andrian Chronicle." His greatest work was a revision of the Septuagint, which was generally used in the eastern churches.

**LUCIFER**, or **Phosphorus** (Lat. and Gr., the light bringer), the classic name of the planet Venus when it is the morning star, Vesper or Hesperus being its name when seen in the evening. In mythology Lucifer was the son of Astræus and Aurora, and together with the Hours had charge of the horses and chariot of the sun.—Lucifer is also one of the names of the devil. It occurs in the old versions in a passage of the prophecy of Isaiah (xiv. 12), in which the king of Babylon is compared with the morning star, and which has been understood by the church fathers in an allegorical sense, according to the usage which makes Babylon the embodiment of evil, and its fall the overthrow of sin. This use of the name has been confirmed in literature by the poet Milton, who adopts it in "Paradise Lost," making Lucifer the original name of the archangel who fell, carrying with him the third part of the host of heaven, and who is now called Satan.

**LUCIFER**, bishop of Cagliari, died about 370. In 354 he was sent by Liberius, bishop of Rome, as legate to the council of Milan, to uphold, in conjunction with Eusebius of Vercelli, the cause of the Catholic church against the Arian emperor Constantius. In consequence of the firmness with which he withstood the wishes of Constantius, he was arrested, and carried from place to place as an exile. While residing at Eleutheropolis in Palestine he composed his principal work, *Ad Constantium Augustum pro Sancto Athanasio*. On the death of Constantius Lucifer was restored to freedom, and commissioned by the council of Alexandria to aid in healing the disorders which afflicted the church of Antioch in consequence of the supposed Arianism of Meletius its bishop. His violence, however, only increased those disorders, and exposed him to the censure of his best friends. Chafing under the rebuke, and disgusted with the moderation of his party, he retired in 363 to his native island of Sardinia, and there founded a small sect, known as Luciferiani, whose most distinguishing characteristic was inveterate hostility to Arianism. The first edition of his works appeared at Paris in 1568; the best is that of the brothers Coleti (Venice, 1778).

**LUCILIUS, Caius**, a Latin poet, born in Suessa, a city of the Aurunci, in 148 B. C., died in Naples in 103. He served at a very early age under the younger Scipio in Spain, and is said to have been maternal grand-uncle of Pompey the Great. He was one of the fathers of Latin poetry, and, if not absolutely the inventor of Roman satire, he was at least the first to give it the form afterward fully developed by Horace, Persius, and Juvenal. The satires of Lucilius (as they are collectively called, though many of them appear not to have been of a satirical character) originally consisted of 30 books, of



which over 800 fragments are still extant, the greater number however consisting of single lines or isolated couplets, and the longest of them extending to only 13 verses. The fragments of Lucretius were originally collected by Robert and Henry Stephens, and published in the *Fragmenta Poetarum Veterum Latinorum* (Paris, 1564).

**LUCINA** (Gr. *Ειληθια*, Ilithyia), in ancient mythology, the goddess who was supposed to preside at the birth of children. According to the Hesiodic theogony, she was a daughter of Jupiter and a sister of Hebe and Mars, but in later times she was regarded as identical with Juno or Diana. Her principal places of worship were Rome, Crete, and Athens. On her festival, celebrated March 1, the matrons adorned her temples with flowers and prayed for fecundity, an easy delivery, and a fortunate posterity. Her worship was probably founded among the Dorians in Crete, and thence spread over Delos and Attica. Her birthplace, according to Cretan tradition, was a cave in the territory of Cnossus; others believed that she came from the Hyperboreans.

**LÜCKE, Gottfried Christian Friedrich**, a German theologian, born at Egeln, near Magdeburg, Aug. 23, 1792, died in Göttingen, Feb. 14, 1855. He studied at Halle and Göttingen, published *De Ecclesia Apostolica* (Göttingen, 1813), became in 1813 tutor in the theological faculty of Göttingen, and in 1816 went as *Privatdocent* to Berlin. In 1818 he accepted a call to the new university of Bonn; but in 1827 he returned to Göttingen as ordinary professor. His two most important works are *Grundriss einer neutestamentlichen Hermeneutik* (Göttingen, 1817), and *Commentar über die Schriften des Evangelisten Johannes* (4 vols., Bonn, 1820-'32; 3d ed., the last volume revised by Bertheau, 1842-'56). The latter work, in particular, is still classed among the best exegetical productions of German theology. In Berlin, he edited with Schleiermacher and De Wette the *Theologische Zeitschrift*; in Bonn, with Gieseler, the *Christliche Zeitschrift*. Afterward he was assistant editor of the *Studien und Kritiken*. His biographical essays on his teacher Planck (1835) and his friends Schleiermacher (1834) and De Wette (1850) are especially valued.

**LUCKENWALDE**, a town of Prussia, in the province of Brandenburg, on the left bank of the Nuthe, 30 m. S. by W. of Berlin; pop. in 1871, 13,527. It is on the railway from Berlin to Leipsic, and has numerous tanneries, breweries, distilleries, iron works, paper mills, dye houses, brick kilns, and manufactories of woollen and linen cloth. It has long been especially noted for its broadcloth. The town has increased rapidly of late.

**LÜCKNER, Nicholas**, a marshal of France, born at Kampen, Bavaria, in 1722, guillotined in Paris, Jan. 5, 1794. He was of a noble but poor family, and at an early age entered the Prussian service, in which he fought through

the seven years' war with distinction. He commanded a corps of light infantry at the battle of Rossbach. In 1763 he became a lieutenant general in the French army, but for many years saw no active service. He favored the revolution, was made a marshal in December, 1791, and in February, 1792, received command of the army of the north. He defended the frontier against the Austrians, and captured Courtrai and Menin, but soon evacuated them. In July he obtained the chief command of the three armies in the field, and on Aug. 19 fought a battle with the Austrians near Valenciennes. Soon after he fell under suspicion, was accused of conspiring with the enemy, and attempted to defend himself from the charge, but was arrested and speedily tried and condemned.

**LUCKNOW**, a city of India, capital of the province and former kingdom of Oude, situated on the S. bank of the river Goomtee, which is here navigable at all seasons, about 580 m. N. W. of Calcutta, 250 m. S. E. of Delhi, and 42 m. N. E. of Cawnpore; pop. in 1871, 284,799. The Goomtee is here crossed by three bridges, one of iron, one of stone, and one of boats. A distant view of the city, with its numerous turrets and pinnacles, conveys an impression of splendor surpassed by few Indian cities; but this is somewhat lessened by a closer inspection of its numerous narrow, filthy streets, and mean mud or bamboo houses thatched with straw. The streets are generally 10 or 12 ft. below the level of the shops on each side, but the English quarter is well built and adorned with gardens. In contrast with the dwellings of the native population, there are many public buildings of remarkable beauty. The Shah Nujeef, or Imambarra of the nabob-vizier Azof ud-Dowlah, is a fantastic brick structure, coated with white cement, and topped with several Moslem minarets and pointed Hindoo domes. It consists of a number of buildings surrounding two courts which are entered by magnificent gateways. The name Imambarra denotes a kind of edifice erected by Mohammedans of the Shiah sect for the celebration of the festival of the Mohurrum. Of five royal palaces in the city, the principal are the Fureed Buksh, a long range of buildings on the river bank, more remarkable for size than beauty, and the Kaiserbagh. The kings of Oude had also many fine country seats in the neighborhood, one of the most elegant of which is the Dilkoosha (Heart's Delight), about 2 m. toward the south. The Begum Kothee is a collection of palatial edifices formerly occupied by native princesses. "Constantia" is the name given to a curious mansion, loaded with incongruous ornaments, which was erected by the French adventurer Claude Martin, who went to India as a private soldier and rose to great power and opulence under the native government. A better monument to his memory is the Martinière, a college for half-caste children. An English church, an observatory, and a hospital and dispensary

are the other principal buildings. The church of England, the Methodist Episcopal church of the United States, and the Roman Catholic church have missions at Lucknow. The British residency was destroyed during the siege at the time of the mutiny of 1857. Since that event many changes have also been made in the plan of the city, as whole streets have been pulled down in accordance with the system of defence adopted by the British in 1858. Lucknow is connected with the East Indian railway, between Calcutta and Delhi, by the Oude and Rohilcund railway, a branch line to Cawnpore. —The seat of government of the former kingdom of Oude was removed from Fyzabad to Lucknow in 1775, and it continued to be the royal residence until the annexation of the territory to the British dominions. During the mutiny of 1857 the British garrison in Lucknow, numbering about 1,700 men, was besieged by about 10,000 of the mutineers. After 12

that number of troops; and on Feb. 21, with six guns and not quite 400 men, he routed another force of 20,000. In the mean time the insurgents had fortified Lucknow, and occupied it with a large force. Early in March they were besieged by Sir Colin Campbell, who effected a partial entrance on the 4th; but the capture was not complete until the 21st, when the city was abandoned by the enemy, most of whom made their escape.

**LUÇON**, a town of France, in the department of Vendée, on a navigable canal which connects it with the sea, about 55 m. S. S. E. of Nantes; pop. in 1866, 6,603. It is the seat of a bishop, and has a theological seminary and a communal college. There are manufactories of linen and china ware. In June, 1793, the republicans obtained here a victory over the Vendéans.

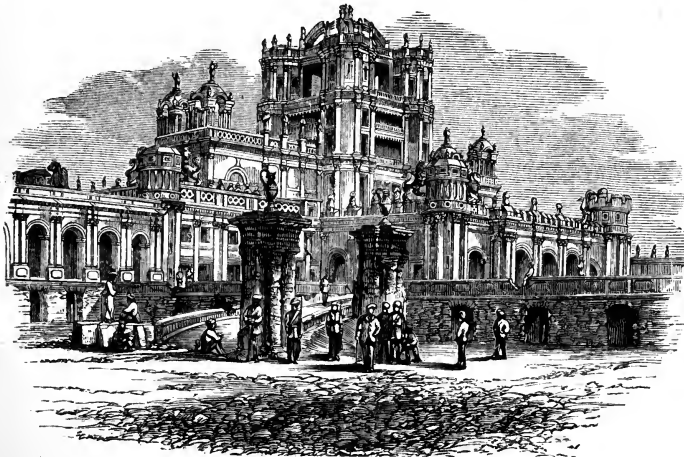
**LUÇON**. See LUZON.

**LUCRETIA**. See BRUTUS, LUCIUS JUNIUS.

**LUCRETIVS** (TITUS

LUCRETIVS CARUS), a Roman philosophical poet, concerning whose personal history little is known. According to the Eusebian chronicle, which is almost the sole authority, he was born in 95 B. C., was driven mad by a philter, composed in his intervals of reason several works which were revised by Cicero, and died by his own hand in 52. There are no other particulars concerning his life from authentic sources. He is known only as the author of *De Rerum Natura*, which is by universal consent the

greatest of didactic poems. It is in six books, in heroic verse, extends to 7,400 lines, and is addressed to C. Memmius Gemellus, prætor in 58 B. C. It is designed to develop clearly and to illustrate in an attractive way the atomic theory of the universe; to show that there is nothing in the history or condition of the world which requires the creative agency of a supreme power, but that all objects may be formed by the union of elemental particles governed from all eternity by certain laws. The first book contains a magnificent apostrophe to Venus, as the allegorical representation of the reproductive power, an invective against the monster superstition, an elucidation of the formula that nothing can be produced from nothing, and a statement of the doctrine of ultimate atoms. The development of the atomic theory occupies the second book. The third book aims to prove that soul and body are one and indistinguishable, and live



The Martinière, Lucknow.

weeks' defence, during which the British lost Sir Henry Lawrence, their commander, and suffered from the ravages of cholera, smallpox, and fevers, scarcely less than from the fire and assaults of the enemy, Gens. Havelock and Outram fought their way in with a relieving force, Sept. 25. The defence was now resumed with fresh vigor, Sir James Outram, as senior officer, taking the command. On Nov. 17 Sir Colin Campbell reached the city with reënforcements. A few days later the residency was evacuated, the British withdrawing by night to the Dilkoosha, where on the 25th Sir Henry Havelock died of dysentery. Gen. Outram was left with a division at the Alum-bagh (the king's summer palace, about 4 m. from the residency) to watch the enemy, and the rest retired in safety to Cawnpore. In January, 1858, Outram was subjected to desperate attacks at the Alum-bagh by 30,000 rebels, whom he defeated with about one tenth

and perish together, and closes with a fine exposition of the folly of fearing death, which is to extinguish feeling for ever. The fourth treats of the senses, of sleep, dreams, and love. The fifth and most impressive book discusses the origin of the world, the movements of the heavens, the changes of the seasons, and the progress of man, society, institutions, inventions, and sciences. The sixth book explains extraordinary natural phenomena, as thunder, lightning, storms, earthquakes, and volcanoes. Throughout the work the most abstruse speculations are clearly rendered, and the dryness of the subject and the inherent weakness of the views are relieved by the sublimity of the poetry and by digressions of remarkable power and beauty. The best editions are those of Havercamp (2 vols. 4to, Leyden, 1725), Forbiger (Leipsic, 1828), and Munro, with notes and translations (2 vols. 8vo, 3d ed., London, 1873). There are complete English translations in verse by John Mason Good (1805) and Thomas Busby (1813), and in prose by the Rev. J. S. Watson (1851), which forms with the version of Good one volume of "Bohn's Classical Library," and C. F. Johnson (New York, 1872).

**LUCULLUS, Lucius Licinius**, a Roman general, born about 109 B. C., died about 57. His first appearance in public life was as the accuser of the augur Servilius, who had procured the banishment of his father. This prosecution, though unsuccessful, and leading to scenes of violence and blood, was yet deemed highly creditable to the young Lucullus. He served in the social war, and afterward accompanied Sulla to Greece and Asia as quaestor, on the outbreak of the first Mithridatic war in 88. During the siege of Athens, Lucullus, in obedience to the orders of Sulla, collected a naval force from the allies of Rome, with which he defeated the fleet of Mithridates off the coast of Tenedos. After the conclusion of peace with the king of Pontus he was appointed to collect from the cities of Asia the tribute which Sulla had imposed on them as a punishment for their recent revolt. In the discharge of this duty Lucullus displayed the utmost humanity and kindness. In 80 he returned to Rome to fill the office of curule aedile, to which he had been elected in his absence, together with his younger brother Marcus. The games exhibited by the Luculli during their aedileship were remarkable for their magnificence, and for being the first at which combats of elephants and bulls were introduced. The elder brother was so highly esteemed by Sulla that the ex-dictator confided to him the revision and correction of his Commentaries, appointed him guardian of his son Faustus, and caused a special law to be passed to enable him to hold the praetorship immediately after he had been aedile. In 74 he was consul with M. Aurelius Cotta, and having been appointed to conduct the second war against Mithridates, he carried it on for eight years with almost invariable success; defeated the king and his generals both by sea and land,

and compelled him to seek an asylum at the court of Tigranes, king of Armenia; invaded the latter kingdom, vanquished its sovereign, and captured his capital; and was only prevented from consummating the overthrow of his formidable antagonist, and bringing the war to a triumphant conclusion, by the insubordination of his own soldiers. He also devoted much of his attention to the condition of the provinces, which were suffering under the oppressions of the Roman revenue officers, who thus became his enemies. At length the Manilian law was enacted, which deprived Lucullus of his command, and gave it to his rival Pompey. He returned to Rome, and for the rest of his life took hardly any part in public affairs, but spent most of his time at his rural villas, in the enjoyment of a princely fortune, and in conversation with philosophers and literati. He collected a valuable library, which was open to all, and wrote a history of the social war in Greek, which is lost. His gardens near Rome were laid out in a style of extraordinary splendor, and his horticultural works in the neighborhood of Neapolis were on so gigantic a scale that Pompey called him in derision "the Roman Xerxes." He spared no expense in the entertainment of his friends, and a single supper which he gave some of them is said to have cost him 50,000 denarii, or about \$8,500. He first introduced cherries into Europe, the tree receiving its Latin name from Cerasus, a town of Pontus.

**LUDEM, Heinrich**, a German historian, born at Loxstedt, near Bremen, April 10, 1780, died in Jena, May 23, 1847. He studied theology, history, and philosophy at Göttingen. In 1806 he became extraordinary, and in 1810 ordinary professor at Jena. When a considerable part of Germany was under the rule of the French, Luden was among the first and most influential writers who stirred up the patriotic sentiments of the Germans. His historical publications are very numerous, including, besides biographies of Thomasius (Berlin, 1805), Hugo Grotius (1806), and Sir William Temple (Göttingen, 1808), *Allgemeine Geschichte der Völker und Staaten des Alterthums* (Jena, 1814); *Allgemeine Geschichte der Völker und Staaten des Mittelalters* (2d ed., 1824); *Die Geschichte des deutschen Volkes* (12 vols., Göttingen, 1825-'37), which reaches only to 1237; and others. For four years (1814-'18) he was the editor of the *Nemesis*, a journal devoted to politics and history, published at Weimar. A posthumous work, *Rückblicke in mein Leben* (Jena, 1847), contains many valuable notices of persons and events of his times.

**LÜDERS, Alexander Nikolajevitch**, a Russian general, born in 1790, of a German family long settled in Russia, died in St. Petersburg in February, 1874. He entered the army in 1807, was engaged in the war in Finland in 1808, and took part in the campaigns against Napoleon from 1812 to 1814. In 1831 he led a brigade in Poland, and distinguished himself at the taking

of Warsaw. In 1838 he took the place of Muravieff at the head of the 5th corps of infantry. He served in the Caucasus from 1843 to 1845, and after a long furlough, rendered necessary by ill health, he was sent to the Danubian principalities in July, 1848. In 1849 he entered Transylvania under the convention between the emperors of Austria and Russia with 40,000 men. After capturing Kronstadt and Hermannstadt, he twice defeated Bem, and then marching into Hungary proper, was present at the surrender of Görgey. In 1853, when the Crimean war began, Lüders, under command of Gortchakoff, was placed on the Danube, and made a difficult march toward Silistria, but was compelled by sickness to leave the army. When restored to health in March, 1855, he took command of the army of the south, establishing his headquarters first at Odessa, then at Nikolayev. In January, 1856, the emperor Alexander gave him the superior command in the Crimea, and he was engaged in preparation to carry on the war with the allies when it was ended by the treaty of Paris (March 30), and Lüders retired from the army. In 1861 he was lieutenant general of Poland, and was made count in 1862, in reward for his services in suppressing the disturbances in Warsaw. In June, 1862, an attempt was made to assassinate him, and he received a severe wound, after which he retired from service.

**LUDINGTON**, a city of Mason co., Michigan, on Lake Michigan, at the mouth of Père Marquette river, 125 m. N. W. of Lansing; pop. in 1874, about 2,500. The Flint and Père Marquette railroad, completed to Reed City, 50 m. E., is to terminate at this point. The city has a considerable trade in lumber, shingles, wooden bowls, and tan bark, and contains about 25 stores, seven saw mills, a shingle mill, a planing mill, a foundery and machine shop, two banks, three hotels, a large school house, and a weekly newspaper. It was laid out in September, 1867.

**LUDLOW**, a parliamentary borough of Shropshire, England, on the Teme, 23 m. S. of Shrewsbury; pop. in 1871, 6,203. It has a cruciform parish church, a free grammar school founded in the reign of Edward VI., a small theatre, and a library. Ludlow is one of the small boroughs which until recently retained the right of sending two members to the house of commons, but which now return only one.

**LUDLOW**, Edmund, an English republican, born at Maiden-Bradley, Wiltshire, in 1620, died in Vevay, Switzerland, in 1693. His father, Sir Henry Ludlow, was an extensive land owner in Wiltshire, and one of its representatives in the long parliament, where he was a strenuous opponent of the crown. Edmund was educated at Trinity college, Oxford, and on the outbreak of the civil war joined the army of Lord Essex as a volunteer, and was present at the battle of Edgehill. After the death of his father he was returned to parliament for Wiltshire, and obtained the command

of a regiment of cavalry. From this period he became prominent as a popular leader, and filled various important civil and military offices. He was a thorough republican, and steadily advocated the establishment of a commonwealth. He was one of the most inflexible of the king's judges, and an ardent supporter of the bill for the abolition of the house of peers. His sturdy independence rendering him obnoxious to Cromwell, he was removed out of the way by being appointed to a high military command in Ireland in 1650. When Cromwell assumed the protectorate, Ludlow entered his solemn protest against the act, and on returning to England refused to recognize the protector's authority. Hence he was regarded with distrust, and retired into Essex, where he remained till Cromwell's death. Resuming his public career, he took an active part in the political proceedings of the day, laboring to effect the restoration of the commonwealth; but, deeming the return of the Stuarts inevitable, he withdrew from London, and soon afterward went to Switzerland. He returned to England at the revolution of 1688; but being threatened with arrest, he betook himself again to Switzerland, where he passed the rest of his life, engaged in the composition of his "Memoirs." They were published at Vevay (3 vols. 8vo, 1698-'9), and have since gone through various editions. Over the entrance of his villa at Vevay, Ludlow placed the inscription: *Omne solum forti patria*.

**LUDOLPHUS**, or **Ludolf, Job**, a German orientalist, born in Erfurt, June 15, 1624, died in Frankfurt, April 8, 1704. He was educated at the university of Leyden, and in 1649 visited Rome, and perfected himself in the knowledge of Ethiopic by conversation with certain Abyssinians who were then sojourning in that city. He afterward filled various official posts, and in 1690 he was made president of the academy of history at Frankfurt, where his latter years were spent. He was the author of many works, relating especially to Ethiopia and its language.

**LUDWIG, Karl Friedrich Wilhelm**, a German physiologist, born at Witzenhausen, Hesse-Cassel, Dec. 29, 1816. He studied at Marburg and Erlangen, and was professor at the Marburg university till 1849, at Zürich 1849-'55, at Vienna 1855-'65, and subsequently at Leipsic. The originality and logical force of his investigations relating to anatomical physiology have placed him in the front rank of that science. His principal works are *Lehrbuch der Physiologie des Menschen* (2 vols., Heidelberg, 1852-'6), and *Arbeiten aus der physiologischen Anstalt zu Leipzig* (Leipsic, 1866 et seq.).

**LUDWIG, Otto**, a German poet, born at Eislefeld, Saxe-Meiningen, Feb. 11, 1813, died in Dresden, Feb. 25, 1865. He studied music in Leipsic under Mendelssohn, but ill health preventing him from pursuing that profession, he engaged in literary pursuits. His principal works are the tragedies *Der Erbforster* (Leipsic, 1853),

*Die Makkabäer* (1855), *Agnes Bernauer* (1857); the tales *Zwischen Himmel und Erde* (Frankfort, 1856), and *Thüringer Naturen* (1857); and the posthumous works *Reden oder Schweigen*, *Der Todte von St. Anna's Kapelle* (Berlin, 1871), and *Shakespeare-Studien*, the latter edited by Heyderich (Leipzig, 1871).

**LUDWIGSBURG**, a town of Württemberg, 8 m. N. of Stuttgart; pop. in 1871, 11,785. It is the second residence of the king of Württemberg, and its vast palace, one of the largest in Germany, has a fine collection of paintings and spacious gardens. It has several churches, a lyceum, a military school, an eye infirmary, a famous Protestant educational institution (the *Salon*), an arsenal, and a cannon foundry. The principal manufactures are woollens, cotton, linen, earthenware, leather, jewelry, and organs. David Strauss was born and died here.

**LUDWIG'S CANAL**. See CANAL, vol. iii., p. 684.

**LUDWIGSHAFEN**, a town of Bavaria, in the Palatinate, opposite Mannheim, on the left bank of the Rhine, which is here crossed by an iron railway bridge; pop. in 1871, 7,874. It was formerly called the *Rheinschanze* (redoubt of the Rhine), and serves as bridge head to Mannheim. It received its present name from King Louis I. in April, 1843, since which time, owing to the active trade, especially with Paris, Frankfort, and Mentz, the population has rapidly increased.

**LUGANO**, a town of Switzerland, alternately with Locarno and Bellinzona capital of the canton of Ticino, on Lake Lugano, 38 m. N. N. W. of Milan; pop. in 1870, 6,024. The church of Sta. Maria degli Angioli contains a famous fresco painting of Bernardino Luini. The town has also a large theatre, manufactories of silks, leather, and iron ware, and is an important entrepot of trade between Italy and France.—The lake of Lugano, which has a length of about 20 m. and an average breadth of 2 m., has magnificent scenery, and is connected by the river Tresa with the Lago Maggiore. Its shape is very irregular. The N. E. portion of it belongs to Italy, as well as the terminations of its W. and S. arms.

**LUGANSKI, Kosak**. See DAHL, VLADIMIR IVANOVITCH.

**LUGO**. I. A N. W. province of Spain, in Galicia, bordering on the bay of Biscay and the provinces of Asturias, Leon, Orense, Pontevedra, and Corunna; area, 3,787 sq. m.; pop. in 1870, 475,836. It is very mountainous, and but a small portion of the surface can be cultivated. The principal rivers are the Minho, Sil, and Eo. The coast is very rugged, with high cliffs and but small harbors. Cape Estaca is the most northerly point of Spain. The mountains are pretty well wooded near the base, and their slopes afford considerable fine pasturage. The inhabitants are mainly cattle-raisers, muleteers, and fishermen. Agriculture is in a primitive condition, a large part of the work being done by women, and education is very much neglected. The min-

eral productions are iron, antimony, lead, granite, and marble. Among the more important towns are Mondoñedo and Rivero. II. A city (anc. *Lucus Augusti*), capital of the province, on the left bank of the Minho, 48 m. S. E. of Corunna, with which it is connected by railway; pop. about 21,000. The town is nearly square, and is surrounded by massive walls with projecting towers, the top of which forms a favorite public walk. It is the seat of a bishop, and has a cathedral which dates from 1129, the only one in Spain that enjoys the privilege of having the sacred host continually exposed night and day. The streets are regularly laid out, and are wide, clean, and paved. There are a dozen squares, two parish churches, two convents, two hospitals, a prison, a theatre, barracks, and sulphur baths. The episcopal palace contains a large library. The manufactures include woollen and linen fabrics, especially hosiery, leather, hats, soap, candles, wine, and oil; and fine books, mainly of local interest, are published here. In the 5th century Lugo was the capital of the kings of the Suevi. A part of the city wall is of Roman origin, and in 1842 a curious Roman mosaic pavement was discovered here.

**LUGOS**, a town of S. Hungary, capital of the county of Krassó, 34 m. E. by S. of Temesvár; pop. in 1870, 11,654. It is traversed by the river Temes, separating the German from the Rouman or Wallach town, which contains nearly three fourths of the population. The surrounding district is rich in wine, which constitutes the principal article of commerce. The town is the seat of a Greek bishop, and contains a gymnasium, a convent, and military barracks. It was once a flourishing city and strong fortress, but was devastated by the Turks, who gained here a victory over the Austrians in 1695. It was the last place of refuge for the Hungarian army and government during the war of 1849.

**LUIGI, Andrea di**, called also L'INGEGNO and ANDREA DI ASSISI, an Italian painter, born in Assisi about the middle of the 15th century, died subsequent to 1511. Vasari says that he was an artist of great genius, the rival and fellow pupil of Raphael, and that in the bloom of youth and the maturity of his powers he was suddenly afflicted with total blindness while assisting his master Perugino in painting his frescoes in the Sistine chapel; whereupon he was pensioned by Sixtus IV. Rumohr in his *Italienische Forschungen* has satisfactorily proved the whole story to be a fiction, and has assigned to Luigi a much lower place as an artist than he has hitherto held.

**LUINI**, or **Lovini, Bernardino**, an Italian painter, born at Luino, on the Lago Maggiore, in the latter half of the 15th century, died subsequent to 1530. He is supposed to have been a scholar of Leonardo da Vinci from the closeness with which he imitated his style. The best judges are frequently at a loss to discriminate between the two, and out of Italy Luini's



pictures are almost invariably ascribed to Leonardo. The "Christ Disputing with the Doctors," in the British national gallery, formerly attributed to Leonardo, is now supposed to be the work of Luini. His best pictures in oil and fresco are in Milan, Lugano, and Saronno, including his "Magdalen," "St. John with the Lamb," and "The Enthroned Madonna." In elaborate finish, beauty of color, and expression, they are hardly inferior to the works of Leonardo. His frescoes are among the finest early specimens of the arts. Of these "The Crucifixion" and "The Madonna" are in the church of Sta. Maria degli Angioli at Lugano. His two sons, Aurelio and Evangelista, assisted him occasionally in his frescoes.

**LUITPRAND**, or **Luitprand**, king of Lombardy, born about 690, died in January, 744. He aided in the defeat of the usurper Aribert II. in 712 by his father Ansprand, and the latter dying after a reign of three months, Luitprand was unanimously elected king. The wise laws which he enacted from 712 to 724 remained in force in northern Italy till the 18th century, and in the kingdom of Naples till the 16th. His desire of driving the Greeks out of Italy involved him in quarrels with successive popes, who dreaded the increase of the Lombard power as much as they hated the yoke of the Byzantine emperors. In 728, while Pope Gregory II. resisted the authority of the emperor Leo the Isaurian, Luitprand, declaring himself opposed to the iconoclasts, wrested from the Greeks the exarchate of Ravenna and all the provinces north of Rome. Gregory, alarmed at these successes, persuaded the Venetians in 729 to expel the Lombards from the exarchate, and incited Spoleto and Benevento to revolt. These territories, however, were soon reconquered by Luitprand, who then advanced toward Rome. The city was saved by the pope, and peace was restored momentarily. In 736 a dangerous illness forced Luitprand to give up the administration to his nephew Hildebrand, who was elected to succeed him; but having recovered, he continued to govern conjointly with him. In 739 he went with an army to the succor of Charles Martel in France, and drove the Saracens out of Provence. On his return to Italy he once more attacked the Greeks, who were leagued against him with Pope Gregory III. Luitprand having laid siege to Rome with his victorious army, the pope offered the protectorate of that city to Charles Martel, at whose instance Luitprand raised the siege. With Pope Zachary, Gregory's successor, Luitprand maintained more friendly relations, restored the provinces taken by the Lombards, and made peace with the Greeks. He left Lombardy powerful and prosperous, and was succeeded by Hildebrand.

**LUITPRAND**, or **Luitprand**, a Lombard historian, born probably in Pavia about 920, died in Cremona in the beginning of 972. He was a deacon of the cathedral of Pavia, and afterward chancellor of Berenger II., who sent him

as ambassador to Constantinople. Having incurred the resentment of Berenger and his queen in 950, he fled to the court of the emperor Otho I. In 958 he began to write the history of contemporary events, which he continued till 961, when he rejoined Otho in Italy, who appointed him bishop of Cremona and sent him to Rome. He was present in the council which judged Pope John XII. and controlled the election of the antipope Leo VIII. He was sent again as ambassador to Constantinople in 968 and 971. His works are of great historical interest, being lively and minute pictures of contemporary events and personages; but they betray personal passions, and are full of chronological errors. They are: *Historia Ottonis*, or *Liber de Rebus Gestis Ottonis Magni Imperatoris*, a chronicle of events from 960 to 964; *Relatio de Legatione Constantinopolitana* (of 968); and *Antapodosis*, his longest work, in six books, embracing the general history of Europe from about 888 to 948. The best editions are in the third volume of Pertz's *Monumenta Germanie Historica* (Hanover, 1839), and that of Antwerp (fol., 1640). The *Antapodosis* was translated into German by Baron von Osten-Sacken (Berlin, 1853). See also Köpke *De Vita et Scriptis Luitprandi* (1842); and Wattenback, *Deutschlands Geschichtsquellen im Mittelalter* (2d ed., 1866).

**LUKE**, **Saint**, the evangelist, the author of the third Gospel, and, according to ecclesiastical tradition, also of the Acts of the Apostles. The name is now generally regarded as an abbreviation of Lucanus. It appears only three times in the New Testament. If these passages refer to the author of the Gospel, he was a physician and a collaborator of St. Paul. If Luke was also the author of the Acts, he was in A. D. 52 with Paul in Troas, and accompanied him thence as far as Philippi. He followed Paul on his third missionary tour through Macedonia, and by way of Troas, Miletus, Tyre, and Cæsarea, to Jerusalem, and was with him again when Paul was sent as a prisoner to Rome. This is all that is recorded of him in the New Testament, and even Irenæus knew nothing that could be added to it. Many more statements concerning his person are found in the ecclesiastical writers of later centuries. According to Eusebius and others, he was a native of Antioch. Epiphanius says that he was one of the 70 disciples, and one of the two disciples who went to Emmaus, and that he labored in Dalmatia, Italy, Macedonia, and especially in Gaul. Eucumenius says he went to Africa. The legend that he was a painter is first alluded to by Nicephorus. Constantinople, Patræ in Achaia, and several other towns are mentioned as the place where he died. Jerome ascribes to him an age of 84 years. The Roman Catholic church celebrates his festival on Oct. 18. The silence of the apostolic fathers concerning the Gospel of Luke indicates that it was admitted into the canon somewhat late. The first church writers who quote it are Jus-

tin Martyr and the author of the Clementine Homilies. Irenæus mentions that Luke wrote down the Gospel proclaimed by Paul; and all admit that at the time of Irenæus and Tertullian his Gospel was accepted throughout the whole church in its present form. A statement of Tertullian, that Marcion so changed a copy of the Gospel of Luke as to make it conform to his own views, has called forth in modern times a number of investigations of the relation of Luke's Gospel, as we have it in the New Testament, to that of Marcion. Ritschl (*Das Evangelium Marcions*), Baur (*Die kanonischen Evangelien*), and others endeavored to prove that the Gospel of Luke as we have it is interpolated, and that the portions which Marcion is charged with having omitted were really unauthorized additions to the original document; but Volckmar, in his exhaustive treatise *Das Evangelium Marcions* (Leipsic, 1852), so completely demolished this theory that Ritschl abandoned his position, and Baur greatly modified his. The statement in the first verse of the Gospel of Luke, that "many" before him "have taken in hand to set forth a declaration of those things which, are most surely believed among us," has been understood by several interpreters as intimating an acquaintance with the Gospels of Matthew and Mark on the part of Luke, while others refer the expression "many" to other writers. As the occasion for writing his Gospel, the author himself mentions (i. 3, 4) his desire to give to his friend Theophilus a faithful narrative of the life of Christ. With regard to the time of its composition, the prevailing opinion before De Wette and Credner was, that it was written previous to the destruction of Jerusalem; but more recently the opinion that it was composed after that event has found advocates in different theological parties. According to Volckmar, *Die Evangelien* (Leipsic, 1870), the book was written about the year 100 by another author than the Pauline Luke. Achaia, Bœotia, and Alexandria are mentioned by the ancients, and Cæsarea and Rome are suggested by modern writers, as the place where the Gospel was composed. The Acts are likewise addressed to Theophilus. (See Acts.) Valuable commentaries on both the Gospel and Acts are contained in the collective works of Olshausen, De Wette, Meyer, and Lange. Among the latest commentaries upon the Gospel are those of Goodwin (London, 1865), Stark (London, 1866), and Godet (Neuchâtel, 1870). Some other works, which have been sometimes ascribed to Luke in the ancient church, as *Acta Pauli*, *Liturgia XII. Apostolorum*, were long ago acknowledged to be spurious.—See Schleiermacher, *Die Schriften des Lucas* (Berlin, 1817).

LULLY, or LULLI, Jean Baptiste, a French composer, born in Florence in 1633, died in Paris, March 22, 1687. He was of obscure parentage, but having at the age of 10 attracted the attention of the chevalier de Guise, he was taken by

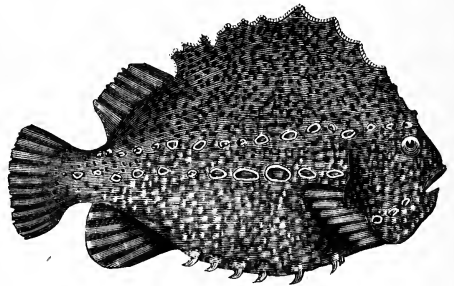
him to Paris as a page for Mlle. Montpensier, the cousin of Louis XIV. His appearance not pleasing his mistress, he was placed in the kitchen as a scullion. He possessed a strong taste for music, however, and practised on an old violin until he had become a tolerably skilful performer. The princess, hearing of his proficiency, had him instructed under an able master, and in a few months he was admitted into the king's *bande des vingt-quatre*, so called from the number of the instruments, which were all violins. He was afterward placed at the head of a new band of 16 violins, called *les petits violons*, which soon eclipsed the famous twenty-four. To the impulse given by this nucleus of performers French musicians trace their present orchestral proficiency. Lully, continuing to rise in favor with the king, became director of music at the court, and for many years composed airs and accompaniments for the court ballets, a species of dramatic entertainment antedating the opera, and consisting of dances interspersed with singing and recitative. He also furnished music for many of Molière's comedies, in some of which, such as the *Bourgeois gentilhomme*, he performed with great success. Having obtained in 1672 a patent for opening a theatre for the performance of lyrical pieces, in conjunction with the poet Quinault he devoted himself thenceforth to the composition of operas. His works of this class number 19, and were highly popular with the king and the court. In the height of his reputation Lully met with his death in a singular manner. While conducting the performance of a *Te Deum*, composed by himself in honor of the king's recovery from sickness, he accidentally struck his foot violently with the cane with which he was beating time. Inflammation having set in, he put himself under the care of a quack, whose treatment he did not long survive.—Lully is generally regarded as the father of French dramatic music. He may be said to have created orchestral music in France by the new combinations of sound and the fuller harmonies he introduced into instrumental composition, as well as by the exactness of execution which he demanded from the performers. His reputation rests chiefly upon his operas, which are animated by a fine dramatic spirit, and frequently show beauty and pathos in the melodies, although the harmonies would contrast but indifferently with the works of modern composers. He is entitled to the credit of having invented the overture, and that spirited movement, the *largo*, which is the general introduction to the fugue. Handel has acknowledged that he modelled his overtures from those of Lully, and Purcell derived many valuable hints from his works. Most of Lully's biographers describe him as irritable and insolent to his inferiors, jealous of his compeers, selfish, and addicted to gross pleasures. His avarice gained him the name of Lully *le ladre*, and to the predominance of this trait has been ascribed his quarrel with Molière and La Fon-

taine. He left a fortune of 600,000 livres, the savings of a life of unusual prosperity.

**LULLY, Raymond** (RAMUNDO LULLIO), a Spanish philosopher, surnamed "the enlightened doctor," born in Palma on the island of Majorca about 1235, killed at Bougiah in Algeria in 1315. He was the son of a Barcelonese nobleman in the service of the king of Aragon, and was trained to the profession of arms. After a career of scandalous excesses, at the age of 30 he suddenly renounced the world and its pleasures, divided his property among his family and friends, and, assuming the habit of a Franciscan monk, retired into a solitary place for the purpose of preparing himself for the labors and duties of a missionary, to which, he said, Christ had summoned him in a vision. Here he studied philosophy, theology, ancient languages, the philosophical works of Averroes and other Moorish writers, and invented a system of dialectics by which he hoped to reform science and convert Mohammedans, Jews, and pagans to Christianity. Inspired, as he said, by another vision, he published in 1276 his *Ars Magna*, in which his system is unfolded at length, and immediately went in search of patrons and proselytes. The remainder of his life was one long and toilsome pilgrimage. He visited many of the principal cities of Europe, sometimes endeavoring to establish institutions to teach his doctrines, and sometimes attempting to incite a general crusade against the Moslems. He twice visited northern Africa and disputed with the Mohammedan doctors, and was driven from the country. While making a third attempt, he was stoned to death at Bougiah in his 80th year. The body of the aged martyr, whom his countrymen deemed worthy of canonization, was brought to his native place for burial. His principal works are the *Ars Magna*, or, as it is usually termed, the *Ars Lulliana*, and the *Arbor Scientiæ*. The former is a kind of logical machine for combining certain classes of ideas, and thereby solving scientific questions. By means of letters, figures of squares, triangles, and circles, and of sections (*camera*), an indefinite number of formulas is obtained, serving as keys to metaphysical problems. The *Arbor Scientiæ* is a kind of encyclopædia, containing the application of his method to all sciences. It is impossible to enumerate all his works, but they are said to have been more than one man could transcribe in the course of an ordinary life. He has been variously regarded as a sainted martyr and champion of the church, a heretic, a philosopher surpassing Aristotle, or a shallow empiric. He had more erudition than judgment, and his system of metaphysics was so interwoven with mystical fancies, that the apparent regularity of his formulas ill conceals the incoherency of his ideas. He wrote in a barbarous style, which repels the reader. An edition of his works in 10 volumes, edited by Salzinger, was published at Mentz in 1721-'42.

**LUMBAGO.** See RHEUMATISM.

**LUMP FISH,** or **Lump Sucker,** a name given to several spiny-rayed fishes of the family *discoboli*. The position of this family has been the subject of considerable difference of opinion among naturalists. Swainson placed them in the order *apodes* with the eels and lampreys; Cuvier ranked them among malacopterygians with the cod and sole; J. Müller properly restored them to the acanthopterygians, but, from the union of their ventrals into a disk, established for them, with the gobioids, the family *cyclopodii*, separating *electris*. Agassiz places the *discoboli* with the mailed-cheeked fishes, in the neighborhood of the sculpins, separating them entirely from the gobioids. The best known genera of the lump fishes (*discoboli* and *gobiesocida* of ichthyologists) are *cyclopterus* (Linn.), *liparis* (Artedi), *lepidogaster* (Gouan), and *gobiesox* (Lacép.).—In the genus *cyclopterus* the body is thick and high, without scales, covered with a mucous skin with a few osseous points over its surface; the teeth are small and sharp, on the jaws and pharyngeals; the mouth large; gill covers



Lump Fish (*Cyclopterus lumpus*).

small, and their openings closed below; branchiostegous rays six; the pectorals very large, extending under the throat, and embracing the concave disk formed by the united ventrals, by means of which they adhere to rocks and other objects; the skeleton is mostly cartilaginous; the stomach large with numerous pyloric appendages, the intestine long, and the air bladder moderate. The common lump fish (*C. lumpus*, Linn.), found on both sides of the Atlantic, varies from 8 to 20 in. in length, and may attain a weight of 18 lbs.; its appearance is grotesque and forbidding, its form being clumsy, its skin slimy, its flesh flabby, and its fins comparatively small. The first dorsal fin is rather a fleshy ridge just behind the head, with simple rays; the second dorsal, with branching rays, is about opposite the anal; besides the scattered tubercles, there are three distinct rows proceeding backward respectively from the eye, posterior angle of operculum, and ventral disk. The color is bluish slate above with blackish spots, and yellowish below. It is common from the shores of Scotland to the coast of Greenland; notwithstanding its unwhole-

some look, its flesh is esteemed as food by the northern Europeans. It is not uncommonly thrown up on our beaches during storms, and is occasionally caught by the hook when fishing for cod, but it is not eaten in this country. By means of the ventral disk it can attach itself very firmly to objects; it is voracious, feeding principally on young fish; it spawns about May, just before which the colors are brilliant, with tints of blue, purple, and orange. Several other species occur in the vicinity of Greenland, described by Richardson in the *Fauna Boreali-Americana*.—The genus *liparis* differs from the preceding in having a more elongated body, compressed posteriorly, and a single long dorsal with a corresponding anal fin. The unctuous lump fish, or sea snail (*L. communis*, Art.), from 6 to 18 in. long, brownish above with darker stripes, and yellowish white below, is often caught on the shores of Scotland, where it adheres to stones in the small pools left by the receding tide; it feeds on aquatic insects, mollusks, and small fishes; it occurs also on the coasts of Greenland, where other species are found.—In the genus *lepidogaster* the pectorals are very large, descending below the throat, supported by four firm rays at the lower part on each side, and united around an oval disk in front of the concave disk formed by the ventrals; there are apparently two pairs of pectorals and two pairs of ventrals, but one pair of each are mere folds of skin and not true fins; the membranous fold of the second pectorals contains fibrous rays, and is attached to the shoulder bone, and the membranous ventral fold to the styloid or pubic bone, which structural peculiarities, in the opinion of Agassiz, render necessary the separation of this genus and its allies into a distinct family. The body of the Cornish lump sucker (*L. Gouani*, Lacép.) is smooth, with a single dorsal fin opposite the anal and near the caudal; branchiostegal rays five; no pyloric appendages; the length is only three or four inches, and the general tint pale flesh color, with carmine spots and patches. There are other species, all remarkable for their powers of adhesion, which enable them to resist strong currents and the action of the waves, and possibly to attach themselves to various objects, or even to fish, for purposes of locomotion, like the remora or sucking fish; they are sluggish in their habits, and delight to hide beneath stones near low-water mark; their food consists of crustaceans and marine worms, which they swallow entire; they are very tenacious of life; on account of the small openings from the gills, they have no air bladder. An allied genus is *gobiesox*, in which the pectorals and ventrals form only one disk; the dorsal and anal are short, and separated from the caudal. The toothed lump fish (*G. dentex*, Lacép.), from the Cape of Good Hope, may be known by the strong teeth in the front of the jaws; it is scarlet-colored, and several inches long.—Other genera are mentioned by Müller and Agassiz.

**LUMPKIN**, a N. county of Georgia, drained by Chestatee river and its branches; area, about 400 sq. m.; pop. in 1870, 5,161, of whom 462 were colored. A range of the Blue Ridge crosses its N. border. The surface is generally hilly, and the soil near the rivers highly productive. It contains several gold mines, which are the richest in the Atlantic region, and copper, silver, magnetic iron, and lead are also found. The chief productions in 1870 were 8,911 bushels of wheat, 82,013 of Indian corn, 8,828 of oats, 7,620 of sweet potatoes, 12,297 lbs. of tobacco, and 39,072 of butter. There were 325 horses, 831 milch cows, 1,423 other cattle, 2,383 sheep, 5,293 swine; 1 flour mill and 3 quartz mills. Capital, Dahlonega.

**LUMPKIN. I. Wilson**, an American statesman, born in Pittsylvania co., Va., Jan. 14, 1783, died in Athens, Ga., in 1871. Early in 1784 his father removed to that part of Georgia now known as Oglethorpe county, and in 1797 was appointed clerk of the superior court there, and the son became an assistant in his office, and devoted his leisure to the study of law. He had scarcely reached the age of 21 when he was elected to the legislature, and he was subsequently reelected a number of times. He was twice elected governor of the state, in 1831 and 1833. In 1823 he was appointed by President Monroe to mark out the boundary line between Georgia and Florida; and by President Jackson he was appointed one of the first commissioners under the Cherokee treaty of 1835. He was one of the original members of the board of public works, created by the state legislature. He served in the United States house of representatives from 1815 to 1817, and from 1827 to 1831, and in the senate from 1838 to 1841. **II. Joseph Henry**, an American lawyer and jurist, brother of the preceding, born in Oglethorpe co., Ga., Dec. 23, 1799, died in Athens, Ga., June 4, 1867. At an early age he entered the university of Georgia, but afterward went to Princeton, N. J., where he graduated. In 1820 he was admitted to the bar, and commenced practice at Lexington in his native county, where he soon gained eminence in the profession. In 1844 he retired from the bar on account of ill health, and shortly afterward visited Europe. In 1845 he was elected a justice of the state supreme court, afterward became chief justice, and held that office until his death. As a judge he held a high position. At the bar he was chiefly distinguished as an advocate in criminal causes, and his extraordinary appeals to the sympathy of jurors were long the subject of conversation among those who had opportunities of hearing him. He was a prominent advocate of the temperance cause. In 1846 he was elected to the chair of rhetoric and oratory in the university of Georgia, which he declined. At the time of his death he held the chief professorship in the Lumpkin law school at Athens, in connection with the state university, of which institution he was a trustee.

**LUNA**, or *Selene* (Lat. and Gr., the moon), a goddess worshipped by the Greeks and Romans. In Greek mythology she is said to be a daughter of Hyperion and Theia, and sister of Helios (the sun) and Eos (the morning), though some authorities ascribe a different parentage. As the sister of Phœbus she is sometimes called Phœbe. By Endymion she had 50 daughters, and by Zeus she was the mother of Ersa, Nemea, and Pandia. She was described as having long wings and a golden diadem, and being very beautiful. Her statue at Elis had two horns. She rode across the heavens in a chariot drawn by two white horses, cows, or mules. In art she is represented with a long robe, her veil forming an arch over her head, and above that a crescent. Among the Romans her worship is said to have been introduced by T. Tatius, in the time of Romulus. She had a temple on the Aventine hill, built by Servius Tullius, another on the Capitoline, and a third on the Palatine. The last named was lighted up every night, and the goddess was there worshipped under the name of Noctiluca. Because of her greater influence on the Roman method of calculating time, she was held in higher reverence than Sol, the sun.

**LUNA, Pedro de**, a Spanish ecclesiastic, antipope under the name of Benedict XIII., born in Aragon in 1334, died in Peniscola, Valencia, in 1424. He belonged to an old family of Spanish grandees, and devoted himself at first to the study and teaching of jurisprudence. He was made a cardinal by Gregory XI., and the antipope Clement VII. appointed him legate to Paris in order to cause Charles VI. to resist the dictum of the Paris university that both popes of that time, Clement VII. of Avignon and Boniface IX. of Rome, should resign. After Clement's death in 1394 the cardinals of Avignon elected Luna as his successor, on the condition that he should labor to quell the schism, and should resign the papal dignity whenever the pope of Rome should do the same, or the college of cardinals demand it. Luna, however, once pope, only furthered the widening of the schism, and when called upon to lay down the tiara firmly refused, whereupon it was finally agreed in a council held at Paris in 1398 to refuse obedience to him. Charles VI. attempted to compel him to resign by keeping the town of Avignon for several years in a state of siege; but Luna escaped, and in 1403, popular sentiment being again in his favor, he was recognized as the legitimate pope by France, Castile, Portugal, and Sicily. It was discovered, however, that Luna himself would do nothing to restore the unity of the church, and hence in 1407 he was again refused obedience. Luna put the disobedient under ban; but at length the council of Pisa in 1409 deposed both him and Gregory XII., and elected Alexander V. Aragon, Castile, and Scotland, however, continued to give him their support till, refusing to resign in obe-

dience to the council of Constance, he was deposed July 26, 1417, and forsaken by the powers that had hitherto supported him. He shut himself up in the fortress of Peniscola, where he held out obstinately till his death.

**LUNACY** (from Lat. *luna*, the moon). "A lunatic," says Blackstone, "is one that hath had understanding, but by disease, grief, or other accident hath lost the use of his reason; he is indeed properly one that hath lucid intervals, sometimes enjoying his senses and sometimes not, and that frequently depending upon the change of the moon." The common belief in a connection between the accessions of madness and the phases of the moon was long ago exploded, and in medical science lunacy has been displaced by the better terms insanity and mental alienation. In the law, some text writers, following Sir Edward Coke, have preferred *non compos mentis* as a generic phrase comprehensively descriptive of the various conditions of mental disease or fatuity. "Of unsound mind" has been also much employed in legal language to express certain forms of derangement. But lunacy, though absurd in itself, and in its proper acceptation referring to but a single phase of insanity, has yet gained a more conspicuous place in legal practice than any other term. Statutes, both English and American, have expressly declared that lunatic shall apply to all persons of unsound mind, and to those who are incapable of managing their affairs; and in England the name includes idiots also. Lunacy may then be fitly employed as a title under which to present the legal relations of insanity. Its medical and scientific aspects are treated under other heads. (See **INSANITY**, and **MEDICAL JURISPRUDENCE**.) Here we concern ourselves only with the settled rules of law, which determine the legal status of insane persons.—In England the custody of lunatics and idiots has until recently been vested in the court of chancery, not in its character of a court of equity, but as the delegate of the crown, the representative of the *parens patriæ*; for it is the duty of the sovereign to take care of those of his subjects who cannot take care of themselves. In the United States the people have succeeded to the rights and prerogatives of the crown, and therefore it is that here the legislature exercises a protective authority over idiots and lunatics. The statutes of the different states provide that such persons may be put under guardianship; and if a competent judicature have in the prescribed mode decided that a person is a lunatic and appointed a guardian, the fact of lunacy is held to be conclusively proved. Until the contrary be shown, either upon an inquisition of lunacy, or upon special testimony in a given case, every man is presumed to be of sane mind. But if it be proved or admitted that lunacy existed at a particular period, and that the derangement was of a habitual and not of a merely temporary or accidental nature, then it is presumed to continue, unless its continuance



be disproved. Thus, in the case of a deed, the burden of proving a grantor's insanity rests ordinarily on him who impeaches the instrument for this cause. Yet, on the other hand, proof of general and usual insanity may be rebutted by evidence that the act was done during a lucid interval, and the burden of proving this rests on the party who asserts the exception. Moral insanity alone, that is, mere derangement of the moral faculties, does not invalidate a will. The evidence must show a delusion in matters of fact. A higher degree of insanity must be shown, in order to absolve from criminal guilt, than to discharge from civil obligation. In some cases it has been held that the jury must be instructed that every man is to be presumed to be sane, and to possess a sufficient degree of reason to be responsible for his crimes, until the contrary be proved to their satisfaction; and that to establish a defence on the ground of insanity, it must be clearly proved that at the time of the commission of the act, the party accused was laboring under such a defect of reason from disease of the mind as not to know the nature and quality of the act he was doing; or if he did know it, that he did not know he was doing what was wrong. These were the rules laid down by the judges in *McNaughten's* case before the house of lords. In *Rogers's* case in Massachusetts, Chief Justice Shaw instructed the jury that in case of partial insanity the party must have sufficient power of memory to recollect the relation in which he stands to others, and in which others stand to him; and to know that the act he is doing is contrary to the plain dictates of justice and right, injurious to others, and a violation of duty. But, on the contrary, if he still understands the nature of his act and its consequences, if he has a knowledge that it is wrong and criminal, and mental power sufficient to apply that knowledge to his own case, and to know that if he does the act he will do wrong and receive punishment, the partial insanity is not sufficient to exempt him from responsibility for criminal acts. If it be found that the mind of the accused was in a diseased and unsound state, the question will be whether the disease existed to so high a degree that for the time being it overwhelmed all reason, conscience, and judgment, and whether the person in committing the crime acted from an irresistible and uncontrollable impulse. If so, then the act was not the act of a voluntary agent, but the involuntary act of the body without the concurrence of a mind directing it. Where this view of insanity prevails, such a defence must be substantially proved as an independent fact, and the burden of proof is of course on the defendant. But in other cases it has been declared that the burden is on the prosecution to establish beyond a reasonable doubt all the conditions of guilt, including criminal capacity. Evidence of acts, declarations, and conduct, both before and after the time when the alleged crime was

committed, is admissible as tending to show insanity at the moment of the act. Evidence of hereditary insanity is also admissible, both in civil and criminal cases.—Whatever be the nature or degree of mental disease, if the mind be so much impaired as to be incapable of intelligent disposal in the ordinary affairs of life, it is in civil jurisprudence irresponsible for its acts. He whose mind is so far overshadowed possesses no longer a disposing and consenting will. He is therefore incapable of making contracts, for a contract requires a concurrence of wills. When one of the parties to a contract of marriage lacks the capacity of consent, there is no mutually binding promise, and the marriage is void. Whether, in a given case, such a disability existed as to render the contract impossible, is generally declared and the nullity of the marriage pronounced by competent judicial authority. But though the contracts of an insane man are necessarily void, he has not always been permitted to repudiate them. Until the time of Edward III. no objection seems to have been made to such a proceeding. Afterward the absurd maxim grew into a rule, recognized by the most eminent legal authorities, that no man should be permitted to stultify himself. The strictness of the rule was gradually relaxed; not at first on the ground that lunacy was a defence in itself, but that it was competent evidence to show that undue advantage had been taken of a party, or that actual fraud had been practised upon him, by reason of his imbecility. This rule is now abandoned, and if one enters into a contract while he is deprived of reason he may avoid it when he recovers his sanity. Yet the exception is admitted that one may not plead his lunacy to annul his contract for necessities made with him in good faith by the other party; nor if, in fact, no advantage were taken of the lunatic, can a purchase made in good faith be rescinded, if injustice would thus be wrought to the other party, and both cannot be placed *in statu quo*.—A testament discloses the will of the testator; but when a disposing will fails, a testament is impossible, and the writing which purports to be one is a nullity. It is naturally very difficult to prove the existence of a lucid interval; far more difficult than to prove the existence of general insanity. It is sufficient for the purposes of the law that the mind appears to have been rational when the will was made. Indeed, the will itself may furnish strong, perhaps the best evidence of the lucid interval. If testimony can be adduced to show that the act was done without any assistance, and the writing itself discloses no marks of delusion or folly, no further proof can generally at least be required.—It has been already stated that the same degree of incapacity which invalidates civil acts, does not exempt from criminal responsibility. When insanity is pleaded to a charge of crime, the real question which the law entertains is: Was there a criminal intent? was the accused capa-

ble of that criminal will which is the essence of the offence? From the nature of the case the law has found it difficult to answer these questions; and perhaps it has not always answered them well. The doctrine of Sir Matthew Hale has exerted a large influence on the course of English decisions. He was disposed to determine the criminal responsibility of a mind affected with insanity by its strength and capacity; and said: "Such a person as, while laboring under melancholy distempers, hath yet ordinarily as great understanding as usually a child of 14 years old hath, is such a person as may be guilty of treason or felony." But such a rude test could not be permitted when juster views of mental disease had come to prevail among scientific men; and accordingly we find the nicety of the test a little advanced when the inquiry became whether the accused had so far lost the use of his understanding as not to know right from wrong. With the single qualification that this test should be applied to the particular act committed, this criterion has been long in use, with only slight and immaterial variations, in the English criminal law. It was laid down in Bellingham's case, by Sir James Mansfield, in 1812. In that case the court went to what is now considered an extreme length, and instructed the jury that if a person affected by that species of insanity in which the patient fancies the existence of injury and seeks an opportunity of gratifying his revenge by some hostile act, be yet capable in other respects of distinguishing right from wrong, this would be no excuse for any act of violence which he might commit under this species of derangement. So Baron Rolfe, in the case of the queen against Stokes in 1848 (and he was quoted and followed by Baron Parke in Barton's case in the same year), said the subject had been lately carefully considered by the judges, and the law was now clear; every man is responsible for his acts by the law of his country if he can discern right from wrong. In the trial of Pate (1850) for an assault upon the queen, in which an uncontrollable impulse was urged in defence, Baron Alderson said in summing up: "It is not because a man is insane that he is unpunishable; and I must say that upon this point there exists a very grievous delusion in the minds of medical men. The only species of insanity which excuses a man for his acts is that species of delusion which induced to, and drove him to the commission of the act alleged against him. The jury ought to have clear proof of a formed disease of the mind; a disease existing before the act was done, and which made the accused incapable of knowing at the time that it was a wrong act which he was about to commit. The law does not acknowledge the doctrine of an uncontrollable impulse, if the person was aware that the act which he contemplated was wrong. The question you have to decide is: Was the accused at the time suffering from a disease of the mind which rendered him in-

capable of judging whether the act he committed was a right or a wrong act?" In one class of cases the test of responsibility is therefore to be, whether the prisoner knew that the act which he committed was wrong, and right and wrong in these cases are probably to be understood as Lord Brougham explained them in McNaughten's case, viz.: right must be understood of right according to the law, and wrong of an act condemned and punishable by law.—Another class of cases is that in which responsibility is modified by the existence of delusion. This form of insanity was first brought before and recognized by the courts in the celebrated case of Hatfield in 1800. In that case the prisoner was put upon his trial for firing at the king. Mr. Erskine defended him successfully, and procured the acquiescence of the court in his views of the irresponsibility of the accused. Hatfield labored under the delusion that it was his duty to sacrifice himself for his fellow men, and he conceived that the best mode to draw upon himself the punishment of death was to make an attempt upon the life of his sovereign. It was not denied that Hatfield knew right from wrong, and that the act which he contemplated was punishable by the law; indeed, it was just that which he did know and directly contemplated; yet so powerful was his delusion, that the act which it prompted could not be said to proceed from the motion of his own free will. So clearly and forcibly did Mr. Erskine present the grounds of the defence, that the court, Lord Kenyon, advised the withdrawal of the prosecution, and the argument of the eminent counsel became a precedent and authority in the law. This same plea of delusion was successfully urged for Martin, who set fire to the minster of York, in obedience, as he said, to the command of Heaven. In 1843 the English law upon this matter was set forth in the case of McNaughten by the judges in the house of lords. The judges say that if there be only a partial delusion, and the party is not in other respects insane, he must be considered in the same situation as to responsibility as if the facts with respect to which the delusion exists were real. For example, if, under the influence of such a delusive idea, one supposes another to be in the act of attempting to take his life, and he kills that other, as he supposes in self-defence, then he would be exempt from punishment. But if the delusion were that the deceased had inflicted a serious injury upon his character and fortune, and he therefore killed him in revenge, then the aggressor must be held guilty. It was also the opinion of the judges that, notwithstanding a party accused did an act which was in itself criminal under the influence of insane delusion, with a view of producing some public benefit, or of redressing some supposed wrong, yet he was responsible if he knew that he was acting contrary to the law of the land. In Massachusetts, in the well known case of Rogers, delusion was admitted to be a legal

test of insanity. It was there held that if a party under a real and firm though insane belief do an act which would be justifiable if the imaginary fact existed, then he is not responsible.—The tests already considered, namely, the consciousness of right and wrong, and delusion, apply to the intellectual faculties alone. But the moral faculties, not less than the intellectual, may become deranged. Passions and propensities may be so extremely developed as to destroy the balance of the mind and defeat the supremacy of the will. This condition of mental disorder, moral insanity, as it is called, has received a partial recognition by the law. The nicer degrees of it, for which medical men contend, have not found so much favor in the eyes of the courts. When the claim of indulgence for this sort of mental infirmity has been plainly reasonable, it has however been admitted and favored. This has been the case in respect to that form of insanity known as homicidal mania. The perpetrator may be perfectly capable of distinguishing right from wrong, not only abstractly, but also in reference to the particular act. Further, there may be, in fact generally is, no delusion in respect to the victim. The act is the offspring of an uncontrollable impulse; the party knows the nature of the act which he is about to commit, but has not the power to choose otherwise than as he does; and because the will is not here concerned, the homicide is not answerable for his act.—So far then as adjudicated cases go, insanity is admitted as a good plea: 1, when at the commission of the act the offender was incapable of distinguishing whether it was right or wrong; 2, when the act was done under a delusion in respect to the existence of facts which, had they actually existed, would have constituted a good defence; and 3, if the act were committed under the influence of mental disease great enough to overpower the will, though neither delusion nor any like provocation of the act be discovered. But it is not to be denied that the whole subject is surrounded by difficulties which lead to the most startling anomalies in practice. Mr. Bishop, in his treatise on criminal law (§ 474), well says: "The labors of writers on insanity have been exhausted in attempts to find some test of ready application to determine when a person is to be deemed insane, and when not, in reference to his responsibility for crime. And judges, less informed on this subject than on most other subjects of legal science, have struggled under the inherent embarrassments of the question itself, under the influence of erroneous notions in the community, and under the failures of counsel and witnesses in particular cases to present the real points of inquiry. The result has been that instructions given in reference to particular facts appearing in the cases before them have seemed to casual observers to be very discordant, while to scientific inquirers after the facts of insanity they have seemed very absurd." The conflicting views of scien-

tific men regarding the tests of insanity, which enable parties in all important cases to bewilder the jury with conflicting testimony of experts, have done much to discredit unjustly all expert testimony; and the resort to the defence of insanity when homicide has been committed in revenge for actual or pretended domestic wrongs, has thrown suspicion and discredit on the defence generally. Besides the English and Massachusetts cases referred to above, and which have considered the subject of criminal capacity in persons insane or laboring under delusion, the important cases of *Freeman v. People*, 4 Denio, 9; *Commonwealth v. Mosler*, 4 Penn. State R., 267; *Flanagan v. People*, 52 New York, 467; *State v. Spencer*, 1 Zabriskie (N. J.), 196; *State v. Felter*, 25 Iowa, 67; and *State v. Jones*, 50 N. H., 369, may be named, which however, in some particulars, are wholly irreconcilable with each other or with the English cases. The tendency of decision has been in the direction of giving more latitude to the jury in judging of the symptoms and tests of mental disease; and this culminated in the trial of Cole in New York, for the murder of one whom he charged with adultery with his wife, in which the jury, in substance, found that the accused was insane at the moment of committing the act, but sane immediately before and immediately afterward.

**LUNALILLO, William Charles**, sixth king of the Hawaiian Islands, born in Honolulu, Jan. 31, 1835, died there, Feb. 3, 1874. He was descended from the chieftain Keoua, the father of Kamehameha I., who united the islands under one government. Lunalilo's mother, Kekauluohi, was the daughter of Kaleimamahu, a half brother of Kamehameha I. In Hawaiian descent the maternal rather than the paternal lineage ennobles; and Lunalilo thus inherited from his mother the highest rank among the hereditary chiefs, though his father, Charles Kanaina, the second husband of Kekauluohi, was a commoner. Lunalilo was educated at the royal school established by the American missionaries at Honolulu in 1839. There, in company with Kamehameha IV. and V., and other scions of the chiefs, he became well versed in the common branches of an English education, displaying particular tastes for literature and poetry. In 1860 he visited California with the chiefs Lot and David, who respectively preceded and succeeded him as king. His disposition was amiable. Before his accession to the throne his habits were dissipated, but he became a good and popular ruler. His predecessor, Kamehameha V., died Dec. 11, 1872, without appointing a successor. On Jan. 1, 1873, Lunalilo received the votes of nearly all the electors in the kingdom; on the 8th of the same month the legislature confirmed his election; and on the 9th he was crowned king. He too died without appointing a successor, after a reign of one year and 25 days; and on the 12th of the same month the chief David Kalakaua was appointed king by the legislature.

**LUNAR CAUSTIC**, or Nitrate of Silver. See NITRATES.

**LUNAR CYCLE**, or Metonic Cycle, a period of 19 solar years, containing 235 lunar months and 6,940 days. This astronomical period was adopted by the Greeks in 432 B. C., at the

motion of Meton and Euctemon, but it is a matter of doubt whether they were its inventors. It was the first exact calendar in general use, and in using the moon for measuring months nothing could be better. The calendar was, according to Ideler, as follows:

MONTHS.	YEAR OF THE CYCLE.																		
	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.
Hecatombæon .....	30	29	30	30	30	30	29	30	30	30	29	29	30	30	30	29	29	30	30
Metageintion .....	30	30	29	30	30	29	30	29	29	29	30	30	29	29	29	30	30	29	29
Boedromion .....	29	29	30	30	29	30	29	30	30	30	29	29	30	30	30	29	29	30	30
Pyaneption .....	30	30	29	29	30	30	30	29	29	30	30	30	29	29	29	30	30	30	29
Mæmacterion .....	29	29	30	30	29	29	29	30	30	29	29	29	30	30	30	29	29	30	29
Poseideon .....	30	30	29	29	30	30	30	29	29	30	30	30	29	29	30	30	30	29	29
Poseideon II. (in leap years) .....	.....	30	.....	29	.....	.....	.....	30	.....	.....	.....	30	.....	.....	.....	.....	.....	.....	29
Gamelion .....	29	30	29	30	30	29	29	29	30	29	29	29	29	30	29	30	29	29	30
Anthesterion .....	30	29	30	29	29	30	30	30	29	30	30	30	30	29	30	30	30	30	29
Elaphebolion .....	29	30	30	30	30	29	30	29	30	29	29	29	29	29	29	29	29	29	30
Munychion .....	30	29	29	29	29	30	29	30	29	30	30	30	30	29	30	30	30	30	29
Thargelion .....	29	30	30	30	29	29	30	29	30	29	29	29	29	30	29	29	29	29	30
Scorphanon .....	30	29	29	29	30	30	29	30	29	30	30	29	29	30	29	30	30	30	29
Number of days in a year...	355	354	354	354	354	355	354	354	354	355	354	354	354	354	355	354	354	354	354

In this manner the differences from the exact periods of the celestial bodies are everywhere reduced to a minimum, and at the end of the cycle there is a difference of only +9 hours 35 minutes from 19 solar years, and of 7 hours 29 minutes from 235 lunar months. Calippus attempted to overcome these inaccuracies by taking four Metonic cycles, and omitting one day in the fourth, which rendered his calendar similar to the subsequent Julian calendar. With this correction the lunar cycle is the best calendar except the Gregorian, over which it has the advantage that each month agrees with the cycle of phases within less than a day. The lunar cycle was in use in Greece, Macedonia, Asia Minor, and other countries. The Jews also adopted it, but they changed the leap years to the 3d, 6th, 8th, 11th, 14th, 17th, and 19th years of the cycle, and introduced a Veadar after Adar, or the sixth month.—See Mädler, *Geschichte der Himmelskunde* (Brunswick, 1873).

**LUND**, a town of Sweden, in the læn of Malmö, on an extensive plain about 6 m. from the Sound, and 21 m. E. of Copenhagen; pop. in 1869, 10,526. There are several tanneries and woollen manufactories in the town. The cathedral is a large irregular edifice, said to have been founded in the 11th century and enlarged at different periods. In size it is the third church in Sweden. The chief object of interest at Lund is the university, opened in 1668, the only one in Sweden besides that at Upsal. It has a library of 100,000 volumes, and several museums and collections of natural history and mineralogy. Pufendorf was professor of the law of nature and of nations in this university in 1670. Lund is a place of great antiquity, and in pagan times is said to have had 80,000 inhabitants. In the middle ages it was the seat of an archbishop, who was considered the primate of the north, but the archbishopric was abolished under Gustavus I. A great battle was fought here, between the

Danes and Swedes in December, 1676, in which 10,000 men were killed. A treaty concluded here terminated the war in 1679.

**LUNDY, Benjamin**, an American abolitionist, born at Handwich, N. J., Jan. 4, 1789, died at Lowell, Ill., Aug. 22, 1839. His parents were members of the society of Friends. When about 19 years of age he removed to Wheeling, Va., where his attention was first directed to the subject of slavery. He afterward resided at Mt. Pleasant, Ohio, and then settled in St. Clairsville, Va., where in 1815 he originated an anti-slavery association called the "Union Humane Society," and wrote an appeal on the subject of slavery. He then visited St. Louis, where he remained nearly two years engaged in a newspaper exposition of the slavery question. Returning to Mt. Pleasant, he commenced in January, 1821, the publication of the "Genius of Universal Emancipation," the office of which was soon removed to Jonesboro, Tenn., and thence to Baltimore in 1824. In 1825 he visited Hayti to make arrangements for the settlement of emancipated slaves. In 1828 he visited the eastern states, where he formed the acquaintance of William Lloyd Garrison, and afterward became associated with him in editing his journal. Shortly after he was assaulted for an alleged libel, and indirectly censured by the court, and in 1829 removed to Washington. In 1830-'31 he travelled in Canada and Texas to obtain subscribers to his paper, and to continue his observations on the condition of the blacks. He made a second trip to Texas in 1833, returned the following year, and immediately afterward undertook another journey to Texas and Mexico. He was the first to establish anti-slavery periodicals and deliver anti-slavery lectures, and probably the first to induce the formation of societies for the encouragement of the produce of free labor. "The Life, Travels, and Opinions of Benjamin

Lundy," by Thomas Earl, was published in Philadelphia in 1847.

**LUNDY'S LANE, Battle of**, called also that of Bridgewater or Niagara, fought in Canada near the falls of Niagara, between the British and American forces, July 25, 1814. Gen. Brown, the American commander, being encamped on the Chippewa with 3,000 men, and learning that Gen. Drummond had crossed the Niagara at Queenstown to attack Fort Schlosser, sent Col. Winfield Scott with 1,200 men to make a demonstration on Queenstown. About sunset Scott suddenly came upon the British Gen. Riall, with his whole force and a battery of seven pieces, posted on an eminence at the head of Lundy's lane,  $1\frac{1}{2}$  m. from Niagara Falls. Though having an inferior force, Scott at once assumed a position of attack, and sent Major Jessup with a battalion to turn the British left. This movement was successful, and Riall and his staff were captured; but Scott suffered heavy loss from the fire of the battery (increased to nine guns), until Brown with the remainder of his troops arrived on the field at nightfall. Under cover of almost total darkness, the whole force was sent forward to capture the battery. When they had nearly reached the guns they were discovered, and a volley of grape drove back one regiment in disorder. The others, under Scott, pushed on steadily, fired one volley, charged with a shout, and captured the battery, driving the enemy down the hill. The British made three attempts to regain it, all of which were handsomely repulsed. Brown and Scott were wounded, and the command devolved upon Gen. E. W. Ripley, commander of the second brigade, who was also wounded and withdrew to the camp, leaving the captured guns for want of horses to drag them off. The loss of the Americans in killed and wounded was 743; that of the British 878.

**LÜNEBURG**, a town of Prussia, in the province of Hanover, on the Ilmenau, 68 m. N. N. E. of Hanover; pop. in 1871, 16,284. It has an air of antiquity, and contains a town hall (*Rathhaus*), noted for its fine relics and works of art, and containing a library of more than 30,000 volumes. The principal church is the Johanniskirche, a structure in pure Gothic style, with a spire 380 ft. high; it was restored in 1857. There are manufactories of sugar, salt, tobacco, &c. Vast numbers of horses are annually brought to the market. From 1267 to 1369 the town was the residence of the dukes of Lüneburg. It was a member of the Hanse union. The extensive heaths between it and Celle and Verden are known as the *Lüneburger Heide*.

**LUNEL**, a town of Languedoc, France, in the department of Hérault, on the canal of Lunel, which brings it into connection with the Rhône and the Mediterranean, 14 m. N. E. of Montpellier; pop. in 1866, 6,989. It has a communal college and numerous distilleries. The trade in Muscat wines and raisins

is very brisk. In the middle ages a large portion of the inhabitants were Jews, who had flourishing schools.

**LUNENBURG**, a S. E. county of Virginia, bounded N. by the Nottoway and S. by the Meherrin river; area, 410 sq. m.; pop. in 1870, 10,403, of whom 6,059 were colored. The surface is generally level and the soil moderately fertile. The Richmond and Danville railroad skirts the N. W. part. The chief productions in 1870 were 38,529 bushels of wheat, 107,174 of Indian corn, 77,394 of oats, 963,673 lbs. of tobacco, and 33,667 of butter. There were 1,109 horses, 1,487 milch cows, 2,240 other cattle, 2,639 sheep, and 5,698 swine. Capital, Lewistown.

**LUNENBURG**, a S. E. county of Nova Scotia, Canada, bordering on the Atlantic, and watered by the La Have river and other streams; area, 1,115 sq. m.; pop. in 1871, 23,834, of whom 16,612 were of German, 3,439 of English, 1,684 of French, 987 of Irish, and 781 of Scotch origin or descent. The coast is indented by numerous bays. The climate is fine and the soil good. Farming and fishing are the chief occupations. Capital, Lunenburg.

**LUNÉVILLE**, a city of Lorraine, France, in the department of Meurthe-et-Moselle, on the right bank of the Meurthe, near its junction with the Vezouze, 16 m. S. E. of Nancy; pop. in 1866, 15,184. It contains the largest cavalry barracks (accommodating over 6,000 horses) and the finest riding school in France. Vast bodies of cavalry are frequently collected there in the autumn, when military exercises are practised. Under Louis XIII. it was taken from the house of Lorraine by the French. A treaty of peace was signed there Feb. 9, 1801, between the German empire and France.

**LUNGS**, in man, as well as in quadrupeds, birds, and reptiles, the principal organs of respiration. The lungs always consist of membranous sacs, contained in the interior of the body, into which the atmospheric air is introduced through the air passages, and the walls of which are abundantly supplied with capillary blood vessels. The blood, thus brought into close relation with the atmospheric air, being separated from it only by the extremely delicate and transpirable pulmonary membrane, absorbs oxygen in its passage through the lungs, and exhales at the same time watery vapor, carbonic acid, and various animal excrementitious substances. The lungs therefore constitute an organ in which the blood is purified from its deleterious ingredients, and is also supplied with a gaseous element essential to the continuance of life. This is the object of the function of respiration.—In many of the naked reptiles, or batrachians, the lungs consist of simple, straight, tubular sacs, communicating with the pharynx by a common orifice, and terminating posteriorly by rounded extremities. Their internal surface is smooth, and the air, forced into them by a kind of deglutition, suffices for the imperfect respiration



performed by these animals. In others, as in the frogs, and still further in turtles and saurians, the lungs are more important and more complicated in structure. They are still air sacs; but their cavities are divided into a considerable number of secondary spaces or areolae, by incomplete partitions, of a thin membranous texture, projecting from their internal surface. This increases very much the extent of the respiratory membrane; and as the blood vessels penetrate everywhere the substance of the partitions, as well as the rest of the pulmonary walls, the mutual action of the air in the sacs and the blood in the vessels is greatly intensified, and the same result is accomplished in a comparatively short period. Thus pulmonary respiration in these animals is more active in proportion to the increased involution of the pulmonary membrane. This complication of the structure of the lungs is carried to the greatest extent in the warm-blooded animals and in the human species. In man the respiratory apparatus commences at the larynx, which communicates by the opening of the glottis with the pharynx. The larynx is continuous below with the trachea, a cylindrical tube, four inches in length and nearly one inch in width, running down the anterior part of the neck, on the median line, to the top of the chest. It is composed of a fibrous membrane, strengthened by a series of cartilaginous rings, complete in front but open posteriorly, which serve to maintain the cylindrical form of the trachea, and to keep its cavity open for the free passage of the air. It is lined with a mucous membrane covered with ciliated epithelium. At the upper part of

ous divisions to every part of the lungs, and becoming constantly more delicate and membranous in their texture. They are now called the bronchial tubes; and their smaller ramifications lose altogether their cartilaginous element, and consist only of a fibro-elastic tubular membrane. Each terminal bronchial tube finally goes to a special division of the pulmonary tissue, termed a lobule. This is an air sac of a more or less conical form, the bronchial tube opening into it at its apex, while its base is turned in the opposite direction. The interior of the lobule, like the entire lung of the frog, is imperfectly divided by membranous partitions into secondary cavities of a cup-like form, all of which, though separated from each other, communicate with the central cavity of the lobule.

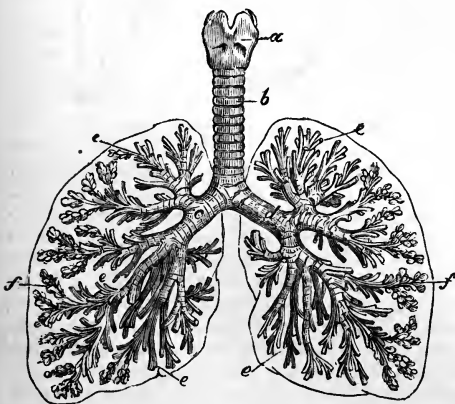
These terminal cavities, into which the air finally penetrates, are called the air vesicles. The air vesicles are rounded cavities, about  $\frac{1}{16}$  of an inch in diameter, lined with a single layer of pavement epithelium. They are surrounded by a tissue containing a large proportion of elastic fibres, in which also ramify the capillary blood vessels. Owing to the small size and excessive multiplication of these air vesicles, the entire extent of respiratory membrane in the human lung is very great. It has been estimated by Lieberkühn at not less than 1,400 sq. ft.; and there is reason to believe that this estimate is not an exaggeration.

—The tissue of the lungs is thus of a spongy nature; that is, it contains a multitude of minute cavities, filled with air, disseminated through a soft, moist, fibrous, and vascular texture. Accordingly, unlike any of the other internal organs, the lungs are lighter than water, and float upon its surface when separated from the body. They also retain the

air entangled in their substance with such obstinacy that it cannot be expelled by any compression or violence short of absolutely disintegrating the pulmonary substance; and the lungs, if healthy, will still float upon the surface of water even after they have been bruised

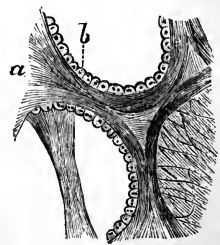


Two of the Lobules of the Human Lung.—*a*. Small bronchial tube, a terminal branch of which goes to each lobule. *b*. Rounded air vesicles, projecting from the surface of the lobule.



Arrangement of Air Passages in the Human Lungs.—*a*. Larynx. *b*. Trachea. *c*, *d*. Bronchi. *e*. Bronchial tubes. *f*. Lobules.

the chest the trachea divides into two main branches, of a structure similar to its own, the right and left bronchi, each of which passes to the root of its corresponding lung. Here the bronchi begin to divide, subdivide, and ramify, radiating in smaller and more numer-



Air Vesicles of the Human Lung, partially cut across, and highly magnified.—*a*. Fibrous tissue intervening between the vesicles. *b*. Layer of epithelium cells, lining the internal surface of a vesicle.

and mutilated to an excessive degree. This has given rise to the "hydrostatic test" for determining whether a newly born infant, found dead, has been born alive. The lung which has never breathed sinks in water like any other solid organ; but if respiration has been once completely established, the lung floats, and cannot be made to sink by any ordinary method of manipulation. The application of this test, however, requires several precautions in particular cases, which are usually fully discussed in works on medical jurisprudence.—The lungs, as a whole, are conical in shape, their apices situated at the top of the chest and projecting slightly into the root of the neck, and their base, which is concave in form, resting upon the upper surface of the diaphragm. They are of a pinkish gray color, and are variegated with spots and streaks of a dark ashen or blackish hue. They are quite elastic in consistency, owing to the abundant elastic fibres which they contain; and accordingly, when taken out of the chest, or even when the chest is widely opened, they spontaneously expel a portion of the air which they contained during life. Enough, however, still remains to give them the characteristic buoyancy by which they are distinguished. Each lung is covered, over the greater part of its surface, by a thin, smooth, moist, and polished serous membrane, the pleura, which, reflected outward at the root of the lung, also lines the internal surface of the thoracic cavity. These two free surfaces of the pleura being in contact with each other, or separated only by an extremely thin layer of serous fluid, the lungs and the walls of the chest slide gently over each other in the movements of respiration, without friction or injury.—The lungs are supplied with blood from two sources. First, the pulmonary artery brings the venous blood from the right ventricle of the heart and distributes it to the pulmonary capillaries, when it is returned to the left auricle by the pulmonary veins. This blood, which is in great quantity as compared with the amount of solid substance in the pulmonary tissue, is brought to the lungs, not for the nutrition of these organs, but for its own aëration. Secondly, the bronchial arteries, a number of small vessels which come off from the thoracic aorta, and follow the ramifications of the bronchi and bronchial tubes, supply these tissues with arterial blood for the purpose of their own nutrition. It is returned to the right side of the heart by the bronchial veins. The nerves of the lungs consist of the pulmonary branches of the pneumogastric nerve, and the pulmonary plexuses of the sympathetic. They are also provided with an abundant supply of lymphatic vessels; and the lymphatic glands belonging to them, known as the "bronchial glands," often become very conspicuous at the root of the lungs, from the deposit in adult life of a dark pigmentary matter in their substance.—The lungs are liable to a variety of acute and chronic diseases, the

most important of which are pneumonia, or inflammation of the lungs, and pulmonary phthisis, or a wasting of the lungs owing to a tuberculous deposit in their substance. (See BRONCHITIS, CONSUMPTION, and PNEUMONIA.) They are also liable to be compressed by serous effusions into the cavity of the pleura, to be wounded by the extremity of a fractured rib, or to be the seat of hæmoptysis or of pulmonary apoplexy.

**LUNGWORT** (*pulmonaria officinalis*), a perennial herb of the borage family, a native of Europe, and frequently found in old gardens. The creeping root stock throws up a large tuft of ovate-oblong leaves, which are coarsely hairy, with their dark green upper surface marked with numerous whitish spots; the flowers, which appear in spring, are in terminal clusters, on stems 6 to 12 in. high, rose-colored, changing to blue; there are several garden forms, varying in the size and marking of their foliage and the color of their flowers.



Lungwort (*Pulmonaria officinalis*).

The name would indicate that the plant had at one time a medicinal reputation; the spotted leaves were supposed by the old herbalists to resemble diseased lungs, and thus indicate its value in pulmonary diseases; it is, like some others of the family, simply mucilaginous.—Smooth lungwort (*Mertensia Virginica*), formerly classed as a *pulmonaria*, is indigenous in New York and southward; it has something of the habit of the foregoing, but its leaves are smooth and spotless; its flowers are of an indescribably beautiful blue; and the plant is worthy of a place in the finest garden.

**LUNT, George**, an American author, born in Newburyport, Mass., Dec. 31, 1803. He graduated at Harvard college in 1824, studied law, and commenced the practice of the profession in his native town. While preparing for the bar he was principal of the Newburyport high school. He was several times a member of the state legislature, both as a representative

and senator. He began to write and publish poetry at an early age. A small volume of his poems appeared in 1839, and another in 1843 entitled "The Age of Gold." In 1845 he delivered a poem before the Boston mercantile library association called "Culture," which was afterward published. In 1848 he removed to Boston, and in the following year was appointed by President Taylor United States district attorney for Massachusetts, and held the office till March, 1853. In 1857 he became editor of the "Boston Courier," a democratic daily journal, which he conducted for many years. He has published a volume of poems entitled "The Dove and the Eagle" (1851); "Lyric Poems" (1854); "Julia" (1855); "Eastford, or Household Sketches" (a novel), under the pseudonym of Westley Brooke (1855); "Three Eras of New England, and other Writings" (1857); "Radicalism in Religion, Philosophy, and Social Life" (1858); and "Origin of the Late War" (1866).

**LUPERCALIA**, the ancient Roman festival of purification and expiation, celebrated annually on the 15th of February (a month called from *Februa*, another name for the festival), in honor of Lupercus (surnamed Februus, from *februum*, a purgation), the god of fertility. The appropriate sacrifices were goats and dogs, after the offering of which two patrician youths were led forward to the altar, and one of the priests touched their foreheads with a sword dipped in the blood of the victims; another immediately washed off the stain with wool and milk. The priests next partook of a banquet, at which they were plentifully supplied with wine. This over, they cut the skins of the goats that had been sacrificed into pieces, with some of which they covered parts of their bodies, in imitation of Lupercus, who was represented half naked, and half clad in goat skins; with the other pieces, cut into thongs, they ran through the streets, striking every person whom they met, especially females, who courted the flagellation from an opinion that it averted sterility and the pangs of parturition. Antony, on the day when he offered Cæsar the diadem, was officiating as a priest of Lupercus. The ceremonies of this festival are supposed to have symbolized the purification of the people. The order of the Luperci, said to have been instituted by Romulus and Remus, formed a college of which none could originally be members save the noblest patrician youths. This college at first consisted of two classes, styled the Fabiani and Quinctiliani, to which Cæsar added a third, named Juliani; and hence the two former classes are termed by later writers *Luperci veteres*.

**LUPINE**, the common name of plants of the genus *lupinus*. There is some doubt as to the origin of the name, but most authors regard it as coming from *lupus*, a wolf, and as having reference to the voracity of the plants in devouring the fertility of the soil. The genus belongs to the papilionaceous suborder of the

great family of *leguminosæ*, and contains about 80 species, some 56 of which are North American; the remainder are South American, with a few in the Mediterranean region. The country between the Rocky mountains and the Pacific is so rich in these plants as to be known to botanists as the lupine region. The species are herbs or half-shrubby plants, and comprise both annuals and perennials, with simple or digitately compound leaves, and flowers mostly in terminal racemes; the flowers are usually showy, mostly blue, though some are white, yellow, and variegated; the stamens are united into a tube by their filaments; the pod flattened, with thick valves, and often constricted between the rather large seeds. One species, the common wild lupine (*L. perennis*), is found from Canada to Florida, and as far west as the valley of the Platte; it is common in sandy soils, and is sometimes found in such abundance as to exclude almost all other vegetation. Its stem is erect and somewhat hairy; its leaves are digitate, consisting of from eight to ten lanceolate wedge-shaped leaflets, arranged around the end of the petiole; its flowers, on a terminal spike, are blue, or sometimes rose-colored, and specimens have been found with pure white flowers. The root is perennial, and throws up each successive season increasing flowering stems; it grows readily from the seeds. A natural patch of these charming plants overspreading a large area of sand, clothing the barren waste with beauty, cannot fail to attract the eye. Artificially propagated, the wild lupine succeeds best when raised from seeds, and in such



Many-leaved Lupine (*Lupinus polyphyllus*).

cases blossoms in the second or third year. The other eastern species are *L. villosus* and *L. difusus*, both perennials with simple and very silky leaves; these are not found north of Georgia and North Carolina. The most widely known species of the Pacific coast is the

many-leaved lupine (*L. polyphyllus*), as that has long been in cultivation as a showy garden plant; its stems grow 2 to 5 ft. high; the long-petioled leaves have 10 or more leaflets, and the raceme, 1 to 2 ft. long, is covered with blue or purple flowers; in some instances the flowers are white. Large, well established clumps of this are exceedingly beautiful; it is readily raised from seed, but the plants should be set where they are to bloom when quite young, as large specimens are apt to die when transplanted; this is sometimes found in gardens under the name of *L. macrophyllus*. Among the yellow-flowered species of the western coast are *L. arboreus*, *L. sulphureus*, &c.; and among the white-flowered ones, *L. densiflorus* is sometimes seen in gardens. *L. arboreus* often reaches the height of 10 ft. and forms a large bush, which is quite shrubby at base; while an annual species (*L. uncialis*), recently described by Mr. Watson, is less than an inch high.—Some of the exotic lupines in cultivation are the yellow lupine from Europe (*L. luteus*); the hairy lupine (*L. hirsutus*), with very hairy leaves and pods, and flowers blue, rose color, or white; and the white lupine (*L. albus*), which has its leaves smooth above and hairy beneath, and smooth pods. The last named species grows spontaneously in the Mediterranean region, and was formerly used as pulse; it is now employed in continental Europe as a green manure, the crop being ploughed under for the purpose of enriching the soil, in the same manner that our farmers use clover and buckwheat, a practice mentioned by Columella and other early writers on agriculture; the seeds of this species, as well as those of *L. termis*, are sparingly used as food by Egyptians and Arabs; the seeds are fed to poultry, and the young tops of the plants are eaten by cattle.—Perhaps the most important economical use of the lupines is one recently determined by the experiments of the San Francisco park commission. Much of the land directly upon the coast consists of shifting sands; deep cuttings disclosed the fact that the roots of some species of lupine penetrated to the depth of 20 ft., and suggested the idea that these plants might be made useful in binding the loose sands; barley, which germinates more rapidly than the lupine seed, was sown to protect the lupines while very young, and this held the sands until the slower-growing plants became established; the species of lupine selected were *L. arboreus* and *L. albi-frons*, which grow naturally in such situations. In a single year the lupines covered the sands with a dense vegetation 2 to 3 ft. high, sufficient to prevent them from shifting during the severest storms, and to allow of the growth of various maritime pines, willows, and other trees, as well as such grasses as flourish in sandy localities.—A revision of the genus *lupinus*, by Sereno Watson, is to be found in the "Proceedings of the American Academy of Arts and Sciences," vol. viii. (May 13, 1873).

**LURCHER.** See GREYHOUND.

**LURISTAN**, a province of Persia, bordering on Irak-Ajemi, Fars, and Khuzistan; area, about 20,000 sq. m.; pop. unknown. It is extremely mountainous, being bordered by the Elwend, Awas, and Luristan ranges, and having the Bakhtiari running through it, parallel with these, from N. W. to S. E. It is watered by the upper courses of the Kerkha and Karun rivers. Many of the valleys are luxuriant and fruitful; but the inhabitants are entirely nomadic, and there is no agriculture. Several tribes, dwelling in tents, wander about here, owing no allegiance but to their immediate chiefs, and waging continual war upon one another. The most ferocious of these are the Bakhtiari. The only town is Khorremabad, 90 m. S. of Hamadan, which contains about 1,000 huts, a fortress, and a palace.

**LUSATIA** (Ger. *Lausitz*), a region of Germany, which formerly constituted the two margraviates of Upper and Lower Lusatia, the former being the southern division. They were bounded N. by Brandenburg, E. by Silesia, S. by Bohemia, and W. by the duchy of Meissen; area about 4,200 sq. m., of which the southern part is mostly mountainous. The inhabitants are Germans and Wends, the latter descendants of the ancient Slavic Lusici and Milzieni, and speaking a peculiar Slavic dialect. Lusatia was made tributary to the German empire in the earlier part of the 10th century by Henry I., and finally subdued and converted to Christianity by his successor Otho I. Its possession, however, was for many centuries an object of contention between the princes of Poland, Bohemia, Brandenburg, and Meissen. In the latter part of the 15th century it submitted to Matthias Corvinus, king of Hungary. After his death it was reannexed to Bohemia, with which it became subject to Ferdinand I. of Hapsburg, brother of the emperor Charles V., in 1526. Having revolted during the thirty years' war against the sway of Ferdinand II., it was subdued by John George, elector of Saxony, and ceded to him in 1635. By the treaty of Vienna of 1815 all Lower with a part of Upper Lusatia was ceded to Prussia, the former being annexed to the province of Brandenburg, and the latter to that of Silesia. The remaining part of Upper Lusatia forms the circle of Bautzen in Saxony. Gorlitz, Luckau, and Guben are among the principal towns of Prussian Lusatia; Bautzen, Zittau, and Camenz, among those of the Saxon jurisdiction.

**LUSHINGTON, Stephen**, an English jurist, born in London, Jan. 16, 1782, died Jan. 21, 1873. He was the second son of Sir Stephen Lushington. He was educated at Eton and Oxford, was called to the bar at the Inner Temple in 1806, and became an advocate at doctors' commons in 1808. In 1820 he was one of the counsel engaged in the defence of Queen Caroline. He was appointed judge of the consistory court in 1828, and of the high court of admiralty in 1838. He was a liberal member

of parliament, which he first entered in 1807 and finally left in 1841, when the act disqualifying judges of the admiralty to sit in the house of commons impelled his retirement from political life; and ill health made him withdraw from the bench in July, 1867. He was the legal adviser of Lady Byron, and gave his opinion that the offence of her husband, as stated by her, was one which should for ever preclude any reunion between them. He died without disclosing the secret.

**LUSITANIA**, in ancient geography, the country of the Lusitani, and in a wider sense the name of one of the three provinces into which the Iberian peninsula was divided by Augustus. The Roman province occupied, like modern Portugal, the W. side of the peninsula, extending from Cape St. Vincent E. to the mouth of the Guadiana and N. to the Douro. It consequently did not include the N. provinces of Portugal, Minho and Trás os Montes. Eastward in the interior it extended far beyond the boundaries of Portugal, embracing the N. part of the old Spanish province of Estremadura and the S. part of Leon. The country of the Lusitani, however, was much smaller than the province to which its name was given. In this sense Lusitania included mainly the region between the Tagus and the Douro, from the Atlantic on the west to the present frontier of Portugal on the east. The province was anciently rich and fertile, and possessed valuable mines of gold and silver. Besides the Lusitanians, it contained several other tribes, of whom the most important were the Vettones, the Turduli Veteres, a branch of the Turdetani, and the Celtici, who were a remnant of the old Celtic population of the peninsula. The chief city of Lusitania was Olisipo, the modern Lisbon, which was always a place of importance, though the Romans made Emerita Augusta, the modern Merida, the capital of their province. The Lusitani, according to Strabo, were the greatest nation of the peninsula, and the one most frequently and longest at war with the Romans. They were a brave and turbulent race, and much addicted to brigandage, especially those who dwell among the mountains. They revolted in 153 B. C., and carried on for 14 years a gallant struggle against the Romans, who for a time were compelled to acknowledge their independence. Viriathus, who became their chief in 147, was finally assassinated by three of his own friends who had been bribed by the Romans, and the subjugation of the Lusitanians was soon afterward effected.

**LUSTRATION** (Lat. *lustratio*, also *lustrum*), purification by sacrifices or other ceremonies. Originally ablution in water was the only rite observed by the Greeks, but afterward sacrifices, &c., were added. They were employed both to purify individuals, cities, fields, armies, or states, and to call down the blessing of the gods. The most celebrated lustration of Greece was that performed at Athens, in the

days of Solon, by Epimenides of Crete, who purified that city from the defilement incurred by the Cylonian massacre. A general lustration of the whole Roman people took place every fifth year, before the censors went out of office. On that occasion the citizens assembled in the Campus Martius, and the sacrifices termed *suovetaurilia*, consisting of a sow, a sheep, and an ox, were offered up, after being carried thrice round the multitude. This ceremony, to which the name *lustrum* was particularly applied, is said to have been instituted by Servius Tullius in 566 B. C., and was celebrated for the last time at Rome in the reign of Vespasian. The term was also applied to the period which intervened between the *lustra*, and, as that period consisted of five years, later writers occasionally used the word *lustrum* to designate that space of time generally. All Roman armies were lustrated before they commenced military operations. The Roman shepherd at the approach of night adorned his fold with branches and foliage, sprinkled his sheep with water, and offered incense and sacrifices to Pales, the tutelary divinity of shepherds. Whatever was used at a lustration was immediately after the ceremony cast into a river, or some place inaccessible to man, as it was deemed ominous for any one to tread on it.

**LUTE**, a musical stringed instrument of the guitar species, formerly in general use, but long superseded by the harp and guitar. In shape it is not unlike the section of a pear. It is played like the guitar, and the music was written in tablature, but in so complex a manner that it is difficult to translate it into modern notation. It is supposed to be of eastern origin, and its invention has been ascribed to the Arabs.

**LUTE**, or **Luting** (Lat. *lutum*, clay), a soft adhesive mixture used in chemical operations for making tight the joints of an apparatus. Its ingredients vary according to the kinds of vapors to be confined, and the temperatures to which it is to be exposed. Fire-brick clay, finely pulverized and made into a paste with water, withstands the highest degrees of heat, and makes tight joints when carefully applied and gradually dried and baked. Fibres of asbestos are advantageously intermixed with the clay. Fat lute is very generally used where the temperature is not excessively high, and where the vapors to be confined are corrosive. It is made of pipe clay worked to a soft and ductile paste with linseed oil. It must be applied to perfectly dry surfaces, and may be strengthened by binding over it slips of bladder. Common putty may often be substituted for it. Hydraulic lime and plaster of Paris make very useful lutes for many purposes, especially when rendered impervious by washing them over with oil, or a melted mixture of equal parts of wax and oil. Caustic lime thoroughly worked into the white of an egg, laid on slips of cloth and thus applied over the



junctions to be luted, firmly adheres like a cement. White lead and oil laid on slips of cloth, and paste and paper, or glue and paper, and linseed meal made into a paste with water, milk, lime water, or weak glue, all serve as lutes for special operations.

**LUTHER, Martin**, the leader of the German reformation, born in Eisleben, now a town of Prussian Saxony, on St. Martin's eve, Nov. 10, 1483, died in the same place, Feb. 18, 1546. His father was originally a poor peasant, but became a miner, and ultimately acquired a house and two furnaces at Mansfeld, whither he removed six months after Luther's birth, and left at his death about 1,000 florins in money. The reformer was brought up under pious but severe and rough discipline. At school he was once flogged 15 times in a single forenoon. He calls the German schools of those days purgatories, and the teachers tyrants and taskmasters. While at school in Mansfeld he had to beg his bread with his companions by singing from house to house in the neighboring villages. "It is God's way," he says, "of beggars to make men of power, just as he made the world of nothing." His condition was not materially improved at the Franciscan school in Magdeburg, where he spent one year. From there he was sent to the Latin school at Eisenach, his favorite town. At first he had still to beg his bread by singing hymns in the street, and felt at times so discouraged that he nearly gave up study altogether. But a liberal lady, Ursula Cotta, took the poor boy, who had engaged her sympathy by his musical talent and earnest devotion in church, to her house, dispelling the gloom from his mind, and supporting him till he was prepared to enter the university of Erfurt in 1501 at the age of 18. Here he studied with great zeal and success the Latin classics and the scholastic (Aristotelian) philosophy, and graduated in 1505 as M. A. His moral conduct during all that time was unblemished. His father, who in the mean time was able to assist him, intended him for the legal profession. But the sudden death of an intimate friend in a duel, and his own narrow escape from death, first by a severe illness, and then by lightning, which struck with terrific force on the ground near his feet on the road between Erfurt and Stotterheim, so strongly excited his religious feelings and filled him with so vivid a sense of the vanity of the world, that he resolved to forsake it, and entered the Augustinian convent at Erfurt, July 17, 1505. Here he subjected himself to the severest monastic discipline and the humble services of sweeper, porter, and beggar. His deep mental conflicts, penances, and mortifications of the flesh seriously undermined his health and brought him to the brink of despair. The ascetic exercises led him more and more to a knowledge of his own moral helplessness, and to the cross of Christ as the only source of justification and peace. In this process he was greatly assisted

by the study of the Bible, complete copies of which he first found in the university library, and in the convent at Erfurt, by the writings of St. Augustine, his favorite among the fathers, the sermons of the German mystic Tauler, the commentaries of Nicholas de Lyra (hence the saying, *Si Lyra non lyrasset, Lutherus non saltasset*), and the advice of his fatherly friend Johann Staupitz, a practical mystic, and superior of the Augustinian order in Germany. The cloister of Erfurt may therefore be called the birthplace of Lutheran Protestantism and of the evangelical doctrine of justification by faith without the works of the law. "God ordered," says Luther, "that I should become a monk, that, being taught by experience, I might take up my pen against the pope." After having spent three years in the convent and taken orders (1507), Luther was called in 1508, at the instance of Staupitz, as professor of scholastic philosophy to the university of Wittenberg, which had been founded a few years before by Frederick the Wise, elector of Saxony. In 1512 he took the degree of D. D. He lectured on theology, especially the Psalms and the Epistles of Paul, his favorite apostle, freely expressed his dislike for the dry and stiff formalism of the prevailing scholasticism, and led the students from ecclesiastical tradition to the fresh fountains of the Scriptures, and to the evangelical system of his favorite St. Augustine. But he had no idea of being in conflict with the genuine spirit of Catholicity. On the contrary, when in 1510 he made a journey to Rome in the interest of his order, he devoutly ascended on his knees the *scala santa* opposite the church of St. John Lateran, although an inward voice, as he declares, repeated the passage, "The just shall live by faith." It required, however, only the proper external occasion to call out the reformation as it was fully prepared, not only in the mind of Luther, but for centuries past in the Latin church at large, both negatively and positively, by the anti-Catholic sects, and the movements of Wycliffe in England, Huss in Bohemia, Savonarola in Italy, Wessel and many others in Holland and Germany. This occasion was the abuses attending the promulgation of an indulgence under the authority of Pope Leo X. to all who, besides fulfilling other conditions, should contribute money for the rebuilding of St. Peter's at Rome. The person intrusted with the dispensation of these indulgences in Saxony was a Dominican monk named Tetzl, who seems to have discharged his functions in a manner which many devout Catholics regarded as profane. He went far beyond the received doctrine of the Roman canonists of the age, and made the granting of ecclesiastical remissions little if any better than an open sale. Against this profanation of holy things Luther raised a bold protest in the famous 95 Latin theses which he posted up on the doors of the Schlosskirche at Wittenberg, Oct. 31, 1517. He enclosed a copy of them to the archbishop of

Magdeburg, beseeching that prelate to put a stop to Tetzel's scandalous practices. These theses, although submitting the entire controversy to the decision of the pope, contained nevertheless the germ of the Protestant doctrines. They spread with the velocity of lightning through the press, now for the first time turned to account in a popular agitation, and kindled a fire throughout the Catholic world of Europe. A sharp controversy followed; the attempts of ecclesiastical diplomacy to compromise the difficulty through Cajetan and Miltitz failed; the Leipsic disputation (June-July, 1519), between Dr. Eck on the one hand and Carlstadt and Luther on the other, soon rekindled the fire and widened the breach. Luther hurled several violent and most effective pamphlets against Rome, especially his address to the German nobility (1520), and henceforth he hated and abhorred the whole system of Roman Catholicism as an anti-Christian despotism that held the church of God in captivity and obstructed the access of the believer to Christ. Thus he was led step by step, against his original intention, to a complete emancipation from the system in which he was educated. In all this crusade he was encouraged and supported by his university, his prince, and a large amount of growing popular sympathy, especially in the north of Germany. Leo X. was disposed at first to treat the whole controversy lightly, as a mere monkish quarrel between the Augustinians and Dominicans; but he felt himself compelled at last to issue, June 15, 1520, a bull of excommunication (if he should not recant within 100 days) against the dangerous German heretic, who by his pen had shaken the church and the empire to the very base. Luther, surrounded by his students and colleagues, committed the papal bull, together with the canon law and several books of Eck and Emser, to the flames (Dec. 10, 1520) before the Elster gate of Wittenberg, exclaiming: "As thou (the pope) hast troubled the Holy One of the Lord, may the eternal fire trouble and consume thee." This bold act was the fiery signal of an irrevocable separation from the Roman hierarchy. A few months afterward he was summoned by the young German emperor Charles V. before the diet of Worms; and in spite of the remonstrances of timid friends, he resolved to go, though "there were as many devils there as there are tiles on the roofs of the houses." On entering the city (where a magnificent monument to his memory was completed in 1868), more than 2,000 persons accompanied him to his quarters. When confronted with the brilliant assembly of the emperor, the princes and nobles of the empire, the dignitaries of the church, and an immense concourse of spectators, and called upon to recant, he boldly defended his doctrines, and made the memorable declaration (April 18, 1521): "Unless I shall be refuted and convinced by tes-

tic, clear, and evident arguments and reasons, I cannot and will not retract anything, since I believe neither the pope nor the councils alone, both of them having evidently often erred and contradicted themselves, and since it is neither safe nor advisable to do anything against the conscience. Here I stand, I cannot otherwise; God help me! Amen." Thus the Bible, his conscience, and private judgment were the three powers to which he appealed against tradition, the pope, and the councils. When the solitary monk entered the hall of the diet, Freundsberg, an able military commander, tapped him on the shoulder and justly said: "Monk, monk, thou art on a passage more perilous than any which I and many other commanders ever knew in the bloodiest battle fields. If thou art right, fear not; God will sustain thee." The diet subsequently pronounced the ban of the empire against Luther, and he was now an outlaw before church and state.—With Luther's appearance at Worms culminates his opposition to Rome, or the first and negative act of the reformation. The third period of Luther's life, which reaches from the diet of Worms to the diet of Augsburg (1530), embraces his positive labors in constructing and organizing the new church on the Scriptural basis, in opposition not only to papal authority, but also to ultra Protestant radicalism and fanaticism. On his return to Wittenberg he was protected by the agents of Frederick the Wise, and lodged in the castle of the Wartburg, near Eisenach in Thuringia. In this romantic solitude, which he called his Patmos, he spent ten months under the assumed name of "Master George," hunting, praying, issuing tracts, and translating the New Testament, until the outbreak of serious disturbances among his own followers induced him to return to Wittenberg (March, 1522), in spite of the remonstrance of his prince. He preached a series of sermons in favor of order, authority, moderation, and charitable forbearance, and thus allayed the radical movement, headed by his older colleague, the earnest but fanatical Carlstadt, which threatened to defeat the cause of the reformation by turning it into a chaotic revolution. He took a similar conservative stand against the Anabaptists and the political ultra Protestantism in the peasants' war, which rose like a dark pillar of smoke from the flame of the reformation, and ended in the more complete subjugation of the German peasantry by their temporal and spiritual masters. The cruel advice attributed to Luther to kill the rebellious peasants "without mercy like mad dogs" was at any rate executed, and the premature movement in favor of political freedom was suppressed in 1525. Since that time Protestantism in Germany has been strongly conservative and monarchical in politics, while in Switzerland, France, Holland, and England it has favored and promoted political liberty. In the midst of these disturbances Luther suddenly married, in his 42d

year (June, 1525), to the great surprise of his friends, an ex-nun, Catharina von Bora, in order "to please his father, to tease the pope, and to vex the devil." The marriage was upon the whole a happy one. Luther speaks of his "Katy" as an obedient, pious, and good wife, whom he prized "above the kingdom of France or the state of Venice." The most important labors of the reformer between 1521 and 1530 were his translation of the Bible, his sermons, hymns, and chorals for divine service in the vernacular tongue, his larger and shorter catechisms, both of which acquired symbolical authority, and his efforts in behalf of common schools and popular education. He defended the establishment of such schools, partly by taxation, partly by the funds of the monasteries, with the strongest and clearest arguments derived from the duty of parents and of the state, the Bible, and the highest considerations of public virtue and religion. "It is a grave and serious thing," he says, "affecting the interests of the kingdom of Christ and of all the world, that we apply ourselves to the work of aiding and instructing the young. . . . Why else do we elder persons live, but to take care of the young, to teach and train them? It is not possible that giddy childhood should provide for its own instruction. Therefore God has committed them to us who are old and have experience, and he will call us to a strict account. . . . This is not only the duty of parents, but also of the state and the church. How can reason and charity allow the youth to grow up uneducated to become a poison and pestilence, corrupting a whole town?" He regarded the office of a teacher, next to preaching, as the most important and useful vocation. "I am not quite sure which of the two is the better; for it is hard to reform old sinners, with whom the preacher has to do, while the young tree can be made to bend without breaking." It is necessary to add that he viewed domestic and public education always in close connection with religion and the church. In 1529 he attended the fruitless theological conference at Marburg to bring about a union between the Lutherans and Zwinglians, but declined the overtures of brotherhood made by the less rigid Swiss reformer, on account of the difference existing between them in their views on the Lord's supper. He claimed and exercised the full right of private judgment against bishops, popes, and general councils, but refused it to others who conscientiously differed from him, and had the same veneration for the Word of God as he. Born to rule and accustomed to lead opinion, he was impatient of contradiction and overbearing in disposition. During the diet of Augsburg in 1530, where the "Augsburg Confession," the most important symbolical book of the Lutheran church, was composed by Melancthon and presented to the emperor, Luther remained at the castle of Coburg, watching the progress of events, and encour-

aging his timid and often desponding friend Melancthon.—The fourth and last part of Luther's life, from 1530 to 1546, is less important for the general course of the Protestant movement, which in the mean time had far outgrown its individual and sectional proportions, and presents less biographical unity and interest to the general reader. He continued, however, his labors as professor, preacher, and writer, without interruption, and took a leading part in the public events of his country. In 1534 he completed the translation of the whole Bible, the work of many years. In 1536 he assented to a temporary agreement with the Swiss Protestants, but soon afterward renewed the sacramental war with great vehemence, and refused fellowship with all who denied his doctrine of the Lord's supper. In 1537 he drew up in a strongly anti-papal spirit the "Articles of Smalcald," intended for the often promised and long delayed general council. They were signed by the Lutheran princes and Melancthon (though with a qualifying clause by the latter), and became one of the symbolical books of the Lutheran church. He had no confidence in any compromise with Rome, and attended none of the conferences which vainly attempted to heal the great schism. In 1539 he committed the inexcusable mistake of giving his private though qualified consent to the disgraceful bigamy of Philip of Hesse. His latter years were frequently obscured by sickness, irritable temper, gloomy spirits, death of friends and relatives, dissatisfaction with public affairs, differences among his followers, and the warlike prospects of Germany. In December, 1544, he wrote to a friend: "I am worn out and discontented; that is, I am an old man and no more of any use. I have finished my course; there remains only that God gather me to my fathers and give my body to the worms." He complained bitterly of the rudeness, impiety, and immorality of his age. In 1545 he was so dissatisfied with the people of Wittenberg on account of their luxury and vain amusements, that he left the town to spend the remainder of his days elsewhere; but at the entreaties of the elector and the university he returned. His last work was the completion of a commentary on Genesis, which he commenced in 1535, and concluded in November, 1545, with the words: "I am weak and can do no more. Pray God that he may grant me a peaceful and happy death." In January, 1546, he left Wittenberg with his three sons, John, Martin, and Paul, to settle a quarrel between the counts of Mansfeld and some of their subjects whom they wished to deprive of their furnaces. He reached Eisleben in poor health, preached four times, communed twice, ordained two priests, wrote serious and humorous letters to "the profoundly learned lady Cath. Luth., his gracious housewife," and enjoyed the recollections of the place of his birth. His conversation in these days is said to have been unusually earnest, rich, and im-

pressive. The last related to death, eternity, and the recognition of friends in heaven. On Feb. 17 he was seized with a painful pressure at the breast, and after fervent prayer and thrice repeating to his friends the words, "Father, into thy hands I commit my spirit; thou hast redeemed me, thou faithful God!" he quietly died with folded hands, between 2 and 3 o'clock of the following morning. His remains were removed in solemn procession to Wittenberg, and deposited in the castle church near the pulpit. Bugenhagen and Melancthon preached the funeral orations and gave utterance to the universal grief of Protestant Germany over the departure of the Elijah of the reformation.—Luther's greatness is not that of a polished work of art, but of a lofty and rugged alpine mountain. Whatever he said and did, he said and did with all his might. His character is easily understood. Throughout his whole life he was an open-hearted, honest German. Dissimulation and cowardice were alike unknown to him. His virtues and faults lie on the surface, and we have nowhere to search for any secret or double motive in his conduct. He is the most faithful and original type of the German national character both in its strength and weakness. He was emphatically a man of the people, and to this day no other name carries such weight and authority with the masses in Protestant Germany, which reveres and loves him far more than Boniface, "the apostle of Germany." He gave to his countrymen in their native tongue, what no one did before or since, the first readable Bible and catechism, which have retained their place in church and school to this day. He had an extraordinary faculty of expressing the deepest thoughts in the plainest and most popular language, and many of his sayings have passed into proverbs. As a scholar and scientific divine he was inferior to Melancthon, and not to be compared with Calvin. He was no systematic thinker and logical reasoner, and his writings abound in paradoxes, inconsistencies, and contradictions. He always spoke out his first impressions and momentary convictions from the fulness of his mind and heart, regardless of consequences. Nor was he an organizing legislator and strict disciplinarian like Calvin. He contented himself with a reformation of the fundamental articles of faith, hoping that it would by its own force work out a reformation of conduct and public morals. He left the government of the church in the hands of the princes, who assumed and exercised the episcopal power. Some of his private habits, his love for wine and beer, his joviality and drollery, would have been regarded by the Geneva reformer as inconsistent with true Christian sanctity. Luther never acquired a control over his violent temper and fierce passions. His wrath discharged itself in thunder and lightning; and in his controversial works against the Roman Catholics, the Sacramentarians, Henry VIII. of England, and

Erasmus, he indulges often in rude and vulgar invectives which no writer of the present day could use without losing the reputation of a gentleman. But we must take into account his want of refined training, the character of his age, and the rough character of the work he had to perform. To use his own graphic language, he was "rough, boisterous, stormy, and altogether warlike, born to fight innumerable devils and monsters, to remove stumps and stones, to cut down thistles and thorns, and to clear the wild woods." And then it should always be remembered that beneath the strong armor of controversy Luther had a genial, kind, and generous heart. He never meant more than he said, and knew no revenge. A lion in public life, he was a lamb at home. He was eminently social in his disposition, a great lover of poetry and music, an affectionate husband and father. He liked to play with his children, and to gather with them in childlike joy around the Christmas tree. In his letters to his wife and friends he lays open his whole heart, and gives free vent to his native wit, harmless humor, and childlike playfulness and drollery. His "Table Talk," though by no means all genuine, is one of the most interesting and entertaining of books, a singular mixture of the wildest paradoxes, conceits, superstitions, and freaks of fancy, with good sense, sound views, and excellent advice. Like most men of genuine humor, Luther was serious at bottom, and often subject to mental gloom and melancholy, especially during his monastic life and his latter years. "The basis of his life," says Carlyle, "was sadness, earnestness. In his latter days, after all triumphs and victories, he expresses himself heartily weary of living; he considers that God alone can and will regulate the course things are taking, and that perhaps the day of judgment is not far. As for him, he longs for one thing: that God would release him from his labor and let him depart and be at rest. They understand little of the man who cite this in discredit of him! I will call this Luther a true great man; great in intellect, in courage, affection, and integrity; one of our most lovable and precious men. . . . A right spiritual hero and prophet; once more a true son of nature and fact, for whom these centuries, and many that are to come yet, will be thankful to heaven." The controlling element in Luther's character and the motive power of all his writings and actions was his piety, his strong faith in God and unbounded enthusiasm for the gospel. He was emphatically a man of prayer, and lived in the Scriptures as few men ever did. In the doctrine of the church and the sacraments, and in matters of worship, outward organization, and usages, he adhered much more closely to the traditions of the Roman Catholic system than either Zwingli or Calvin; but in what constitutes the essence of Protestantism he was as decided as any of his fellow reformers. The absolute supremacy of God's word, and justifi-

cation of free grace by faith alone, were the pillars of his theology and religion.—The works of Luther are partly in Latin, partly in German, and consist of sermons, commentaries on the Scriptures, especially on Genesis, the Psalms, and Galatians, polemical tracts against Roman Catholics, fanatics, Zwinglians, Erasmus, Henry VIII., &c., and a great many letters. He composed also a number of standard hymns and tunes, partly original, partly free versions and adaptations of Psalms and old Latin hymns; and he may be regarded as the founder of German church poetry and music, which is richer than that of any other nation. His most famous hymn is the *Ein' feste Burg ist unser Gott*, the war song of the reformation, written in 1529 on the basis of the 46th Psalm, and often rendered into English (by Carlyle, Mills, Miss Catharine Winkworth, Dr. Bunting, Massie, Heyl, and others). But his most important and useful work is his translation of the Bible, commenced in 1521, continued with the assistance of Melancthon, Bugenhagen (Pomeranus), and Cruciger, and completed in 1534. It threw all the previous German versions into entire forgetfulness, assisted immensely in the spread of the reformation, and in spite of its many obscurities and inaccuracies remains to this day in general use among the Protestant churches of the German tongue. It bears a similar relation to German literature to that which the common English version bears to English literature and church life. Though less accurate, it is a more gigantic work as to labor and perseverance, if we consider that it was made nearly a century earlier, before the appearance of many important grammars, dictionaries, and commentaries, and almost single-handed, while the English version is the product of the united labor not only of the 47 divines appointed by James I., but of three generations, as represented by Tyndale, Coverdale, Cranmer's Bible, the Geneva Bible, and the Bishops' Bible. Luther sometimes sat with his colleagues one and two weeks over a single obscure passage of the Hebrew Scriptures and the Latin Vulgate, and even employed butchers to dissect animals in his presence, that he might properly understand and accurately render the various sacrificial terms in the Levitical code.—We have six complete editions of Luther's works, of which the best are that of Walch (24 vols. 4to, Halle, 1740-'53) and the unfinished one of Plochmann and Irmischer (68 vols. 8vo, Erlangen, 1826-'57). The latter gives the works in their original Latin or German, and adds all the writings which had appeared since Walch. The best and cheapest selection of his works, containing all his more important writings, with instructive introductions and notes, is the one edited by Dr. Otto von Gerlach (last ed., 24 vols., Berlin, 1859). Dr. Barnas Sears has published, with valuable philological notes, "Select Treatises of Luther" (Andover, 1846). The letters of Luther, which furnish the most authentic materials for an

almost complete biography, were separately edited by De Wette (5 vols., Berlin, 1825-'8, to which a supplementary volume was added by Seidemann in 1856). The "Table Talk" was first collected by Aurifaber (1666), and then by Selnecker (1577); the best edition is by Förstemann and Bindseil (4 vols., Berlin, 1844-'8). It was translated into English by Bell (fol., London, 1652), and selections from it were made by William Hazlitt (London, 1848; new ed., enlarged, 1857). Of the very numerous biographies of Luther we mention those by Melancthon, *Historia de Vita et Actis Lutheri* (1546); Mathesius, *Historie von Dr. M. Luther's Anfang, Lehre, Leben und Sterben* (1565); Selnecker (1575); Keil (1746); Ukert (1817); Stange (1835); G. Pfizer (1836); Jürgens (1st division, 3 vols., 1846 *et seq.*); Meurer (1850-'52; 3d ed., 1870), to a great extent in Luther's own words; König and Gelzer (1851; English translation by Hare and Miss Winkworth, New York, 1857). The best work on the theology of Luther is by Julius Köstlin, *Luthers Theologie in ihrer geschichtlichen Entwicklung und ihrem inneren Zusammenhang dargestellt* (2 vols., Stuttgart, 1863). An exceedingly favorable judgment on Luther may be found in Döllinger's "Lectures on the Reunion of Christendom," delivered at Munich in 1872, which is all the more remarkable since the famous Catholic historian at an earlier period of his life, in a learned work entitled *Die Reformation* (3 vols., Ratisbon, 1846-'8), brought out very prominently the defects in Luther's character and theology. See also Heinrich Lang, *Martin Luther, ein religiöses Charakterbild* (Berlin, 1870). The French work of Audin, in 2 vols. (also translated into English), is written from a Roman Catholic point of view, and is upon the whole a caricature. The *Mémoires* by Michelet (Paris, 1857) are lively but superficial, and too much based upon the "Table Talk." The first volumes of Merle d'Aubigné's popular "History of the Reformation" are mostly occupied with Luther, and by their immense circulation have done more perhaps to spread a knowledge of his early life and labors in England and America than any other recent work. Of English and American writers, we must mention Thomas Carlyle, Coleridge, Archdeacon Hare (first in a very long note to his "Mission of the Comforter," afterward separately published, a most able vindication of Luther against the charges of Sir William Hamilton, Hallam, and others), and Barnas Sears ("Life of Luther, with special reference to his Youth," Philadelphia, 1850), as those who have best appreciated the character of the German reformer. Dr. Tulloch, also, in his "Leaders of the Reformation" (2d ed., Edinburgh, 1860), gives a highly eulogistic sketch of Luther. Prof. Fisher of Yale college devotes ample space to him in his "History of the Reformation" (New York, 1873). The hymns of Luther have been translated by R. Massie, and in part also by H. Mills, in



*Horæ Germanicæ*, and Catharine Winkworth in the two series of *Lyra Germanicæ*, republished in New York (1858). Of his commentaries, we have English translations of those on Genesis, the Epistle to the Galatians, and the first Epistle of St. Peter. But generally speaking the style of Luther, especially the German, is so thoroughly original, idiomatic, hearty, and characteristic, that it baffles the skill of the most experienced translators.

**LUTHERAN CHURCH.** The Lutheran church has been known by various titles. Her own earliest preference was for the name "Evangelical" (1525), and many of her most devoted sons have insisted on giving her this name without any addition. At the diet of Spire (1529) her confessors received the name of Protestants, which continued to be the diplomatic style of the church till the peace of Westphalia (1648), and which to a large extent in European usage is still confined to the Lutherans. In Poland and Austria her official title is "Church of the Augsburg Confession." The name Lutheran was first used by Eck when he published the bull against Luther, and was applied to all who took part against the pope. Luther strongly disapproved of the name, and the church, while tolerating it to avoid the confusion which would arise if it was laid aside, does so with a protest against the misapprehension the name might create, that she concedes to Luther any other position than that of a witness for the truth. As distinct on the one side from the Roman Catholic church, and on the other from the various other Protestant bodies, she is known as the "Evangelical Lutheran Church." I. DOCTRINE. In the three general creeds and in the unaltered Augsburg Confession (1530) the Lutheran church has a bond of her distinctive life throughout the entire world. As a further development of her doctrines, the larger part of the church recognizes the confessional character of the "Apology for the Confession" (1530), the larger and smaller catechisms of Luther (1529), the Smalcald articles (1537), and the *Concordiæ Formula* (1577), all which were issued together in 1580, with a preface signed by 51 princes and by the official representatives of 35 cities. The whole collection bore the title of the "Book of Concord." The fundamental doctrine of the Lutheran church is that we are justified before God, not through any merit of our own, but by his tender mercy, through faith in his Son. The depravity of man is total in its extent, and his will has no positive ability in the work of salvation, but has the negative ability of ceasing its resistance under the general influence of the Spirit in the Word and sacraments. Jesus Christ offered a proper vicarious and propitiatory sacrifice. Faith in Christ presupposes a true penitence. The renewed man co-works with the Spirit of God. Sanctification is progressive, and never reaches absolute perfection in this life. The Holy Spirit works through the Word and the sacra-

ments, which alone, in the proper sense, are means of grace. Both the Word and the sacraments bring a positive grace which is offered to all who receive them outwardly, and which is actually imparted to all who have faith to embrace it. Luther, in consequence of his rigid training in the Augustinian theology, had maintained at an earlier period a particular election, a view which he gradually abandoned. The views of Arminius himself in regard to the five points were formed under Lutheran influences, and do not differ essentially from those of the Lutheran church; but on many points in the developed system now known as Arminianism, the Lutheran church has no affinity whatever with it, and on these points would sympathize far more with Calvinism. The "Formula of Concord" touches the five points almost purely on their practical sides, and on them arrays itself against Calvinism rather by the negation of the inferences which result logically from that system than by express condemnation of its fundamental theory in its abstract form. In the United States the doctrinal test has varied in strictness in different synods, from an *ex animo* subscription to the whole body of symbols, down to the mere declaration, after the somewhat vague formula formerly recommended by the general synod, that "the fundamental doctrines of the Word of God are taught in a manner substantially correct in the doctrinal articles of the Augsburg Confession." But the tendency has been marked toward a clearer doctrinal position. The general synod in its revised constitution says: "We receive and hold, with the Evangelical Lutheran church of our fathers, the Word of God, as contained in the canonical Scriptures of the Old and New Testaments, as the only infallible rule of faith and practice, and the Augsburg Confession as a correct exhibition of the fundamental doctrines of the Divine Word, and of the faith of our church founded upon that Word." The general council in its "Fundamental Principles" declares: "We accept and acknowledge the doctrines of the unaltered Augsburg Confession, in its original sense, as throughout in conformity with the pure truth of which God's Word is the only rule. . . . The 'Apology of the Augsburg Confession,' the 'Smalcald Articles,' the catechisms of Luther, and the 'Formula of Concord' . . . are, with the unaltered Augsburg Confession, in the perfect harmony of one and the same Scriptural faith." The second of these forms gives the position of the great majority of Lutherans in the United States. The Evangelical Lutheran church regards the Word of God, the canonical Scriptures, as the absolute and only law of faith and of life. Whatever is undefined by its letter or its spirit is the subject of Christian liberty, and pertains, not to the sphere of conscience, but to that of order; no power may enjoin upon the church as necessary what God has forbidden or has passed by in silence, as none may forbid her

to hold what God has enjoined upon her, or to practise what by his silence he has left to her freedom. Just as firmly as she holds upon the one hand that the Bible is the rule of faith and not a confession of it, she holds on the other that the creed is a confession of faith and not the rule of it. The creeds are simply the testimony of the church to the truths she holds; but as it is the truth they confess, she of necessity regards those who reject the truth confessed in the creed as rejecting the truth set forth in the Word. While, therefore, it is as true of the Lutheran church as of any other that when she lays her hand upon the Bible she gives the command, "Believe!" and when she lays it on the confession, she puts the question, "Do you believe?" it is also true that when a man replies "No" to the question, she considers him as thereby giving evidence that he has not obeyed the command. —Very great misrepresentations have been made in regard to certain doctrines of the Evangelical Lutheran church, which it may be well to notice. No doctrine can be charged upon her as a church unless it is set forth or logically involved in a confession to which she gives a universal recognition. The only creeds which have this attribute are the œcumenical creeds and the Augsburg Confession. 1. *Baptism*. The Lutheran church holds that it is necessary to salvation to be born again of water and of the Spirit (John iii. 5, and Augsburg Confession, arts. ii. and ix.); but she holds that this necessity is ordinary, not absolute, or without exception; that the contempt of the sacrament, not the want of it, condemns; and that though God binds us to the means, he does not bind his own mercy by them. From the time of Luther to the present hour the Lutheran theologians have maintained the salvability and actual salvation of infants dying unbaptized. The rest of the doctrine of the Lutheran church, as a whole, is involved in her confessing with the Nicene creed "one baptism for the remission of sins," and that through it the grace of God is offered; that children are to be baptized, and that being thus committed to God they are graciously received by him. At the same time she rejects the theory of the Anabaptists, that infants unbaptized have salvation because of their personal innocence, and maintains that the nature with which we are born requires a change, which must be wrought by the Spirit of God before we can enter heaven (A. C., arts. ii. and ix.), and that infants are saved by the application of Christ's redemptory work, the ordinary medium of which application is baptism. 2. *Consubstantiation*. The charge that the Lutheran church holds this doctrine has been repeated times without number, although her theologians without a dissenting voice repudiate both the name and the thing, in whole and in every one of its parts. In the "Wittenberg Concord" (1536), prepared and signed by Luther and the other leaders in the church, it is said: "We deny the doctrine of

transubstantiation, as we do also deny that the body and blood of Christ are locally included in the bread." The "Formula of Concord" says: "We utterly reject and condemn the doctrine of a Capernaitish eating of the body of Christ, which after so many protestations on our part is maliciously imputed to us; the manducation is not a thing of the senses or of reason, but supernatural, mysterious, and incomprehensible. The presence of Christ in the supper is not of a physical nature, nor earthly, nor Capernaitish, and yet it is most true." It would not be difficult to produce ample testimony of the same kind from writers of other communions. Dr. Waterland, in his work on the doctrine of the eucharist, speaks thus: "As to Lutherans and Calvinists, however widely they may appear to differ in words and names, yet their ideas seem all to concentrate in what I have mentioned. The Lutherans deny every article almost which they are commonly charged with by their adversaries. They disown assumption of the elements into the humanity of Christ, as likewise augmentation and impanation, yea, and consubstantiation and concomitancy; and if it be asked at length what they admit and abide by, it is a sacramental union, not a corporeal presence." D'Aubigné says: "The doctrines (on the Lord's supper) of Luther, Zwingli, and Calvin were considered in ancient times as different views of the same truth. If Luther had yielded (at Marburg), it might have been feared that the church would fall into the extreme of rationalism. . . . Taking Luther in his best moments, we behold merely an essential unity and a secondary diversity in the two parties." 3. *Ubiquity*. The Lutheran church holds that the essential attributes of the divine and human natures in Christ are inseparable from them, and that therefore the attributes of the one can never be the attributes of the other. But a large part of her greatest theologians hold also that as his human nature is taken into personal union with the divine, it is in consequence of that union rendered present through the divine, wherever the divine is; that is, that the human nature of Christ, which as to its finite presence is in heaven, is in another sense everywhere present. "Our church rejects and condemns the error that the human nature of Christ is locally expanded in all places of heaven and earth, or has become an infinite essence." ("Formula of Concord," pp. 548, 695.) "If we speak of geometric locality and space, the humanity of Christ is not everywhere." "In its proper sense it can be said with truth, Christ is on earth or in his supper only according to his divine nature, to wit, in the sense that the humanity of Christ by its own nature cannot be except in one place, but has the majesty (of co-presence) only from the divinity." "When the word corporeal is used of the mode of presence, and is equivalent to local, we affirm that the body of Christ is in heaven and not on earth." "Of a local presence of the body of Christ in, with, or

under the bread, there never was any controversy between the Lutherans and Calvinists; that local presence we expressly reject and condemn in all our writings. But a local absence does not prevent a sacramental presence, which is dependent on the communication of the divine majesty." ("Colloquium of Mömpelgart," Tübingen, 1594.) 4. *The Lord's Day*. The Augsburg Confession touches on this subject only incidentally in connection with the question of church power. It teaches that the Jewish sabbath is abolished; that the necessity of observing the first day of the week rests not upon the supposition that such observance has in itself a justifying power, but on the religious wants of men. It teaches moreover that the Lord's day is of apostolic institution. The common judgment of the great theologians of the church has been that the sabbath was instituted at the creation of man; that the generic idea of devoting one day of the week to rest from labor and to religious duties pertains to the entire race through all time; and that the law of the sabbath, so far as it is not determinative and typical, is binding on Christians. ("The Lutheran Church and the Divine Obligation of the Lord's Day," by the Rev. C. P. Krauth, 1856.)—At times, especially in the early history of the Lutheran church, there arose controversies, the most important of which were: 1, the Philipistic, arising from the excessive desire of Melancthon and his school to harmonize with the Roman Catholics and the Reformed; 2, the antinomistic (1537-'40, 1556), caused by the effort of Agricola to introduce what has been called a "Pelagianism of the gospel;" 3, the Osiandrian (1550-'67), so called from Osiander, who confounded sanctification with justification; 4, the adiaphoristic (1548-'55) (see MELANCTHON); 5, the Majoristic (1551-'52), so called from Georg Major of Wittenberg, on the necessity of good works; 6, the synergistic (1555-'67), on the coöperation of the human will in conversion, in the course of which Flacius spoke of original sin as substantial, not accidental; 7, the Crypto-Calvinistic (1552-'74). The view of Bucer and the Strasburg school, which was adopted in part by Calvin in regard to the Lord's supper, was so much profounder than that of Zwingli (which Calvin strongly condemned), and indeed, in the aspect which it assumed in the Wittenberg Concord, so Lutheranizing, that Melancthon, without abandoning the Lutheran view, thought that the view of the Strasburgers might be tolerated, and the points of difference ignored in the confessions. This position was assailed by the stricter Lutherans. In the course of controversy the more general questions connected with the person of Christ were discussed. (See CRYPTO-CALVINISTS.) All these questions were settled in the "Formula of Concord" (1577-'80). So deeply was the church grounded in fundamental unity of faith, that none of these controversies, violent as some of them were, were able to rend it

into denominational fragments. The subsequent controversies have been on syncretism (1655), pietism (1686), and rationalism (1751), and those connected with the union and the revival of Lutheranism (from 1817, Harms's *Theses*, to the present hour).—Many learned writers of different denominations have found nothing in the doctrines or usages of Lutherans to prevent a union between them and other Protestants. Claude, one of the greatest theologians of the French Reformed church, says: "Those of the Augsburg Confession (who are called Lutherans) are in difference with us only about the point of the real presence, and about some questions of the schools which we cannot yet impute to their whole body; and as for the rest, they reject with us the invocation of saints, religious worship of images, human satisfactions, indulgences, purgatory, worship of relics, the public service in an unknown tongue, the merit of good works, transubstantiation, the sacrifice of the mass, the supremacy of the pope, the opinion of the infallibility of the church, and the principle of blind obedience to the decisions of councils. They acknowledge the Scriptures to be the only rule of faith; they carefully practise the reading of them; they own their sufficiency; they believe their authority, independent of that of the church; they distinctly explain the doctrine of justification, and that of the use of the law, and its distinction from the gospel; they do not conceive amiss of the nature of faith, and that of good works; and as for popular superstitions, we can scarce see any reign among them." ("Defence of the Reformation," 1673, translated by T. B., London, 1815, vol. i., p. 291.) II. DIVINE WORSHIP. The Lutheran church regards preaching as an indispensable part of divine service. All worship is to be in the vernacular, or at least in a tongue understood by those who use it; the wants of the heart as well as of the reason are to be met. Whatever of the past is spiritual, beautiful, and appropriate is to be retained. The church year, with its great festivals, is kept. With various national diversities there is a substantial agreement in the liturgical services of the Lutheran church throughout almost all the world. The hymns are sung by all the people with the organ accompaniment. The clergymen in their official functions wear a distinctive dress, usually a black robe, with the bands, though in portions of the church, as Denmark, Sweden, and Norway, the surplice and cope are retained, and the archbishop of Sweden wears the mitre and carries the crosier on solemn occasions. A preparatory service precedes communion. The doctrine and practice of auricular confession were rejected at the beginning. The "private confession," which was established in some parts of the church, involves no enumeration or confession of particular sins whatever, unless the communicant desires to speak of them; and the "private absolution" is simply the

annunciation of the gospel promise with the gospel conditions to the individual penitent. But as a prescribed form private absolution has either never been practised, or has ceased in most parts of the church, though its generic idea is carried out, informally at least, by all faithful pastors. The practice of exorcism in baptism, simply as a rite long established, and which might be tolerated if regarded merely as a symbolical representation of the doctrine that our nature is under the dominion of sin, was practised in parts of the church, but has fallen into oblivion. Persons are received to the communion of the church by confirmation performed by the pastor even in places where the episcopate is retained. "The Lutheran church," says the Rev. Dr. Schaff, "draws the fine arts into the service of religion, and has produced a body of hymns and chorals which, in richness, power, and unction, surpasses the hymnology of all other churches in the world." In the United States wider extremes in the mode of worship in the Lutheran church sometimes existed in a single locality than could be found within her whole communion in other parts of the world. This diversity has been deeply lamented, and earnest efforts are making with marked success to introduce greater uniformity of usage. The "Church Book" of the general council is the ripest of the results of these efforts, and on the recommendation of the council this edition of it, with music, arranged for the use of congregations by Harriet R. Krauth, has been largely introduced. The general synod in North America (South) and the general synod have also published books of worship, with the same tendency.

III. CONSTITUTION OF THE CHURCH. Many embarrassing circumstances prevented the Lutheran church from developing her life as perfectly in her church constitution as in her doctrines and worship. The idea of the universal priesthood of all believers at once overthrew the doctrine of an essential class distinction between clergy and laity. The ministry is not an order, but a divinely appointed office, to which men must be rightly called. No imparity exists by divine right; a hierarchical organization on the pretence of divine right is unchristian, but a gradation (bishops, superintendents, provosts) may be observed, as a thing of human right only. The government by superintendents and consistories has been very general, but the latest tendency has been to modify the consistorial constitution by the introduction of general synods. In Denmark Evangelical bishops took the place of the Roman Catholic prelates who were deposed. In Sweden the bishops embraced the reformation, and thus secured in that country an "apostolic succession" in the high-church sense; though, on the principles of the Lutheran church, alike where she has as where she has not such a succession, it is not regarded as essential even to the order of the church. The ultimate source of power is in the congregations, that

is, in the pastor and other officers and the people of the single communions. The right to choose a pastor belongs to the people, who may exercise it by direct vote, or through their representatives. Synods possess such powers as the congregations delegate to them. "Ministers are related to congregations, not as their servants, but as the servants of the church;" and even in the United States, where the congregational principle has been more radically developed than anywhere else in the Lutheran church, "the synod to which pastors belong has the entire jurisdiction over them." ("Formula of the Lutheran Church," ch. iii., §.) In the United States there are 51 synods. Of these, 9 are independent organizations, and the rest connected as follows: 20 with the general synod, founded in 1820; 5 with the general synod (South), founded in 1863; 11 with the general council, founded in 1867; and 6 with the synodical conference, founded in 1872. The total number of ministers is 2,500; of churches, 4,400; of communicants, 550,000. These statistics are based on the latest reports of 1873, with a small margin for known increase. Absolute ministerial parity is maintained, and lay representation is universal; but many vital points of church organization are unsettled. The constitutional powers of the synods are very few; and the feeling is increasing that a stronger and more centralizing government is needed.

IV. THEOLOGICAL SCIENCE flourished in the 16th century chiefly in the universities of Wittenberg, Leipsic, Tübingen, Strasburg, and Jena. To this era belong Luther, Melancthon, Flacius, Chemnitz, Brentius, and Chytræus. In the 17th century occur the names of Glassius, Pfeiffer, Erasmus Schmidt, Hakspan, Geier, Seb. Schmidt, Calovius; in dogmatics, Hutter, Gerhard, Quenstedt, Calixtus, Hunnius; in church history, Rechenberg, Ittig, Sagittarius, Seckendorf, and Arnold. In the 18th century, Löscher closes the ancient school, and the pietistic school, practical rather than scientific, is illustrated by Spener, Francke, and Lange. The conservative pietistic, avoiding the faults of the others and combining their virtues, embraces Hollazius, Starck, Buddeus, Cyprian, J. C. Wolf, Weismann, Deyling, Carpov, J. H. and C. B. Michaelis, J. G. Walch, Pfaff, Mosheim, Bengel, and Crusius. The school which treated theology after the philosophical method of Wolf includes S. J. Baumgarten, Reinbeck, and Carpov; to the transitional school belong Ernesti, J. D. Michaelis, and Semler, who prepared the way for rationalism; the principal members of the rationalistic school were Griesbach, Koppe, J. G. Rosenmüller, Eichhorn, Gabler, Bertholdt, De Wette, Henke, Spittler, Eberhard, and A. H. Niemeyer. Of the supranaturalistic school, abandoning the ancient orthodoxy in various degrees, but still maintaining more or less of the fundamentals of Christianity, are Morus, Döderlein, Seiler, Storr, Knapp, Reinhard, Lilienthal, and Köp-

pen; and in church history, Schröckh, C. W. F. Walch, Stäudlin, and Planck. The founder of the mediating theology of the 19th century was Schleiermacher (died 1834), the greatest of the advocates of the union between the Lutheran and Reformed churches of Germany. (See UNITED EVANGELICAL CHURCH.) Neander may be classed as pietistic supranaturalist, De Wette as historico-critical rationalist, Hase as philosophico-æsthetic rationalist. The chief defenders of common rationalism are Röhr, Paulus, Wegscheider, Bretschneider, and Ammon in his earlier writings; of historico-critical rationalism, Winer, Fritzsche, Credner, Schulz, Von Cölln, Gesenius, Tuch, Knobel, Hupfeld, Hitzig, Ewald, Bertheau, and Lengerke. The rational supranaturalistic school is represented by Tzschirner, Tittmann, C. F. K. Rosenmüller, and Baumgarten-Crusius; supranaturalism proper, or suprarationalism, by E. G. Bengel, Flatt, Heubner, Augusti, Hahn, Böhmer; pietistic supranaturalism by Tholuck (who approached more closely at a later date to a thoroughly Lutheran position), Hengstenberg, Olshausen, Stier, Hävernick, Steiger, and Bunsen in his early position, though subsequently rationalist. The representatives of the "new" or "German" theology, of the school of Schleiermacher, of Lutheran origin, are Lücke, Nitzsch, Julius Müller, Ullmann, Twesten, Dörner, Liebner, and Martensen; also Rothe, I. T. Beck, Auberlen, Umbreit, Bleek, H. A. W. Meyer, Huther, Wieseler, and Tischendorf. The writers of the 19th century whose names we have given are or were within the "Union," and defenders of it, with a few exceptions. The representatives of the Lutheran theology, for the most part, in its strictest sense, are Claus Harms, who struck the first decisive blow at rationalism (1817), Scheibel, Sartorius, Rudelbach of Denmark (one of the most learned of the orthodox theologians of our time), Guericke, Harless, Höfling, Thomasius, Philippi, Harnack, Kahnis in his earlier writings, Dieckhof, Löhe, Vilmar, Krabbe, Kliefoth, J. C. K. von Hoffmann (who departed from the received view of the atonement), Delitzsch, M. Baumgarten, Luthardt, Drechsler, Caspari, Oehler, Keil, and J. H. Kurtz. Two distinguished jurists, K. F. Göschel and F. J. Stahl, are to be included among the defenders of the Lutheran confession. In the United States the energies of the best men of the church have been directed mainly into the channels of practical activity; yet there has nevertheless been an honorable exhibition of theological ability and learning. Among the most prominent Lutheran theological writers are S. S. Schmucker, one of the principal authors and defenders of the "eclectic or American Lutheran system;" C. Philip Krauth, the first president of Pennsylvania college, and senior editor of the "Evangelical Review" (quarterly) in its earlier volumes; and C. F. Schaeffer. B. Kurtz, C. F. W. Walther, Prof. M. L. Stöver, J. W. Mann, Lape, Van Al-

stine, Harkey, Oswald, and Anspach have written valuable practical works; and Strobel and Weiser have furnished popular history and biography. J. G. Morris has an extensive reputation as a translator and elaborator of some of the best German religious fictions, and as a successful occasional writer. C. W. Schaeffer is the author of the best history of early Lutheranism. Krotel has translated the "Life of Melancthon." J. A. Seiss, H. I. Schmidt, T. Stork, W. Passavant, J. Fry, S. S. Sprecher, F. W. Conrad, S. and G. Fritschel, E. Greenwald, M. Loy, W. F. Lehmann, A. Spaeth, C. D. Bernheim, and J. Bachman also deserve mention. There are six publication establishments, two English, three German, and one Swedish. The Lutheran periodicals in the United States are: English, 13; German, 22; Norwegian, 7; Swedish, 5; Danish, 1. V. EDUCATION. The early efforts of Luther in behalf of education (see COMMON SCHOOLS, vol. v., p. 157, and EDUCATION, vol. vi., p. 413) were continued by his successors through the means of catechetical instruction, congregational and public schools, and universities. There are no exclusively Reformed universities in Germany proper. The universities which the Lutheran church has in part or in whole may be classified as follows: 1, those in which the three confessions are represented—Tübingen, Gießen, Breslau, and Bonn; 2, the two confessions, Lutheran and Reformed—Heidelberg, Greifswald, Marburg, Königsberg, Halle, Erlangen (the professors Lutheran with one exception), and Berlin; 3, exclusively Lutheran—Leipsic, Rostock, Jena, Kiel, and Göttingen; in Denmark, Copenhagen; in Norway, Christiania; in Sweden, Lund and Upsal; in Russia, Dorpat. In the United States the Lutheran church has 17 colleges, 15 theological seminaries, 17 academies, 7 female seminaries, and a great number of congregational schools. VI. EARLY MISSIONS. In 1559 Gustavus Vasa of Sweden founded a mission among the Laplanders, which was continued with renewed earnestness by Gustavus Adolphus, Denmark also aiding. Thomas von Westen (died 1727) was the apostle of this mission. Heyling of Lübeck, without any aid, labored as a missionary in Abyssinia (1635), and others, of the circle of his friends, engaged in the same cause in various parts of the East. Frederick IV. of Denmark established the East India mission at Tranquebar (1706), for which Francke furnished him two devoted laborers, Plützschau and Ziegenbalg, the latter of whom translated the New Testament into Tamil (1715). The labors of this mission were also extended to the English possessions. From the orphan house at Halle went forth a succession of missionaries, among whom Schwartz (died 1798) is preëminent. An institution for the conversion of the Jews was established at Halle in 1728. Egede (died 1758) of Norway commenced his labors in Greenland in 1721. In 1736 he returned, and established in Copenhagen a mission semi-



nary. The mission established by L. Harms in 1849, the Leipsic mission, and various other active and useful societies in every part of the Lutheran church, attest its continued missionary life. The idea of union in the practical work of religion among Christians of different creeds originated with Urlsperger of Augsburg (1780).—The number of members of the Lutheran church throughout the world is estimated at more than 40,000,000. Of the 25,000,000 of Protestants in the German empire, 20,000,000 at least are Lutherans. Austria had in 1870 a Lutheran population of 1,365,000; in the three Scandinavian kingdoms, the population of upward of 7,500,000, and in Finland the population of 1,800,000, are almost entirely Lutheran. In Holland are 72,000 Lutherans, and in Russian Poland 240,000. The Baltic provinces of Russia are almost entirely Lutheran. Russia, exclusive of Poland and Finland, has a Lutheran population of 1,900,000 souls. France has 700,000 Lutherans. In the United States the number of communicants (about 550,000) would in a moderate estimate imply a total population of not less than 3,000,000. There are large numbers of Lutherans in Australia.—See Göbel, *Die religiöse Eigenthümlichkeiten der lutherischen und der reformirten Kirchen* (Bonn, 1837); A. G. Rudelbach, *Reformation, Lutherthum und Union* (Leipsic, 1839); M. Schneckenburger, *Vergleichende Darstellung des lutherischen und reformirten Lehrbegriffs* (Stuttgart, 1855); F. J. Stahl, *Die lutherische Kirche und die Union* (2d ed., Berlin, 1860); L. F. A. Kahnis, *Principien des Protestantismus* (Leipsic, 1865), and *Gang des deutschen Protestantismus* (3d ed., 1874); J. A. Seiss, *Ecclesias Lutherana* (Philadelphia, 1868); C. P. Krauth, "Augsburg Confession, with Introduction and Notes" (Philadelphia, 1868), and "The Conservative Reformation and its Theology, as represented in the Augsburg Confession and in the History and Literature of the Evangelical Lutheran Church" (1871).

**LÜTKE, Feodor Petrovitch**, a Russian traveller, born in 1797. He early entered the navy, and accompanied Golovnin in his explorations of Nova Zembla (1817-'19), and Staniukovitch in circumnavigating the globe (1826-'9). Subsequently he became instructor of the grand duke Constantine Nikolayevitch, and rose to the rank of vice admiral in 1843. In 1845 he promoted the establishment of the geographical society, of which he was several times vice president. He was governor of Revel from 1850 to 1853, and afterward of Cronstadt, and became in 1855 a member of the council of state, with the full rank of admiral. In 1864 he succeeded Bludoff as president of the academy of sciences. His principal works are: "Four Journeys through the Northern Arctic in 1821-'4" (St. Petersburg, 1828; German translation by Erman, Berlin, 1835), and a narrative of his journey round the world, including his discovery of three new groups of

islands, which, after the name of his ship, he called the Seniavin islands (3 vols., St. Petersburg, 1834-'6; French translation, 3 vols., Paris, 1835-'6).

**LUTON**, a town of Bedfordshire, England, on the Lea, 26 m. N. W. of London; pop. in 1871, 17,317. It has a fine Gothic church, a national school, a union workhouse, and manufactories of straw hats. Luton Hoo Park, formerly the seat of the marquis of Bute, is in the vicinity.

**LÜTZEN**, a town of Prussian Saxony, 10 m. S. W. of Leipsic; pop. in 1871, 2,649. It is noted in history as the scene of the battle fought Nov. 6 (new style 16), 1632, between Gustavus Adolphus and Wallenstein, in which the Swedish king lost his life, his army being victorious; and of another (May 2, 1813) between Napoleon and the allied Russians and Prussians, in which the allies after a temporary success were defeated, losing 10,000 men, but no standards, while the French lost 12,000 men.

**LÜTZOW, Ludwig Adolf Wilhelm**, baron, a Prussian general, born May 18, 1782, died in Berlin, Dec. 6, 1834. He was celebrated as the leader of a corps of soldiers, chiefly composed of young noblemen, organized in 1813 against the French. It was called after him *Lützow'sches Freicorps*, and more generally the black huntsmen (*schwarze Jäger*). Körner was a member of this corps.

**LUVACK**. See PARADOXURUS.

**LUX, Adam**, a German enthusiast, born at Obernburg, Bavaria, in 1766, executed in Paris, Nov. 4, 1793. He was the son of a farmer, and studied medicine, but did not practise on account of his repugnance to surgical operations, and was for some time a teacher at Mentz. He became an ardent partisan of the French revolution, and after the occupation of Mentz by French troops was elected to the Rhenish-German convention, and deputed by that body in March, 1793, to represent it, together with Georg Forster, in the French convention. He subsequently conceived a romantic feeling of admiration for the Girondists, and made himself conspicuous by his eagerness to become a martyr in their cause. After their downfall he published a violent manifesto, *Avis aux citoyens*, against the terrorists, whom he challenged to imprison or to guillotine him. The execution of Charlotte Corday aroused his enthusiasm to the highest pitch, and he published a pamphlet extolling her heroism, and again asked as a favor to be put to death. His demonstrations became so violent that his request was granted, and he perished on the guillotine. One of his daughters inherited his idiosyncrasies, and killed herself because she had fallen in love with Jean Paul Richter, whom she knew only by his writings, and who had remained indifferent to her passionate letters.

**LUXEMBOURG, François Henri de Montmorency-Bouteville**, duke de Luxembourg-Pineî, a French soldier, born in Paris, Jan. 8, 1628, died Jan. 4, 1695. He was the posthumous son of François de Montmorency, count de Bouteville.

(See *BOUTEVILLE*.) At an early age he was introduced at court by his aunt, the princess de Condé. Under the great Condé he first saw service at the siege of Lérída; and for his gallantry at the battle of Lens, although then but 20 years of age, he received from Anne of Austria the appointment of *maréchal de camp*. Throughout the war of the Fronde he adhered to his commander, with whom he joined the Spaniards and fought against his countrymen until the peace of the Pyrenees. About this time he was married to Madeleine, heiress and representative of the dukes of Luxembourg-Pinei, a title which he thereupon assumed. At the breaking out of war with Spain in 1667 he joined the army of Turenne as a volunteer, and in the succeeding year, in the capacity of lieutenant general, aided Condé in the conquest of Franche-Comté. In the campaign of 1672 he held chief command in Holland, and at Grool, Deventer, Zwolle, and other places showed himself a skilful general. The statement of the Dutch historians, that before taking the field he encouraged his troops to commit the grossest excesses, is deemed unworthy of credit. He ended this campaign by a brilliant retreat with 20,000 men in the face of an army of 70,000. He fought under Condé at the battle of Senef in 1674, and in 1675, after the death of Turenne, was appointed a marshal of France. His first operations in this capacity were unfortunate, but he soon captured Valenciennes and Cambrai, aided in gaining the battle of Cassel near St. Omer, forced the prince of Orange to raise the siege of Charleroi, and, when surprised by the latter at St. Denis near Mons, while negotiations for peace were in progress, conducted his retreat with skill. During the long peace which succeeded the treaty of Nimeguen he was accused of participating in the plots of Brinvilliers and Voisin, and of attempting to poison his own wife. To prove his innocence he voluntarily surrendered himself a prisoner at the Bastille, where he was confined for 14 months. Released in 1680 with an unspotted character, he was nevertheless forbidden to reside within 20 leagues of Paris. After 10 years of disgrace he was appointed by Louis to command the army destined for the invasion of Flanders, and in the campaign of 1690 defeated the prince of Waldeck at Fleurus. He was equally successful at Leutze and Steenkerk in 1692, and in 1693 defeated William III. in the battle of Neerwinden. His last great military act was his retreat before a superior force through Flanders to Tournay.

**LUXEMBURG** (Fr. *Luxembourg*), a territory of Europe, now constituting the southernmost province of Belgium and a detached dependency of the Netherlands (but ranking as an independent grand duchy), bounded E. by Rhenish Prussia and S. W. by France; area, 2,705 sq. m.; pop. in 1871, 403,312. It is traversed by branches of the Ardennes highlands, and watered by the Moselle and by affluents of the Meuse. It was originally called Lützelburg,

and was governed for some generations by German princes, whose progenitor was Count Sigfried of the Ardennes. It subsequently became a possession of the counts of Limburg, one of whom assumed the name of count of Luxemburg. To this house belonged the emperors Henry VII., Charles IV., son of King John of Bohemia, Wenceslas, and Sigismund, in the 14th and 15th centuries, all of whom but the first also reigned in Bohemia. Charles IV. elevated Luxemburg to the rank of a duchy. Wenceslas gave it to his niece Elizabeth, who ceded it to Philip the Good of Burgundy. With Mary, the daughter of Charles the Bold, it came into the hands of Maximilian of Austria. Philip II. of Spain received it from his father, the emperor Charles V. By the peace of Utrecht in 1713 it was restored to Austria, and in 1794-'5 it was conquered by France. In 1815, at the congress of Vienna, it was made a member of the German confederation, as a grand duchy, and the king of the Netherlands was selected as its ruler, under the title of grand duke of Luxemburg. In consequence of the revolution of 1830 Luxemburg was divided between Belgium and Holland, but the latter retained little beyond the fortress of Luxemburg, until April 19, 1839, when a new treaty was signed in London, by which Belgium resigned a portion of Limburg, to be united with the part of the king of Holland, as a member of the German confederation. The territory abounds so much with woods and forests, that under the French administration it was appropriately called *département des Forêts*. Agriculture flourishes to some extent in the lower part of the country, and wine of an inferior quality is produced along the banks of the rivers.—The present Belgian province of Luxemburg forms the S. E. division of the kingdom, bounded N. and W. by Liège and Namur, and comprises the arrondissements of Arlon, Bastogne, Marche, Neufchâteau, and Virton, including the old duchy of Bouillon; area, 1,706 sq. m.; pop. in 1871, 205,784. The great Luxemburg railway from Brussels to Treves traverses the whole province. The industry of Belgian Luxemburg comprises iron works, slate quarries, potteries, tanneries, cloth factories, and paper mills. Capital, Arlon.—The grand duchy of Luxemburg lies E. of the Belgian territory, and is bounded S. by the German Reichsland of Alsace-Lorraine; area, 999 sq. m.; pop. in 1871, 197,528, nearly all Roman Catholics. All the inhabitants are of German nationality, with the exception of two villages on the Belgian frontier, which are Walloon. The number of persons who exclusively speak French is estimated at about 4,000; all the others speak German. The grand duchy is divided into the districts of Luxemburg, Diekirch, and Grevenmachers. The principal manufactures are iron, leather, gloves, porcelain, and earthenware; there are also some textile manufactures, nearly 2,000 distilleries, and a large num-

ber of breweries. Luxemburg is a representative monarchy, the king of the Netherlands being the grand duke and sharing the legislative functions with a diet which consists of 40 deputies, elected in 13 electoral districts by a direct vote for a term of six years. Every third year one half of the members are elected. The chamber meets annually and elects its own president and vice presidents. The grand duke is represented by a prince of his family, who bears the title of stadtholder; and a special secretary for the affairs of the grand duchy is employed in the royal cabinet at the Hague. The highest administrative board is the "government," in the city of Luxemburg, consisting of a president and three directors general. The revenue in 1871 amounted to \$1,064,000, the expenditure to \$988,000. The public debt, exclusively consisting of railroad loans, amounts to about \$2,280,000. The armed force numbers about 500 men. The aggregate length of railroads is about 105 m. The king of the Netherlands was by virtue of this possession a member of the German confederation, had a vote in the diet, and furnished for Luxemburg and Limburg a contingent of about 8,000 men to the federal army; but in 1866 the dissolution of the confederation put an end to the connection of Luxemburg with Germany. The state of public affairs in the duchy for some time gave rise to serious complications, the German diet having authorized the king in 1839 to rule it according to the political principles which prevail in other parts of the Netherlands, while the Luxemburgers demanded a more liberal form of government. Hassenpflug, the minister in Luxemburg, was at length compelled to resign in 1840. After the accession of King William II. some privileges were granted to the grand duchy (Oct. 12, 1841), and in 1842 it joined the German Zollverein. Until 1848, however, the country was agitated by political and religious strife, in which the Roman Catholic bishop Laurent took a conspicuous part. The revolution of 1848 put an end to this agitation, and introduced parliamentary government, which however has since been modified. The conflict between the liberal and the government party ended in 1858 in favor of the latter, and the royal civil list was raised in the same year from 100,000 to 200,000 francs. In 1867 Napoleon III. entered into secret negotiations with the king of the Netherlands for the sale of the grand duchy, and an agreement would have been arrived at but for the protest of the North German confederation, which, supported by the South German states, notified France that the transfer of the grand duchy to that power would be opposed if necessary by force of arms. In order to find a peaceable solution for the threatening complication, a conference of the powers which had signed the treaty of 1839 met in London on May 7, 1867, which on May 11 agreed upon the following treaty: "Luxemburg remains with the house of Nassau-Orange, and forms for ever a

neutral state, which is placed under the joint guarantee of all the signers of the treaty with the exception of the neutral Belgium. The grand duchy continues to belong to the German customs union; the fortress is evacuated by the Prussian troops, razed by the king of the Netherlands, and cannot be restored."

**LUXEMBURG**, a city, capital of the grand duchy of Luxemburg, on the Elze or Alzette, 76 m. S. S. E. of Liège; pop. in 1871, 14,440. Its situation has been frequently compared with that of Jerusalem; it is completely surrounded by high escaped rocks. The upper town occupies a plateau, joined to the neighboring country only on the west. On the other three sides are precipices nearly 200 ft. deep. Similar rocks rise opposite to these, enclosing a valley, in whose depths the lower town nestles. The communication between the upper and lower towns is by flights of steps, or by streets carried up in zigzags, so as to make them passable for carriages. The fortifications of Luxemburg, which gave the town a remarkably picturesque appearance, were successively increased and improved by the Spaniards, Austrians, French, and Dutch, and entirely repaired and much strengthened after 1830 by the German diet, but were razed in 1867 and the following years, in accordance with the stipulation of the treaty of London. The most remarkable part of the fortifications was that called *Le Bouc*, a projecting headland of rock, hollowed out from top to bottom, and commanding with its loopholes and embrasures the valley up and down; its casemates resembled those of Gibraltar. Carnot declared Luxemburg to be "the strongest fortress in Europe, next to Gibraltar; the only point for an attack upon France from the direction of the Moselle." In spite of its strength, however, none of the many sieges of Luxemburg was particularly remarkable. It was one of the principal fortresses of the German confederation, and garrisoned by 6,000 Prussian troops. Luxemburg has a fine cathedral and other churches, and various public institutions. The industry is carried on in the lower town, where are many mills, dye works, and manufacturing establishments. An international bank with a capital of 40,000,000 francs was established here in 1856. The great Luxemburg railway connects it with Brussels and Treves, and diligences with Metz, the journey to the latter city leading over some of the most favorite hunting grounds and the wildest regions of the Ardennes.

**LUXOR.** See THEBES.

**LUYNES, Honoré Théodoric Paul Joseph d'Albert**, duke de, a French archæologist, born in Paris, Dec. 15, 1802, died in Rome, Dec. 14, 1867. He was descended from the elder branch of the ancient family of Albert, which assumed alternately the names of Luynes and Chevreuse, from an intermarriage in 1622 of Claude de Lorraine, one of the early lords of the town of Chevreuse, with the widow of Charles d'Albert, duke de Luynes, the latter a constable of

France, who was mainly instrumental in the overthrow of the adventurer Concini (see ANCRE, MARSHAL D'), and superseded him in the favor of Louis XIII. His father was one of the richest landed proprietors of France. His mother was Mme. de Chevreuse (1785-1813), whom Napoleon banished from the court on account of her bold comments on the imperial régime. At the interposition of Talleyrand she was afterward permitted to return, and was even appointed lady in waiting to Josephine; but she did not conceal her dislike of the emperor, and refusing his order to escort the captive queen of Spain to France, on the ground that she would not perform the function of a jailer, she was again expelled from Paris, as were Mme. Récamier and Mme. de Staël. After the banishment of his mother, young Chevreuse, or De Luynes, as he afterward signed his name, was educated by his grandmother Mme. de Luynes, and spent seven years in the military service. His attention was turned to archaeological studies by the discovery in Italy, on an estate belonging to him, of the remains of the Greek city Metapontum. After the revolution of July, 1830, he equipped at his own expense the national guard of Dampierre, and evinced his readiness to make further pecuniary sacrifices for the support of the government, but refused to take his seat in the legislature. In 1848 he became a member of the constituent assembly, and in 1849 of the legislative assembly. He was opposed to the republican party, and also hostile to Louis Napoleon, and was imprisoned for a short time after the *coup d'état* of Dec. 2, 1851. He was a generous patron of art and artists, collected at his manor of Dampierre a remarkable gallery of works of art, was admitted in 1830 to the institute as a free member of the academy of inscriptions and belles-lettres, and was appointed in 1854 to superintend the long projected catalogue of the imperial library, to which in 1862 he presented his collection of coins and medals. In 1864 he made an archaeological and scientific tour in Syria and Palestine, an account of which was published after his death, by his grandson, under the direction of Count de Vogüé: *Voyage d'exploration à la Mer Morte, à Palmyre, à Petra, et sur la rive gauche du Jourdain* (3 vols. 4to, Paris, 1871, relating to history and geography; a 4th volume, on geology, mineralogy, and palæontology, is to be added by Louis Lartet). Among the other works of De Luynes are: *Études numismatiques* (1835); *Metaponte, in concert with Debaeq* (1836); and *Choix de médailles grecques* (1840).

**LUZAC, Jean**, a Dutch philologist, born in Leyden, Aug. 2, 1746, killed by an explosion of gunpowder in the port of Leyden, Jan. 12, 1807. He was of a French Protestant family, was educated for the bar at the Hague, and in 1772 became one of the editors of the "Leyden Gazette," a journal of European reputation, controlled since 1738 by his father and

uncle. For a number of years subsequent to 1775 he was its sole editor, in which capacity he became known as a friend or correspondent of Washington, Adams, Jefferson, and of many eminent Europeans. He was afterward Greek professor at the university of Leyden, and in 1795 published an address *De Socrate Cive*, dedicated to John Adams, whose son, John Quincy Adams, had studied under his direction. During the revolutionary troubles in Holland he was forbidden to lecture on Greek history; and having refused to obey this injunction, he was deprived of his professorship, which was however restored to him in 1802 with an increase of salary. Upon being suspended from his professional functions, he received a letter from Washington, expressing sympathy in his behalf. His *Lectioes Atticæ*, a defence of Socrates, was published in 1809.

**LUZERN.** See LUCERNE.

**LUZERNE**, a N. E. county of Pennsylvania, intersected by the north branch of the Susquehanna river, and also drained by the Lackawanna, Nescopeck, Huntingdon, and Wapwallopen creeks; area, 1,427 sq. m.; pop. in 1870, 160,915. The surface is mountainous, but diversified by many beautiful and fertile valleys, among which is that of Wyoming. It is traversed by several ridges of the Alleghanies and the Wyoming and Moosic mountains. It contains very rich and extensive coal fields. A branch of the state canal and several important railroads pass through it. The chief productions in 1870 were 104,297 bushels of wheat, 115,339 of rye, 368,537 of Indian corn, 475,988 of oats, 197,160 of buckwheat, 573,322 of potatoes, 38,555 lbs. of wool, 1,068,565 of butter, and 58,145 tons of hay. There were 7,431 horses, 12,306 milch cows, 9,210 other cattle, 12,051 sheep, and 10,430 swine. There were 886 manufacturing establishments, having \$9,380,270 capital, and an annual product of \$17,493,463; the most important were 39 manufactories of carriages, 5 of cars, 58 of clothing, 24 of furniture, 4 of gas, 3 of gunpowder, 23 of iron, 18 of machinery, 24 of saddlery and harness, 30 of tin, copper, and sheet-iron ware, 20 of cigars, 21 tanneries, 10 currying establishments, 3 distilleries, 7 breweries, 30 flour mills, 7 planing mills, and 74 saw mills. Capital, Wilkesbarre.

**LUZON**, or **Luçon**, an island in the Pacific, belonging to Spain, the largest and most important of the Philippine archipelago, lying between lat. 12° 30' and 18° 46' N., and lon. 119° 50' and 124° 10' E., separated from the island of Samar by the narrow strait of San Bernardino; length N. W. to S. E. 520 m., greatest breadth E. and W. 140 m.; area, about 40,000 sq. m.; pop. about 4,500,000. The island consists of two divisions, connected by an isthmus not more than 10 m. wide, and the northern of which is much the larger. The coast line of the northern division is in general very regular, except where indented by the bay of Davilican on the east, and the gulf

of Lingayen and the bay of Manila on the west. The coast line of the southern division is broken here and there by numerous bays and inlets, the principal of which are the Bahía de San Miguel and the Seno de Albay on the north, and the Seno de Ragay and others on the south. The face of the country is very mountainous; two chains, the Caravillos on the east and the Sierra Madre on the west, both of volcanic origin, traverse the whole of the northern division, with little interruption on either side; the mean elevation of both systems is about 4,000 ft. above the sea, and nowhere exceeds 7,000 ft. These chains unite southward, and trend along the isthmus in a single ridge of inconsiderable height; but the southern division is roughened by numerous hills and volcanic peaks. Among the principal volcanoes at present in activity in the island are Mayon in the southwest, an eruption of which destroyed the town of Malinao, and injured Albay and four other towns, in 1766, and in 1814 completed the ruin of Albay; Bulusan, at the extreme south, which serves as a beacon to navigators; Albay, which has had many destructive eruptions; and Taal, in the midst of the lake of Bonbon, which constantly emits dense volumes of smoke. Between Taal and Mt. Mainit (which signifies hot), about 15 m. distant, subterranean communication exists; and the waters of numerous thermal springs, bursting from the base of Mainit, rush to the lake of Bay (100 m. in circuit), darkening the air with such clouds of steam that the lake at a distance appears to be in continual ebullition. The crater of the extinct volcano of Socolme, which rises island-like from the bosom of Lake Bay to a height of 1,500 ft., is now filled with water, forming a most picturesque lake; and the crater of Mt. Maijay, one of the loftiest peaks in Luzon, also contains a lake of unfathomable depth. The lava which once flowed from the crater covered up numerous cavities, easily recognizable by the hollow sound; and inundations or earthquakes at times form in the crust vast fissures, which the natives call the "mouths of hell." In the district surrounding San Pablo are numerous circular lakes and heaps of rotten stones, basalt, and various species of lava, attesting the former existence of violent volcanic influences. Between the mountain ranges in the northern division are extensive plains of great fertility, watered by a large number of rivers, chief among which are the Apari or Cagayan, in the province of the same name, falling into the sea at Apari, after a course of 180 m., and the Pasig, issuing by seven branches from the lake of Bay and emptying into the bay of Manila. Both of these streams are navigable for vessels of considerable size. There are two distinct seasons: the wet, from June to December, when the S. E. winds prevail, and the rains are so copious as to cause the rivers to overflow and inundate the plains; and the dry, embracing the re-

mainder of the year, in which season water preserved in reservoirs during the summer is used for irrigation. The soil is very fertile, and gives abundant harvests with little care. All the mountains are clothed with a magnificent vegetation, and especially the volcanoes, on whose declivities flourish dense forests of gigantic trees, with palms, rattans, lianas in great variety, and particularly the wild sugar cane, often rising to a height of 12 ft.; while in the bosom of the hills are rich gold, copper, iron, and coal mines. Among the chief products are rice, of which more than 30 kinds are grown, wheat, indigo, tobacco (in Nueva Ecija and Cagayan), vegetable silk (*abacá*, from which are manufactured various kinds of tissues), coffee, cacao, cotton, the sugar cane, pepper, bamboos (from which are made weapons and instruments as sharp as those of steel, pots for boiling food, and from the filaments hats, baskets, and ropes), the cocoanut palm, and an endless variety of leguminous plants. The manufacture of tobacco is monopolized by the government, which at Binondo (its principal establishment) alone employs from 15,000 to 20,000 hands, making cigars for home consumption and export. To the manufactures already mentioned should be added matting of great fineness and brilliant colors, straw hats, cigar cases, baskets, cambrie finer than that of France, coarse earthenware, side arms, and carriages. Ships are built; clever workers in gold, silver, and copper are common; and the native women are expert at fine needlework. The island is divided into 24 provinces. The capital is Manila, and other towns of some importance are Cavite, Apari, and Santa Cruz. (See PHILIPPINE ISLANDS.)

**LUZULA**, a genus of glumaceous plants, called wood rushes; they belong to the *juncaceæ* or



Field Wood Rush (*Luzula campestris*).

rush family, but differ from *juncus*, the rush proper, in having softer, flatter, and grass-like leaves; their pod is one-celled and three-seed-



ed, while in the rush it is many-seeded and often three-celled. There are five species found in the northern states, three of which are peculiar to high mountains or far northern localities, while two are quite common in woods, meadows, and pastures; all of our species are natives of Europe also. The hairy wood rush (*L. pilosa*) is common in woods, and the field wood rush (*L. campestris*) is usually found in drier places; they both flower early in May; the former has but one flower to each stalk of the umbel, while the latter has several flowers in compact clusters to each stalk. In all the species the flowers have the general structure of the lily family, but the six sepals are husk-like and green or straw-colored. The plants have no important use, but are interesting in their structure and for their early flowering.

**LYCAON**, a mythical king of Arcadia, generally represented as a son of Pelasgus by Melibœa, daughter of Oceanus, and described by some as the first civilizer of his country, by others as a barbarian who defied the gods. He became by several wives the father of a great number of sons, who were so notorious for arrogance and impiety that Jupiter resolved to punish them. Appearing to them at their dwelling in Arcadia disguised as a poor man, they invited him to a repast, at which was served up the flesh of a boy whom they had murdered. The god rejected the horrible food, and transformed Lycaon and all his sons save one into wolves, or according to some destroyed them by a flash of lightning. The flood of Deucalion was said to have been a consequence of the crimes of the Lycaonidæ.

**LYCAONIA**, in ancient geography, a division of Asia Minor, bounded N. by Galatia, E. by Cappadocia, S. by Cilicia, S. W. by Isauria (which at certain periods was regarded as a part of it), and W. by Phrygia, and now included in the Turkish vilayet of Konieh. It was a narrow table land, deficient in water, with frequently varying boundaries. The inhabitants, according to the Acts of the Apostles, spoke a peculiar dialect. They were warlike and skilled in archery. The principal town was Iconium, now Konieh. Lycaonia is first mentioned in Xenophon's history of the expedition of the younger Cyrus, at the time of which it belonged to the Persian empire. After its conquest by Alexander and his death, it was attached to the kingdom of Syria, and subsequently came into the possession of Eumenes, king of Pergamus, while a portion of it was ruled by native chieftains. In the latter half of the 1st century B. C. it was conquered by Amyntas, king of Galatia, with which country it passed on his death to the Romans under Augustus, being annexed to the province of Cappadocia.

**LYCEUM**, the principal gymnasium at Athens, dedicated to Apollo Lyceus, whence its name. It was situated in the eastern suburb of the city, and was surrounded with lofty plane trees. It was elaborately adorned by Pisistra-

tus, Pericles, and Lycurgus the orator. Here Aristotle and his disciples taught, and were called peripatetics from their habit of walking up and down its porches while lecturing.

**LYCHNIS** (Gr. *λύχνος*, a light or lamp), a genus of old-world plants belonging to the pink family (*caryophyllaceæ*), and so called either on account of the flame color of some species, or because the cottony leaves anciently answered as wicks for lamps; the botanical name is in common use for the garden species. The scarlet lychnis (*L. Chalcedonica*), from Siberia, sometimes called Maltese cross, is an old garden plant, its single and double forms being from a fine rich scarlet to rose color and even white. Jupiter's lychnis and rose-of-heaven are names for *L. flos-Jovis* and *L. cæli-rosa*, species sometimes cultivated. The ragged robin or cuckoo lychnis (*L. flos-cuculi*) is a well known early summer plant, usually with double pink-red flowers. Another common plant in old gardens is the mullein pink or rose cam-



Scarlet Lychnis (*L. Chalcedonica*).

pion (*L. coronaria*), which has its stem and leaves covered with a white cottony down, and flowers varying from deep crimson to white. *L. Sieboldii*, from Japan, and *L. Haageana*, probably a hybrid, are comparatively recent introductions. The garden species are readily raised from seeds, and most of them are self-sowing; some are not perfect perennials, and need to be multiplied by division if it is desired to have them continue from year to year. Some of the species are weeds in Europe, and two have become naturalized in this country. The evening-blooming lychnis (*L. vespertina*), of which a double form is sometimes cultivated, has white or pinkish flowers, which open in the evening; it is as yet only sparingly established in the older states. The corn cockle, quite too common in our grain fields as well as those of Europe, is an annual, softly-hairy plant, with showy purplish-red flowers; this was formerly called *agrostemma githago*, but

is now placed in this genus, and is *lychnis githago*, the specific name being derived from *gith* or Guinea pepper. It is one of the most troublesome weeds of the older wheat districts, as its black seeds are so nearly the size of the wheat grains as to make their separation difficult, and their presence greatly deteriorates the quality of the flour.

**LYCIA**, an ancient country on the southern coast of Asia Minor, S. E. of Caria, and S. of Phrygia, Pisidia, and Pamphylia. The Solyma range borders its E. coast, and W. of it are the Massicytus and Cragus mountains. The principal rivers were the Xanthus and Glaucus. The slopes of the mountains were covered with beautiful woods and traversed by numerous brooks. The extreme fertility of the land and the excellence of its harbors raised the country at an early date into a flourishing condition. Its early history cannot be clearly traced. Herodotus states that this territory was anciently known by the name of Milyas, and that the Lycians, originally known as Termilæ, had come from Crete, where Sarpedon and Minos had disputed the sovereignty, and, Minos having been successful, Sarpedon had emigrated with his people. Lycus, son of the Attic king Pandion, took refuge in the land of the Termilæ to escape the persecutions of his brother Ægæus, and Sarpedon receiving him well, his people came to be called Lycians. Homer connects the Solymi of Lycia with the story of Belleophon (see BELLEOPHON), and mentions Lycians under Glaucus and Sarpedon among the defenders of Troy. The Lycians, according to Egyptian inscriptions, in which they are called Leka, assisted the Khitas in the fourth year of the reign of Rameses II., about 1400 B. C. They fought against Cræsus, succumbed to Cyrus, and furnished 50 ships to the army of Xerxes on his invasion of Greece. After the conquest of Persia by Alexander, Lycia belonged for more than a century to the Syrian monarchy. The Romans gave it to the Rhodians after their victory over Antiochus the Great. Soon afterward it became independent again, and formed a flourishing republican confederation of cities, which was finally overthrown by internal dissensions. The emperor Claudius united it with Pamphylia, and toward the close of the 4th century it became a separate Roman province, with Myra as its capital. The principal cities of Lycia whose names have come down to us are Xanthus, Patara, Pegasa, Pinara, Olympus, Phellus, Tlos, Telmissus, Arycanda, Limyra, and Phaselis.—The Lycian language has been preserved in inscriptions on the numerous monuments extant. The alphabet is closely related to the Greek, and contains 10 vowels and diphthongs and 20 consonants. The Lycians according to their own language called themselves Trameles; their city Xanthus was called *Tramele Arna*, Patara *Pttarazu*, and Pegasa *Begsere*. As the monuments are mostly of a Phrygian style, it is supposed that the Lycians were a

branch of the Phrygians. But as far as the remains of the Lycian language have been investigated, it was certainly different from the Phrygian. Blau, in the *Zeitschrift der deutschen morgenländischen Gesellschaft* (1863), considers it an Indo-European language, like the Phrygian and Thracian, and chiefly related to Albanese, or the present representative of the language of the ancient Illyrians. According to this view, the Phrygians, Thracians, and Illyrians once entered Asia Minor together from a N. E. direction. M. Schmidt, in his excellent work on the Lycian inscriptions, does not share this opinion.—The remains of Xanthus, Phellus, Myra, Telmissus, Patara, Pinara, and Tlos, so well known through the indefatigable labors of Sir Charles Fellows, show that these cities were surrounded by walls of a Cyclopean style, and that the Lycians possessed great skill in quarrying. The magnificent ruins of Xanthus, near the embouchure of the river of the same name, are of considerable height. The reliefs show the Chimæra as depicted in the Homeric poems. The Lycians themselves are represented as clad in long garments. There are also representations of battles, and of diverse employments in agriculture and cattle raising. As far as the inscriptions have been deciphered, nothing has been found to corroborate the statement of Herodotus that the Lycians received their names not from their fathers, but from their mothers. Herodotus says also that the son of a free woman and a slave was considered free and well born, but the son of a free man and a stranger or concubine was illegitimate. Heraclides of Pontus enlarged this account, stating that the Lycians had anciently been ruled by women. The ruins of tombs testify to the great care which the Lycians bestowed upon the dead. They are found inside of the city walls, surrounded by the remains of other buildings, and on the summits of mountains, and hewn into the sides of rocks. They are generally highly ornamented, covered with reliefs representative of various occupations of ordinary life, and some of them are painted. Lycian art, though not under the influence of that of the Persians, soon succumbed to that of the Greeks; and the most beautiful Lycian monument, the tomb of the Persian governor Harpagus, of the first half of the 4th century B. C., is mainly in the Grecian style.—Besides the works of Sir Charles Fellows, see Duncker, *Geschichte des Alterthums* (4th ed., Leipsic, 1874 et seq.).

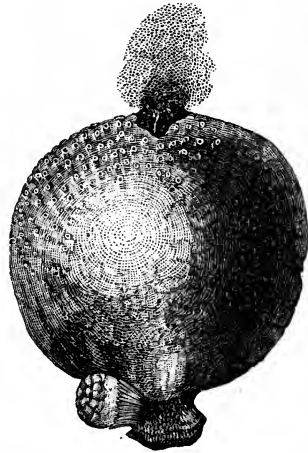
**LYCOMING**, a N. county of Pennsylvania, drained by the west branch of the Susquehanna and its tributaries; area, 1,080 sq. m.; pop. in 1870, 47,626. The surface is mountainous, a range of the Alleghenies extending through the middle from W. to E. with spurs stretching N. The valleys are very fertile, and it has extensive mines of bituminous coal. The West Branch canal and the Philadelphia and Erie and the Northern Central railroads pass through

it. The chief productions in 1870 were 272,668 bushels of wheat, 39,820 of rye, 535,158 of Indian corn, 470,619 of oats, 66,780 of buckwheat, 193,425 of potatoes, 25,804 lbs. of wool, 429,500 of butter, and 28,738 tons of hay. There were 5,591 horses, 7,597 milch cows, 7,772 other cattle, 10,462 sheep, and 12,172 swine. There were 608 manufacturing establishments, having \$7,875,938 capital, and an annual product of \$9,081,406; the most important were 3 of agricultural implements, 4 of brick, 23 of carriages, 11 of clothing, 1 of rectified coal oil, 10 of furniture, 1 of extract of hemlock bark, 6 of iron, 12 of machinery, 7 of brick and stone masonry, 17 of saddlery and harness, 5 of sash, doors, and blinds, 6 of woollen goods, 20 tanneries, 13 currying establishments, 12 flour mills, 8 planing mills, and 121 saw mills. Capital, Williamsport.

**LYCON**, a Greek philosopher, born in Laodicea, Phrygia, about 300 B. C., died in Athens about 226. He was a disciple of Strato, on whose death in 270 he became the head of the peripatetic school in Athens, and for 44 years he presided at the Lyceum. He regarded corporal punishment as injurious to youth, whom he sought to stimulate by feelings of honor and shame. His elocution was so harmonious that Diogenes Laërtius says his name was often written Glycon, "the sweet," but this was probably its original form. Cicero and Clement of Alexandria mention a work by Lycon on the limits of good and evil; Apuleius quotes a treatise of his on the nature of animals; and a fragment of a work on characters, probably his, is preserved by Rutilius Lupus.

**LYCOPERDON**, a genus of fungi, which in the accepted arrangement is placed in the *gasteromycetes*, one of the six divisions into which this immense order is separated, and of which the common puff-ball may be taken as a representative. As with other fungi, the true vegetative portion, the *mycelium*, consists of floccose threads, which in the case of the puff-balls spread in the soil; the portion which appears above ground is that concerned in reproduction; in these plants this is more or less globular, and when young is fleshy; the *peridium* or covering to the mass is of two coats, the outer of which breaks up into warts and scales; as the puff-ball perfects itself, the interior loses its fleshy character and becomes a dry mass of threads and exceedingly minute spores, which escape upon the slightest disturbance as a cloud of dust from an opening in the coating; the name puff-ball applied to these plants arises from the form of the peridium and the manner of emitting their spores. About a dozen species are recorded in Schweinitz's synopsis, most of which are also common to Europe. The rapidity with which puff-balls increase in size is remarkable; a giant puff-ball (*L. giganteum*) that was less than an inch in diameter at evening, has been known to enlarge to the diameter of a foot by morning. Several species are to be met with

in fields, and frequently by the side of little-travelled roads. Within a few years much attention has been given in England to fungi as a source of food, and at the various horticultural exhibitions premiums have been awarded for displays of both edible and poisonous species. The "Woolhope Naturalists' Field Club" has been especially efficient in making known the value of kinds not before considered edible, and in the reports of their annual dinners the giant puff-ball occupies a conspicuous place. It is of course only edible while it retains its solid and fleshy character. The late Rev. M. A. Curtis of Society Hill, S. C., paid much attention to the fungi as a source of food, and at his death left an unpublished monograph upon the subject. He wrote as follows to a correspondent in England: "The *lycoperdon giganteum* is also a great favorite with me, as it is indeed with all my acquaintances who have tried it. It has not the high aroma of some others, but it has a delicacy of flavor



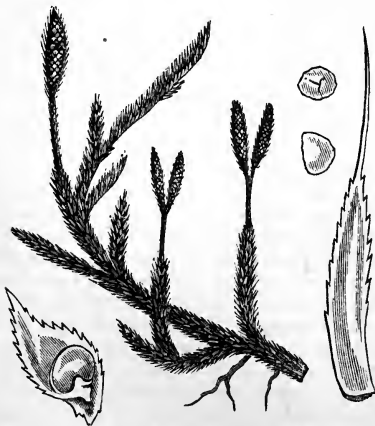
Giant Puff-ball (*Lycoperdon giganteum*).

that makes it superior to any omelette I have ever eaten. It seems furthermore to be so digestible as to adapt it to the most delicate stomachs. This is the South Down of mushrooms." It is prepared by cutting in slices, dipping these in egg and then in crumbs, and frying, in the same manner that the fruit of the egg plant is cooked. After puff-balls become dark-colored and dry inside they are no longer fit to be eaten, and when mature enough to emit their spores they should be handled with caution; serious consequences have followed the accidental inhalation of the dust-like spores. The fumes of the dry puff-ball when burned have long been known to possess anæsthetic properties; they are said by Berkeley to have been used in surgical operations, and their use in stupefying bees is of quite ancient date. The contents of the ball were formerly used as a styptic or siccative in surgery.

**LYCOPHRON**, a Greek poet and grammarian of the 3d century B. C., born in Eubœan Chalcis, died in Alexandria. He stood high in the favor of Ptolemy Philadelphus, and was one of the seven contemporary poets, termed from their number *Pleiades*, who graced the court of that monarch. Ptolemy intrusted him with the classification of the works of the comic poets contained in the Alexandrian library. Lycophron likewise composed a work on the history of Greek comedy and comic poets. Suidas has preserved the titles of 20 of his tragedies, while Tzetzes makes their number more than 60, of all which, however, only four lines remain. One of his poems is still extant, "Cassandra" or "Alexandra," a long iambic monologue, whose obscurity has become proverbial. The earliest edition of "Cassandra" is that of Venice (1513). The best editions are those of Potter (Oxford, 1697), and Bachmann (Leipsic, 1828). It has been translated into English by Lord Royston.

**LYCOPODIUM** (Gr. *λύκος*, a wolf, and *πούς*, a foot, a name of obscure application), the botanical name for a genus of cryptogamous plants popularly known as club mosses; this with a few other genera make up the family *lycopodiaceæ*, in which some botanists include two singular aquatic genera: pillwort (*pilularia*), and quillwort (*isoetes*). The lycopodiums are low perennials having something of the habit of the true mosses; their evergreen, one-nerved leaves are crowded upon the stems in from four to several ranks; the rather large spore cases (*sporangia*) are usually kidney-shaped, and placed either in the axils of the upper stem leaves, or at the base of broad bract-like leaves which are collected into a dis-

found in all parts of the world, some growing in high arctic latitudes, while others, and the finest species, occur in the tropics. East of the Mississippi there are nine species, with some well marked varieties; one of the best known of these is the one chosen for illustration, the common club moss, *L. clavatum*, which is widely distributed, and is found also in Europe and northern Asia. It has a strong creeping stem 1 to 2 ft. long, from which arise ascending, forked branches, 1 to 3 in. long; the whole plant is covered with small moss-like leaves, which have fine bristle-like points; the spikes are usually two or three together, 1 to 1½ in. long; the bract-like leaves about half as large as the stem leaves. The plant had formerly a reputation as a remedy in diseases of the bladder, and is now of considerable importance on account of its spores, which are known in commerce as lycopodium; when the spore cases are well formed, the plant is collected and dried, and the spores can then readily be separated by shaking and sifting; when examined by a microscope, the spores appear as spheroids upon a portion of the surface of which are three faces uniting to form a three-sided pyramid. In the mass the spores appear as a very mobile powder, which when rubbed between the fingers has a remarkably smooth feel; sprinkled upon the surface of water, lycopodium floats, and the hand may be dipped in water thus covered without its being moistened. In pharmacy lycopodium is used to prevent the adhesion of pills, and in medicine it is sometimes applied to excoriated surfaces; it is used in pyrotechny, but its chief consumption is for the production of artificial lighting for theatrical representations; when diffused the powder is very inflammable, and a cloud of it shaken into the air near a flame burns with a rapid flash. Some is collected in this country, but the greater quantity is imported from Europe. The most showy of our club mosses is *L. dendroideum*, its tree-like habit being recognized in its botanical name as well as in its popular one of ground pine; in this the stems arise from a subterranean, creeping root stock, and are from 6 to 9 in. high and branched above, the crowded fan-like branches spreading and clothed with very small leaves, giving the plant much the appearance of a miniature coniferous tree; it is found in moist woods, and in some localities is quite abundant. The delicate character of the plant and its fine dark green color make it valued by florists for use in constructing bouquets and floral decorations; it is an article of commerce under the name of bouquet-green, and many barrels are sent from the southern counties of New Jersey to New York and thence to all parts of the country; kept in a cool cellar where it will not dry up, it preserves its freshness for several months. Another species, *L. complanatum*, has very extensively creeping stems, several feet in length, along which arise numerous fan-like branches, which are



Common Club Moss (*Lycopodium clavatum*).

tinct spike; each spore case opens by means of a slit in two valves, and emits the spores in the form of a copious sulphur-colored powder. The germination is believed to be through the agency of a prothallus, as in ferns, but this is not well determined. The club mosses are

densely clothed with small leaves. This species is largely used to make wreaths and other Christmas decorations; just before the holidays immense quantities of this are sold in New York and other cities; the stems are tied together to form continuous "ropes," as the dealers call them, and are sold by the yard; the preceding species is also in great demand for Christmas green. Some of our species are only found upon high mountains or far northward, while others inhabit swamps and bogs; but the three above mentioned are the only ones that have any interest except to botanists.—The delicate plants cultivated in green-houses for the beauty of their foliage, though generally called lycopodiums, belong to a related genus, *selaginella*, which differs from *lycopodium* in having spore cases of two kinds, one two-valved, containing innumerable minute spores, and the other three- or four-valved, with three or four large spores; three species of this genus are found wild in the northern states, but they are greatly inferior in beauty to the exotics; one of the commonest of these is *S. Kraussiana* (*Lycopodium denticulatum* of the florists), which is a very quick-growing species, well adapted to a Wardian case, and when the air is not too dry will sometimes flourish in a hanging basket. A dozen or more other species are to be found in collections of plants. An interesting species is found in southern California and northern Mexico, *S. lepidophylla*; it consists of a tuft of flattened branching stems clothed with minute leaves, and has much the aspect of a fern. In the arid climate in which the plant is found clinging to the crevices of rocks, the stems are for the greater part of the year curled up to form a nest-like ball, and show only their brown under surfaces; when the rainy season comes, the dry stems uncurl, and the plants then appear as beautiful rosettes of a brilliant green. When quite dead the plants retain this property of expanding when moistened, and are frequently sold by street vendors as "resurrection plants."—The lepidodendrons, sigillarias, and other plants of the coal formation were enormous forms of *lycopodiaceae*.

**LYCURGUS**, the Spartan legislator, concerning whose personal history nothing certain is known, and many modern critics have doubted whether he ever really existed. According to Herodotus, he lived about 996 B. C., and the tradition in regard to him is that he became guardian to his nephew King Labotas of the Eurystheneid line of Spartan kings, and in this capacity transformed the institutions of his country into the order which they retained for centuries. Whether his system of things was revealed to him by the Pythian priestess, whose oracle he visited, or was learned by him in Crete, where he was said to have travelled, was a matter of dispute, the Spartans themselves taking the latter view. Under his institutions the Spartans became from the most lawless of the Greeks tranquil and prosperous,

and they regarded him reverentially, and built a temple to him after his death. This is the oldest statement concerning him. Thucydides, without mentioning Lycurgus, agrees in stating that the political system of the Spartans had been adopted by them four centuries before, and had successfully rescued them from intolerable disorders. This would make the introduction of the Lycurgan discipline to have occurred in 830–820 B. C., which Grote accepts as the most probable date. Timæus supposed two persons to have existed bearing the name, and that the acts of both had been ascribed to one. The more detailed account of Plutarch is deduced from Xenophon and Aristotle, and the poets Aleman, Tyrtaeus, and Simonides. He is stated to have been of the Proclid line of kings, 11th in descent from Hercules, son of Eunomus, younger brother of Polydectes, and uncle and guardian to Charilaus. After the death of Polydectes, leaving a pregnant widow, the latter proposed to Lycurgus that he should destroy her offspring, marry her, and become king. He refused the proffer, though temporarily exercising authority, and on the birth of Charilaus immediately presented him in the agora as the future king of the Spartans. Accused by the widow of ambitious designs, he left Sparta, and went to Crete, where he studied the laws of Minos and the institutions and customs of the different cities; thence he visited Ionia and Egypt, and, as some authors affirm, Libya, Iberia, and even India. In Ionia he is said to have obtained from the descendants of Creophylus a copy of the Homeric poems, which had not previously been known in the Peloponnesus; and some authors report that he had even conversed with Homer himself. Meantime, under the sway of Charilaus, Sparta was in a state of anarchy. On his return, finding the two kings as well as the people weary of their condition, and that he was regarded as the man to correct the disorders of the state, he undertook the task, and with this view consulted the Delphian oracle. Receiving strong assurances of divine encouragement, and also more special instructions, which were the primitive *rhetra* of his constitution, he suddenly presented himself in the agora, with 30 of the most distinguished Spartans, all in arms, as his guards and partisans. King Charilaus at once consented to second the designs of his uncle, and the bulk of the Spartans submitted to the venerable Heraclid, who appeared both as a reformer and as Delphic missionary. "Lycurgus," says Grote, "does not try to make the poor rich nor the rich poor; but he imposes upon both the same subjugating drill, the same habits of life, gentlemanlike idleness, and unlettered strength, the same fare, clothing, labors, privations, endurance, punishments, and subordination. It is a lesson instructive at least, however unsatisfactory, to political students, that with all this equality of dealing he ends with creating a community in whom not merely the love of preëminence, but



even the love of money, stands powerfully and specially developed." Having obtained for his institutions the approbation of the Delphic oracle, he exacted from his countrymen a promise not to alter them till his return, left Sparta, and was never again heard from. (For an account of the constitution of Lycurgus, see SPARTA.)

**LYCURGUS**, an Attic orator, born in Athens about 396 B. C., died there in 323. He first devoted himself to the Platonic philosophy, but afterward became a disciple of Isocrates. In 343 he was sent with Demosthenes on an embassy to counteract the intrigues of Philip. In 337 he was elected guardian of the public revenue for a term of four years, and continued in office for three consecutive terms, filling it so satisfactorily that 17 years after his death a monument was erected, reciting the great sums he had received and disbursed, and the ability with which he had discharged his office. He was also appointed superintendent of the city and censor, and in the latter capacity caused his own wife to be fined for violating one of his sumptuary enactments. He belonged to the party of Demosthenes, and was one of the ten orators whose surrender was demanded by Alexander, but the people of Athens refused to give him up. Of the prosecutions which he conducted, the most celebrated was that against Lysicles, who had commanded the army of Athens at Chæronea; Lysicles was condemned to death. There were 15 orations of his extant in the ages of Plutarch and Photius, but all have since perished except that against Leocrates, and some fragments.

**LYDGATE, John**, an English poet, born at Lydgate, Suffolk, about 1375, died in Bury St. Edmund's about 1461. After studying at Oxford, and visiting France and Italy, he entered the Benedictine monastery of Bury St. Edmund's, and established a school for instructing the sons of the aristocracy in versification and composition. He began to write about 1400. The principal of his works are his "Fall of Princes," "Storie of Thebes," and "Historie, Siege, and Destruction of Troye." His minor poems were published by the Percy society in 1840. Ritson, in his *Bibliographia Poetica*, gives a complete catalogue of his works.

**LYDIA**, an ancient country of western Asia Minor, bounded N. by Mysia, E. by Phrygia, S. by Caria, and W. by the Ægean sea. The boundaries, however, varied at different times. According to Strabo, the territory extended from the sources of the Hermus in the Dindymus mountains to the Ægean sea, and from the Messogis and the Cadmus in the south to the Temnus mountains in the north. The Hermus valley was of great fertility, but the most luxuriant vegetation was found near the Gygean lake. The Pactolus, an affluent of the Hermus, carried gold, and the rocks of Mts. Tmolus and Sipylus contained rich veins of it. The principal towns were Sardes, the capital, Magnesia at the foot of Mt. Sipylus,

Thyatira, and Philadelphia. In the earlier half of the 5th century B. C. the Lydian Xanthus, son of Candaules, wrote in Greek the history of his people in four books. Extant fragments of this and the statements of Herodotus relate the origin of their reigning houses. Atys, son of Manes, first ruled over them, and after him his son Lydus, after whom the people were called. The brother of Lydus, whom Xanthus calls Torrhebus and Herodotus Tyrsenus, was the father of the Torrhebi or Tyrseni, whose territory lay near the upper Cayster. The first sovereigns were called Atyadæ. Alcimus was the best among the successors of Lydus. Another, Meles, was the father of a lion, which was carried around Sardes in order to render the city impregnable. A later king, Jardanus, was succeeded by his daughter Omphale. Before she ascended the throne she caused the virgins of the land to meet at a certain place and offer themselves to the slaves, and she herself killed the strangers, her guests, after having rested at their side. The dynasty of the Atyadæ was followed by that of the Heraclidæ. According to Herodotus, Hercules was the father of Alcæus by a slave of Jardanus, and according to others by Omphale. Belus was the son of Alcæus, and Ninus of Belus. There can be no doubt as to the mythical nature of these accounts. Manes and Atys were Phrygian divinities; King Lydus was invented after the tribal name; King Alcimus's peaceful and successful reign is probably based on the common belief in an original happy state; the lion is presumed to point to the Syrian solar deity, which is all the more probable as it is recorded that the name of Sardes, the Lydian capital, was given after the god of the sun. The coins of Sardes were stamped with the image of the lion and the bull. Omphale is easily brought in connection with rites in the service of the Babylonian goddess Mylitta. This mixture of the Phrygian and the Semitic mythology has led to the supposition that the original inhabitants of the shores of the Hermus were Phrygians, and that Semites, coming from the east, conquered and absorbed them, but retained some elements of the Phrygian worship and language. It is possible that the dynasty of the Heraclidæ had been preceded by another. Candaules, the last of the Heraclidæ, was assassinated by Gyges at the instigation of his wife. With Gyges (about 700 B. C.) begins the dynasty of the Mermnadæ, and the historical period of the annals of Lydia. Gyges conquered Colophon, Magnesia, and Sipyla, and devastated Miletus and Smyrna. An invasion of the Cimmerians, however, compelled him, according to Assyrian accounts, to seek the aid of the Assyrians, by submitting to them as a vassal; but venturing to render assistance to Psammetik (Psammetichus), king of Egypt, his country was again invaded and ravaged by the Cimmerians at the call of the king of Assyria. Gyges died during the invasion, after a long reign, and his son Ardys had again to ac-

knowledge the Assyrian supremacy in order to free the country from the barbarians. Ardys suffered another invasion from them in the latter half of the 7th century, but they soon retired, and he extended his dominion over the Greek city of Priene. Sadyattes and Alyattes were the next kings. The latter, reigning 49 years according to Herodotus, succeeded in taking Smyrna and laying waste Miletus, and subsequently in subjugating Phrygia and Cappadocia, which brought his territory to the confines of the Median empire. Having given asylum to a Scythian tribe which had been in Median slavery, a war ensued between him and Cyaxares, king of Media, which lasted several years with varied success. During the last battle occurred an eclipse which caused both parties to cease fighting and to conclude peace, agreeing on the river Halys as the boundary of the two empires. The dates assigned to this eclipse range between 625 and 579 B. C.; Larcher's computation fixing it at 597 has been adopted by most scholars. A daughter of Alyattes was given in marriage to Astyages, son of Cyaxares. Croesus, the son of Alyattes, rapidly subjugated the Ionian and Æolian cities, and extended his sway over most of Asia Minor. Cyrus, king of Persia, in the mean time advanced toward the Halys, destroying the Median empire. Croesus, underrating the strength of the enemy, and misled, it is said, by the oracles of Delphi and Oropus, began the important war which speedily ended in the capture of Sardes, the Lydian capital, and his own captivity. (See CROESUS.) Soon after the departure of Cyrus the Lydians rose in insurrection, and compelled Tabalus, the Persian governor, to seek refuge in the citadel of Sardes. The Mede Mazares quickly repressed the rebellion, and Pactyas, the leader of the Lydians, escaped with the treasures, which Cyrus had put in his charge, to the Grecian isles; but after going from one to another, he was finally given up to the Persians. Lydia was thereafter a Persian satrapy, and shared the fate of the empire. Under the Persians, Lydia together with Mysia formed a satrapy of the empire. After the fall of the latter, it frequently changed masters. The Romans took it from Antiochus the Great of Syria, and gave it to Pergamus. After the death of the last Attalus, it became a part of the Roman province of Asia. It is now comprised in the Turkish vilayet of Aidin.—In regard to the culture of the Lydians, the Greeks considered them to be the inventors of the arts of stamping coins and dyeing wool. The Lydians were one of the earliest commercial people on the Mediterranean, and their scented ointments, rich carpets, and skilled laborers or slaves were highly celebrated. The Greeks received from them the Lydian flute, and subsequently the cithara of three and of 20 strings, and imitated their harmony. The Homeric poems describe the Lydians or Mæones as men on horseback, clad in armor, and speak of their

commerce and wealth. Lydia was rich in precious metals; vast quantities of gold were washed out of the sands of the Pactolus, and Croesus had gold mines in Pergamus. It seems that the worship of the Lydians resembled that of the Syrians, and was polluted with its immoral practices. Not far from Magnesia is a stone which projects about 20 ft. from a marble wall, and which is supposed to have been the idol of a native goddess. The ancient writers often mention the depravity of the Lydians, while admitting their skill and courage in war. When subdued they submitted quietly to their conquerors.—See Rawlinson's Herodotus; Spiegel, *Eränische Alterthumskunde* (2 vols., Leipzig, 1871-'3); and Duncker, *Geschichte des Alterthums* (4th ed., Leipzig, 1874 *et seq.*).

**LYDIAN STONE, Basanite, or Touchstone,** a velvet-black quartz or flinty jasper, used for testing gold alloys. The metal when rubbed upon the stone leaves a portion upon the black surface; and this being touched with a drop of nitric acid indicates to the experienced eye the comparative purity of the alloy by the color. Suitable pieces of quartz for this use were originally obtained in Lydia, whence the name.

**LYE, Edward,** an English philologist, born in Totness, Devonshire, in 1704, died at Yardley-Hastings, Northamptonshire, in 1767. He was specially devoted to the Saxon and Gothic languages. His first work was an edition of the *Etymologicon Anglicanum* of Junius, from the unpublished MSS., which appeared in 1743. He next published the "Gothic Evangelists" of Ulfilas. But his chief work was a large dictionary of the Anglo-Saxon and Gothic languages, which was finished just before his death (2 vols. fol., 1772).

**LYELL, Sir Charles,** a British geologist, born at Kinnordy, Forfarshire, Nov. 14, 1797. He graduated at Exeter college, Oxford, and in 1821 entered upon the practice of the law, but soon abandoned it in order to devote himself to geological pursuits, his natural taste for scientific studies having been stimulated by the lectures of Dr. Buckland, professor of geology at Oxford. At this period mere geological speculations, for which the previous half century had been distinguished, had given place to systematic investigation of nature. Lyell entered earnestly into this work, and his early papers, published in the "Transactions of the Geological Society" and in Brewster's "Journal of Science" in 1826 and 1827, chiefly upon the recent deposits of Forfarshire, Dorsetshire, and Hampshire, display remarkable powers of observation; while his use of the phenomena to illustrate and explain the mode of formation of similar deposits in more ancient periods exhibits a readiness to detect points of resemblance for which his subsequent writings are especially distinguished. In 1830 appeared his "Principles of Geology," which rapidly went through several editions, and was received with the greatest interest for the variety of

instructive facts brought together from the observations of the author and from others gathered from all parts of the world, for the clear and attractive style in which these were presented, and more than all for the skill with which operations now going on were made to explain those of past periods, and to account for the present condition of the surface of the earth. In successive editions the work so increased, that in 1838 the author divided it into two distinct treatises, retaining in one, which he called "Elements of Geology," the description of the formations of past periods, and giving in the other, "The Principles," the description of processes now going on by which the phenomena of the older formations are explained. In the edition of 1851 the "Elements" appeared with the title of "Manual of Elementary Geology," which, after passing through many editions, was replaced in 1870 by his "Student's Manual of Geology." These works placed their author in the first rank among geologists, and gave to the science itself a new character, removing from it all dependence upon visionary speculations by showing how its principles should be deduced in the true system of inductive philosophy from well observed facts.—In 1841 Lyell visited the United States, having been invited to deliver a course of lectures on geology in Boston. He availed himself of the opportunity to travel over a large portion of the northern and middle states, and as far south as Kentucky, giving special attention to the geological features of the country, and learning also by intercourse with the geologists and naturalists of the several states the results of their investigations. He also studied the different institutions of the country, particularly those of learning; and in a year thus spent in the United States, Canada, and Nova Scotia, he gathered a vast fund of information, some of the fruits of which are presented in his work entitled "Travels in North America in the years 1841-'2" (2 vols., London, 1845; 2d ed., 1855). The scientific matter contained in this book was prepared chiefly for the general reader; his more extended observations were presented in numerous papers published in the "Proceedings" and "Transactions" of the geological society of London, the "Reports of the British Association," and the "American Journal of Science." This work contained the most complete geological map of the United States published up to that time, in the compilation of which Lyell was greatly aided by Prof. James Hall of Albany. In September, 1845, he again embarked for the United States, and remained in the country till June, 1846. He visited portions of the northern states which he had not before seen, and devoted nearly six months to a tour through the southern states. He examined the most interesting localities of the tertiary formations in the states bordering on the Atlantic and the gulf of Mexico, passed up the Mississippi river, making many observations

of the deposits upon its banks and its influence as a geological agent, and in southern Missouri visited the sunk country of New Madrid devastated by the earthquake of 1811-'12. In 1849 he published "A Second Visit to the United States" (2 vols., London; 3d ed., 1855). Everywhere his observations were extended beyond the geological structure of the country, and included the manners and customs of the people he met with, and their various institutions; his criticisms upon these are expressed in a liberal and philosophical spirit.—In the modern progress of geology Lyell's name is more identified with the arrangement of the tertiary formations than with any other department. He first classified them into groups distinguished by the relative proportion of living and extinct species of fossil shells which they contained, and gave them the names of eocene, miocene, and pliocene, founded on this distinction, as described in the article GEOLOGY. He has investigated with special care those great natural phenomena in progress which involve long periods of time, and has undertaken to give approximate estimates of the time elapsed, based upon the results produced and the rate at which these are now proceeding. Thus, in visiting active volcanoes, he has sought to determine the age of the accumulations of lava from data afforded in modern times of their rate of increase. In examining the region of extinct volcanoes of central France, he applied the same method of reasoning to show that vast periods must have elapsed while the successive volcanic and fluvial deposits were produced; and in his second visit to the United States he found in the Mississippi river, and the great delta of its sediments deposited near the gulf, materials for another class of calculations of the same general character. In 1863 appeared his "Geological Evidences of the Antiquity of Man," a work in which he brought together a great amount of research with regard to prehistoric times. Lyell had previously opposed the doctrine of development, but in this remarkable work gave his adhesion to the theories of Darwin on the origin of species. Lyell was elected president of the geological society in 1836 and again in 1850, knighted for his services to science in 1848, in 1855 received from Oxford the degree of D. C. L., and in 1864 was created a baronet.

**LYGDAMIS**, a tyrant of Naxos, born about 580 B. C. He became a leader of the popular party in Naxos, and when they conquered the oligarchy he obtained the chief power. During his absence to assist Pisistratus on his third return to Athens, there was a revolution in Naxos; but Pisistratus subdued it and made Lygdamis tyrant of the island, about 540. Lygdamis assisted Polycrates (532) in obtaining the tyranny of Samos; but a few years later he himself was put down, with other tyrants, by the Lacedæmonians.

**LYGODIUM** (Gr. *λυγώδης*, flexible), a genus of climbing ferns, with much divided leafy fronds,

having stalked divisions in pairs, so that the frond appears like a slender stem bearing opposite, petioled leaves; the divisions of the frond are lobed, or sometimes even pinnate; the fructification is upon separate divisions, which are much narrower than the sterile ones, and bear upon the back two rows of scale-like indusia, each of which covers usually but a single spore case, which has a complete ring at the apex and opens by a longitudinal slit. There are a number of species, natives of warm countries, and extending to New Zealand, Japan, and North America. But one species (*L. palmatum*) is found on this continent; it extends from Massachusetts westward to Kentucky, and sparingly southward; in its eastern localities it is a rare plant, but in some parts of Kentucky it grows in abundance. The fronds, 1 to 4 ft. high, are from slender running root stocks; they climb upon bushes and tall weeds; the lower or sterile divisions, or



*Lygodium palmatum*.

frondlets, are round-heart-shaped and palmately five- to seven-lobed; the fertile ones, borne at the upper portion of the frond, are many times forked and form a terminal panicle. The great delicacy and grace of this fern make it much sought after for decorative purposes, for which it is used in both the fresh and dried state; it is employed to festoon picture frames, ornament white window curtains, and the like. One of the famous localities for this plant is at East Windsor hill, Conn., from which such large quantities were taken away yearly that an act was passed by the state legislature to prevent its extermination. The attempts to cultivate it frequently fail from the fact that the root stock is so fine and spreading that in taking up the plant this is in good part left behind. With careful management it can be transplanted. Some of the exotic species are favorite greenhouse plants, but there is much confusion in regard to the names; they are to be found in collections as

*L. polymorphum*, *L. scandens*, *L. volubile*, &c., and generally have their sterile divisions much cut and divided.

**LYLY, John.** See LILLY.

**LYMAN**, a S. county of Dakota, bounded N. and E. by the Missouri river, recently formed, and not included in the census of 1870; area, about 700 sq. m. It is intersected by White river and another affluent of the Missouri.

**LYMAN, Phineas**, an American soldier, born in Durham, Conn., about 1716, died in West Florida in 1775. He graduated at Yale college in 1738, and subsequently practised law in Suffield. In 1755, being commander-in-chief of the Connecticut militia, he served with Sir William Johnson at the battle of Lake George, and, after his commander had been disabled, conducted the engagement to a prosperous conclusion. He was present at the unsuccessful attack upon Ticonderoga by Abercrombie, and at the capture of Crown Point and the surrender of Montreal; and in 1762 he commanded the provincial troops in the expedition against Havana. Subsequently he passed many years in England in efforts to procure a grant of land on the Mississippi for the purpose of establishing a colony, and in 1775 embarked for that region, but died on the way. The emigrants who followed him encountered many misfortunes, and after the subjugation of the country by the Spaniards in 1781-'2 were obliged to take refuge in Savannah.

**LYME-REGIS**, a parliamentary borough and seaport of Dorsetshire, England, 22 m. W. of Dorchester; pop. in 1871, 2,338. The town lies between two rocky hills, a portion of it being on their steep sides. It is well built, well paved, and lighted with gas. It has a good harbor, protected by a semicircular pier; but its business is now very small. Lyme-Regis has recently become a fashionable watering place, with libraries, assembly rooms, &c. It received its first charter about 1250, and furnished Edward III. with three ships for the siege of Calais. It was besieged unsuccessfully by the royalists for two months in 1644.

**LYMPH** (Lat. *lymphā*, clear, pure water, from Gr. *λύπη*, a water spirit), the nearly transparent and colorless fluid found in the lymphatic or absorbent vessels extensively distributed over the body, in nearly all the organs and tissues. The lymphatic vessels commence in the substance of the tissues, probably by minute plexuses, converge toward the central parts uniting with each other into larger branches, which usually follow the same course as the corresponding blood vessels, pass through a series of small solid glandular organs, the "lymphatic glands," and finally empty into the venous system by two main trunks, viz.: the "thoracic duct," bringing the lymph from the lower extremities, the trunk, left upper extremity, and left side of the head and neck, which opens into the left subclavian vein; and the "right lymphatic duct," bringing the lymph from the right upper extremity and the right

side of the head and neck, which opens into the right subclavian vein. According to Robin, the lymphatic vessels at their commencement are closely in contact with the capillary blood vessels, so much so that the lymphatic often embraces the capillary blood vessel for one half, two thirds, or even three fourths of its circumference. It is evident that the lymph moves in the lymphatic vessels always in one direction, namely, from the circumference toward the centre, and does not like the blood return again in the opposite direction. It is a fluid taken up by absorption at the periphery, thence carried inward toward the centre of the circulation, and finally mingled with the venous blood at a short distance from the heart.—The fluid contained in the lymphatic vessels of the intestine during digestion has received a distinct name, that of "chyle," since it differs from the lymph in general by its opaque white color, and by containing an abundance of molecular fat and a larger proportion of albuminous matters. The composition of both lymph and chyle, and the difference between them, are shown in the following analysis, by Dr. G. O. Rees, of the lymph and chyle from the ass :

CONSTITUENTS.	Lymph.	Chyle.
Water.....	965·86	902·87
Albumen.....	12·00	85·16
Fibrine.....	1·20	8·70
Spirit extract.....	2·40	3·32
Water extract.....	13·19	12·83
Fat.....	traces.	86·01
Salts.....	5·85	7·11
	1000·00	1000·00

The lymph and the chyle are not therefore to be considered as two distinct fluids; since chyle is only the lymph of the intestine, which during the digestive process has absorbed an unusual proportion of nutritive materials. The lymph also contains, in addition to the above ingredients, small quantities of urea, sugar, and albuminose, the two latter varying in amount with the part of the body from which the fluid is taken and the period of the digestive process. The lymph, like blood, coagulates soon after it is removed from the vessels, owing to the fibrine which it contains, forming a more or less colorless and transparent solid clot and fluid serum. It contains a very small number of round, white, granular corpuscles, similar to the white globules of the blood, but of smaller average size. When taken from the thoracic duct of the living animal it also always contains a certain proportion of red blood globules, sufficient to give to its clot a slight rosy tinge after it has been exposed for a short time to the air; but this is believed by some authorities to be owing to an accidental rupture of some of the small blood vessels connected with the lymphatic system.—The quantity of lymph discharged daily into the venous system is very considerable. In the dog, the fluid discharged from the thoracic duct and collected by means of a silver canula

inserted into its extremity, at various periods after feeding, is on the average 1·75 part per hour for every 1,000 parts of the entire weight of the animal, making 42 parts in 1,000 for the whole 24 hours. In a dog weighing 30 lbs. this would give 1½ lb. of lymph and chyle daily. In a young kid weighing 14 lbs., 540 grains of lymph may be drawn from the thoracic duct per hour, representing rather more than 1½ lb. in 24 hours. M. Colin, of the veterinary school of Alfort in France, obtained from the thoracic duct of an ox in 24 hours more than 80 lbs. of fluid, and from a young bull a little more than 100 lbs. in the same time. In the horse, according to the same experimenter, the quantity is less than in the ruminating animals; but even in the horse he estimates the daily quantity at from 40 to 50 lbs. per day, or about 4½ per cent. of the entire weight of the animal. This corresponds with the results above mentioned as obtained in the case of the dog; and applying these lower estimates to the human subject, for a man weighing 140 lbs., it would give from 6 to 6½ lbs. of lymph and chyle per day. This quantity indicates the activity of the absorption by which the lymph is taken up from the tissues and returned by a circuitous route to the venous circulation.

**LYNCH, Patrick Neson**, an American bishop, born at Cheraw, S. C., March 10, 1817. After studying under the direction of Bishop England in the diocesan seminary of Charleston, he went to Rome in 1834, and studied philosophy and theology in the college of the Propaganda. He received his doctor's degree in the beginning of 1840, was ordained priest, and returned to Charleston, where he was appointed rector of the seminary and professor of theology. In 1845 he became rector of St. Mary's parish in that city, in 1847 rector of the cathedral, and in 1850 vicar general of the diocese. After the death of Bishop Reynolds in 1855 he was appointed by the pope administrator, was named bishop of Charleston Dec. 9, 1857, and consecrated March 14, 1858. During his administration Bishop Lynch has built several churches in his diocese, and founded a convent of Ursulines, an orphan asylum, and a large number of elementary schools for children of both sexes. It was also chiefly through his energy that the beautiful cathedral of St. Michael was completed. This and many of his churches and educational establishments having been destroyed during the civil war, Bishop Lynch has since 1865 devoted himself to preaching and lecturing throughout the northern and middle states for the purpose of collecting funds sufficient to repair these ruins. In 1869 he was present at the council of the Vatican, and sustained the definition of the dogma of papal infallibility. He has published several essays on astronomical, historical, and theological subjects.

**LYNCH, Thomas, jr.**, one of the signers of the Declaration of Independence, born in Prince George's parish, S. C., Aug. 5, 1749, died at



sea in the latter part of 1776. He was educated at Eton and at the university of Cambridge, and was subsequently admitted a student in the Temple, London. In 1772 he returned to South Carolina, relinquished the profession of the law, and settled upon a plantation on the North Santee river. At the outbreak of hostilities in 1775 he was appointed a captain in the first regiment of provincial regulars raised by South Carolina, and by his arduous exertions to recruit his command seriously impaired his health. Being unanimously chosen by the provincial assembly to succeed his father, who was unable through ill health to discharge his duties as a member of congress, he took his seat in that body in 1776, but in a few months was compelled by the precarious state of his own health to retire from active political life. One of his last public acts was to affix his signature to the Declaration of Independence. Toward the close of 1776, as the only means of saving his life, he was prevailed upon to sail for St. Eustatius, where he could find a neutral vessel which would convey him to France. The ship in which he sailed was never heard from after she had been a few days at sea, and is supposed to have been lost in a violent storm which occurred about that time.

**LYNCH, William F.**, an American naval officer, born in Virginia in 1801, died in Baltimore, Oct. 17, 1865. He entered the service as a midshipman in 1819, became a lieutenant in 1828, commander in 1849, and captain in 1856. In 1847 he planned an expedition to explore the course of the river Jordan and the shores of the Dead sea, which received the sanction of the government; and in November of that year he sailed for Smyrna in the naval store ship Supply, with a party consisting in all of 16 persons. On March 31, 1848, they landed in the bay of Acre; in April they were upon the lake of Tiberias, and commenced the navigation of the Jordan to the Dead sea, having for the purpose two metallic life boats. On April 19 they reached the Dead sea, of which a thorough exploration (including many soundings) was made. In May a portion of the party commenced their return to the Mediterranean by way of Jerusalem, a part remaining to determine by a series of levels the depression of the Dead sea below the Mediterranean; 23 days were occupied in this work, the result coinciding almost precisely with that obtained by Lieut. Symonds, an English officer. The depression was found to be about 1,312 ft. He published a "Narrative of the United States Expedition to the River Jordan and the Dead Sea" (Philadelphia, 1849), and "Naval Life, or Observations Afloat and on Shore" (New York, 1851). He resigned his commission in 1861, and was appointed a commodore in the confederate navy. His services were mostly confined to the coast of North Carolina. The flotilla which he commanded was defeated, Feb. 9, 1862, by Flag Officer Goldsborough. He subsequently commanded at Smithville, N. C.

**LYNCHBURG**, a city of Campbell co., Virginia, on the S. bank of James river, and on the James River and Kanawha canal, at the junction of the Washington City, Virginia Midland, and Great Southern railroad with the Atlantic, Mississippi, and Ohio line, 90 m. W. by S. of Richmond; pop. in 1850, 8,067; in 1860, 6,853; in 1870, 6,825, of whom 3,353 were colored; in 1874, about 13,500. It occupies a steep acclivity rising gradually from the river bank, and breaking away into numerous hills, whose terraced walks and ornamented dwellings give a picturesque and romantic appearance to the town. About 20 m. in the background rises the Blue Ridge, together with the celebrated peaks of Otter, which are in full view. Lynchburg is supplied with water by a reservoir constructed in 1828, at an expense of \$50,000. This reservoir is situated at a point 253 ft. above the level of the James river, and is capable of containing 400,000 gallons of water, which is forced a distance of 2,000 ft. by a double force pump, worked by a large breast wheel. The city is favorably situated for a large inland commerce, and for manufactures. It has tributary to it a great extent of magnificent country, enjoys almost inexhaustible water power, which is yet however undeveloped, and is in the neighborhood of vast fields of coal and iron ore. The celebrated Botetourt iron works are not far distant. Tobacco manufacturing, which is the chief industry, employs about 40 establishments, and there are two iron foundries, besides the extensive machine shops of the Atlantic, Mississippi, and Ohio railroad company. There are two national banks with a capital of \$400,000, an insurance and banking company with \$350,000, three savings banks, a court house, jail, small-pox hospital, female orphan asylum, four large public school buildings, with a system of graded schools, including two high schools, several private schools, three daily and three tri-weekly newspapers, and one weekly, a monthly periodical, ten churches, and three chapels.—Lynchburg was laid out in 1786. It was strongly held by the confederates during the civil war, and was an important source of supplies till February, 1865, when Gen. Sheridan destroyed the canal and railroads for a considerable distance around it. Lee was endeavoring to reach it when he surrendered.

**LYNCH LAW**, as commonly used in America, the practice of punishing men for alleged crimes and offences by private and unauthorized persons, without a trial according to due forms of law. The practice has more or less prevailed in times of popular excitement, and especially in newly settled regions before the power of the civil government had been established. According to some authorities, the term was derived from a Virginia farmer named Lynch, who having caught a thief, instead of delivering him to the law, tied him to a tree and flogged him with his own hands. Another account says that "in 1687-'8 one Lynch was

sent to America to suppress piracy; but as the laws were not administered with much vigor in the colonies, owing to the difficulty of adhering to the usual forms of law in the newly established territories, it is presumed that this Judge Lynch was empowered to proceed summarily against pirates, and thus gave rise to the term." Still another account, which seems to rest upon no good authority, connects the term with Mr. Lynch, the founder of Lynchburg, Va. But it can be traced to a much earlier date in Ireland. In 1493 James Fitzstephens Lynch was mayor and warden of Galway. He traded largely to Spain, and sent his son thither to purchase a cargo of wine. The young man squandered the money intrusted to him for this purpose, but succeeded in running in debt for a cargo to a Spaniard, by whose nephew he was accompanied on the return voyage to Ireland, where the money was to be paid. Young Lynch, to conceal his defalcation, caused the Spaniard to be thrown overboard, and was received at home with great honor, as having conducted a most successful business operation. But a sailor on his deathbed revealed to the mayor of Galway the crime which his son had committed. The young man was tried before his own father, convicted, and sentenced to be hanged. His family and others undertook to prevent the execution; and the father, finding that the sentence could not be carried into effect in the usual way, conducted his son up a winding stairway to a window overlooking the public street, with his own hands fastened the halter attached to his neck to a staple in the wall, and acted as executioner. In the council books of Galway there is said to be a minute that "James Lynch, mayor of Galway, hanged his own son out of the window for defrauding and killing strangers, without martial or common law, to show a good example to posterity."

**LYNDHURST, John Singleton Copley**, a British statesman, born in Boston, Mass., May 21, 1772, died Oct. 12, 1863. He was a son of the artist Copley, went with his mother and sisters to England in his third year, and was educated under a private tutor and at Trinity college, Cambridge, where he graduated in 1794. He visited the United States and Canada, returned to England in 1798, was called to the bar in 1804, went on the Midland circuit, and rose slowly to eminence in his profession. He had obtained the leadership of the circuit, when in 1817 he attracted general attention by his part in the defence of Watson, charged with high treason as one of the rioters at Spa Fields. He was also in that year counsel for the crown in the prosecution of Brandreth, who was executed for high treason as a ringleader of the Derby tumults. Though his politics had originally been liberal, he entered parliament in 1818 under tory auspices, was soon after knighted, and was solicitor general in the Liverpool administration from 1819 to 1823. In 1820 he assisted in managing the

trial of Queen Caroline by the house of lords. He became attorney general in 1824, was returned in 1826 with Viscount Palmerston as member for the university of Cambridge, and a few months later was made master of the rolls. In 1827 he opposed the bill for Roman Catholic emancipation; but under Mr. Canning, who immediately after formed a cabinet on liberal principles, he accepted the chancellorship on the retirement of Lord Eldon, and was raised to the peerage as Baron Lyndhurst of Lyndhurst (April 27). He retained the great seal through the Canning, Goderich, and Wellington administrations, favoring the reformatory views of the first and the concessions of the last, advocating in 1828 the repeal of the test and corporation acts in opposition to Lord Eldon, and in 1829 supporting the scheme of Catholic emancipation. He resigned his office on the accession of Earl Grey to power in 1830, but this ministry gave him in 1831 the judicial station of lord chief baron of the exchequer, which he held till 1834. He was one of the most strenuous opponents of the reform bill, and was prominent in effecting the defeat and consequent resignation of Earl Grey's ministry on May 7, 1832. On the formation of the first Peel ministry in 1834 he was restored to the chancellorship, but relinquished it after the resignation of this ministry. He efficiently resisted the claims urged by the Roman Catholics of Ireland, and was especially formidable from his custom of reviewing annually the measures of each parliamentary session in speeches remarkable for their sarcasm and brilliancy. When Sir Robert Peel returned to power in 1841, the great seal was for the third time given to Lord Lyndhurst. The fall of the Peel ministry in 1846 he regarded as the termination of his public life; but he afterward occasionally took a prominent part in the debates in the house of lords. He was twice married, but all his issue being daughters, his title expired with him.

**LYNN**, a city of Essex co., Massachusetts, bordering S. on Lynn harbor, an arm of Massachusetts bay, and S. E. on Nahant bay, separated from the harbor by the peninsula of Nahant, which juts out in a S. direction from the city, at the junction of the Eastern railroad with its Sangus branch, 10 m. N. E. of Boston; pop. in 1850, 14,257; in 1860, 19,083; in 1870, 28,233, of whom 4,935 were foreigners. Its limits include a large plain in the south and west, raised but a few feet from the water level; a range of hills in the rear; a number of ponds known as the lakes of Lynn, beyond these; and in the northeast an elevated plain, the most pleasant and healthy portion of the city. The N. and W. parts are not thickly settled; in the remaining portions the streets are well paved and lighted with gas. There are a number of public squares, the principal of which is the common, in the S. part of the city. Pine Grove cemetery, N. of the populous section, is under the control of the city.

and is handsomely laid out. Further out is St. Mary's cemetery (Roman Catholic). A monument in memory of the soldiers who fell in the civil war was dedicated in 1873. Lynn is celebrated for its manufacture of shoes, in which it surpasses every other place in the United States. There are nearly 200 establishments engaged in the business, employing about 10,000 hands. The shipments in 1871 were 200,801 cases, containing 9,036,045 pairs; in 1872, 226,360 cases, 10,186,200 pairs; in 1873, 213,080 cases, 9,523,600 pairs. The value of the shipments is from \$13,000,000 to \$14,000,000 a year. The larger part of the goods consists of low-priced shoes for women, misses, and children, though nearly every variety of sewed boots and shoes is made here. In 1873 there were 180 McKay sole-sewing machines in use in the city, and of the whole production 7,064,467 pairs were bottomed on these machines. The manufacture of morocco, embracing kid and sheep skins as well as goatskins, is of considerable importance. From 15 to 20 manufacturers are engaged in the business, employing 400 workmen and about \$1,000,000 capital. The largest factory is capable of tanning and finishing 5,000 skins a week. There are also some minor manufactures, embracing machine needles, shoe machinery, boxes, carriages, cement, &c.; three national banks, with a joint capital of \$1,000,000; two fire insurance companies; and two savings banks, with deposits in 1873 amounting to \$3,018,102 82.—The city is divided into seven wards, and is governed by a mayor, a board of aldermen of 8 and a common council of 22 members. It has a fire department and a police force, and is supplied with water from Reed's pond in the N. W. part of the city, by works erected at a cost of \$800,000. The valuation of property in 1850 was \$4,834,843; in 1855, \$8,284,649; in 1860, \$9,649,065; in 1865, \$10,619,006; in 1870, \$20,927,115; in 1873, \$27,456,438. The taxation in 1873 amounted to \$531,925 40, of which \$34,402 50 was for state and \$21,006 80 for county purposes. The expenditures were \$858,642 69, the principal items of which were \$33,144 36 for the fire department, \$94,328 02 for interest, \$188,275 73 for the introduction of water, \$48,315 77 for laying out, altering, and lighting streets, \$32,873 06 for the poor department, \$24,125 10 for the police department, \$5,000 for the public library, \$103,447 39 for the school department (of which \$71,437 81 was for teachers' wages), \$24,822 50 for salaries, and \$42,257 65 for school houses. The net debt, Jan. 1, 1874, was \$1,785,303. The public schools are graded, and in a flourishing condition. The number of children of school age (5 to 15 years) in 1873 was 7,202; number of public day schools, 58 (1 high, 7 grammar, and 50 primary); number of teachers, 105 (7 male and 98 female); average number of pupils enrolled, 4,720; average attendance, 4,095; value of school property, \$452,800. The number of evening schools

taught was 8; number of teachers, 52; pupils enrolled, 845; average attendance, 481. The public library on Jan. 1, 1874, contained 18,635 volumes and 3,027 pamphlets. A semi-weekly and three weekly newspapers are published. The number of churches is 30, viz.: 4 Baptist, 1 Christian, 4 Congregational, 2 Episcopal, 1 Freewill Baptist, 1 Friends', 8 Methodist, 2 Roman Catholic, 1 Second Advent, 2 Spiritualist, 1 Unitarian, 2 Universalist, 1 miscellaneous.—Lynn was settled in 1629, and incorporated as a city in 1850. Swampscott was taken from it in 1852, and Nahant in 1853.

**LYNN-REGIS**, or **King's Lynn**, a parliamentary borough and seaport of Norfolk, England, on the Great Ouse near the Wash, 38 m. W. N. W. of Norwich; pop. in 1871, 17,266. Four small rivulets called fleets, crossed by numerous bridges, intersect the town in various directions. There are extensive remains of the old embattled wall and bastions. The streets, excepting the newer ones, are narrow. The chapel of St. Nicholas, erected in the 14th century, is one of the finest in the kingdom, in the Gothic style, 200 ft. in length and 78 ft. in breadth. Lynn exports corn, wool, sand for glass, and various manufactures, and imports coals, timber, hemp, wine, cork, tallow, &c. King's Lynn, the English form of the name, has been adopted to avoid confusion with Lyme-Regis, a town in Dorsetshire.

**LYNX**, a carnivorous mammal, usually arranged with the cats, but differing from the genus *felis* in wanting the small upper pre-molar next the canine, the dentition being—incisors  $\frac{3}{1}$ , canines  $\frac{1}{1}$ , and molars  $\frac{3}{3}$ —28. The head is short and arched; jaws short; ears short, erect, and more or less tufted; fore feet with five toes, and hind feet with four, with



Canada Lynx.

retractile nails; tail as long as or shorter than the head, and truncated at the tip; body short and stout. There are certain differences in the skull also, which justify a separation from

*felis*, and the acceptance of the genus *lynx* (Raf.). The largest American species is the Canada lynx (*L. Canadensis*, Geoffr.), the *loup cervier* of the Canadians; it is about as large as a setter dog, or 3 ft. long to the base of the tail, the latter being 6 in. to the end of the hair; the triangular ears have an erect tuft of coarse black hairs; the general color is gray above with darker clouds, and lighter beneath; the feet very large, with naked pads underneath, densely furred in winter, and then making a track in the snow 9 in. long and almost as large as that of a black bear; the eyes large, nose obtuse, ears with a narrow margin of black, whiskers stiff and chiefly white; in summer the fur is shorter and more rufous. This lynx lives in the deepest woods, rarely approaching the habitations of man, and is most abundant in the regions north of the great lakes, its thick fur enabling it to resist the greatest cold; it is very strong and active, an excellent climber, and a good swimmer. It breeds once a year, having generally two whelps at a time. Its flesh is eaten by Indians and hungry trappers, and its fur is prized for robes, muffs, collars, &c.; it is most often caught in steel traps, which it readily enters. It feeds principally on grouse and birds of similar size, on rabbits and other northern rodents; when hard pressed it will attack as large an animal as a deer, and sometimes prowls about the pioneer's cabin in search of lambs, pigs, and poultry. It rarely descends into the New England and middle states, but is found principally from Canada to lat. 66° N., to the east of the Rocky mountains.—The bay lynx, or American wild cat (*lynx rufus*, Guld.), is 30 in. long, and the tail 5½ in.; the weight about 17 lbs. The general color is reddish brown in autumn and winter, and ashy brown in spring and summer; the tail is nearly as long as the head, with its extremity on the upper surface black, tipped with more or less white; there is a whitish spot on the hinder part of the ear, bordered with black. The soles of the feet are naked, and the ears are not tufted as in the

considerable havoc among the chickens and other poultry in its neighborhood, and among quails, partridges, and such birds as it can surprise. It shows an affinity to the domestic cat by mewing and purring when in confinement; in the woods, during the winter, its caterwauling may be heard for a long distance; it no doubt is occasionally crossed by the domestic species in wild localities. There are varieties of this in Texas and Mexico and on the Pacific coast, described as *L. maculatus* (Aud. and Bach.) and *L. fasciatus* (Raf.).—The European lynx (*felis lynx*, Linn.) is about the size of the Canada species, but the color is deeper rufous with more distinct brownish spots; the hair is shorter, and the tail longer, more tufted, with the terminal half black. It is spread over southern Europe and Asia, and furnishes a considerable quantity of valuable fur for robes and coverings; its physiognomy is much less ferocious than that of the cats of the same size.



Lynx caracal.

The booted or marsh lynx (*L. caligatus*, Temm.) is smaller than the preceding species, with a longer tail; the color is bluish gray, with indistinct transverse blackish bands, reddish below, the long ears tipped with a blackish pencil, and a large patch of black on the leg extending nearly to the first joint (whence the common name of this species), and the tail black at the end, with two or three rings of black and white above this. The chaus is probably a variety; both are found in Asia and northern Africa. The caracal (*L. caracal*, Linn.; genus *caracala*, Gray) is of a vinous red color, whitish below and around the head and throat; it is about 2½ ft. long and 20 in. high; the ears are very long, and tufted. This is the animal called lynx by the ancients, supposed by them to possess a wonderful power of sight, and said to have been kept and trained for the chase like the hunting leopard (*F. jubata*, Schreber); there is no such faculty in the modern animal, which is very restless and suspicious in confinement. It possesses the activity and carnivorous propensities of its congeners, pursuing its prey, wheth-



Bay Lynx.

Canada lynx; the latter animal is also considerably the larger. The wild cat is a cowardly animal, rarely attacking any quadruped larger than a hare or a young pig; it commits con-

er bird or quadruped, into trees. According to Temminck, this species hunts in packs like dogs, tracing prey by the scent, and also eats the leavings of the lion and larger carnivora; these dog-like habits may indicate the lynx as one of the animals connecting the cats with the dogs. It is found in Asia and Africa. Other species are described.

**LYON**, the name of five counties in the United States. **I.** A W. county of Kentucky, bounded S. W. by the Tennessee river, and intersected by the Cumberland; area, about 375 sq. m.; pop. in 1870, 6,293, of whom 1,419 were colored. The surface is diversified, and the soil fertile. The chief productions in 1870 were 15,505 bushels of wheat, 263,925 of Indian corn, and 854,212 lbs. of tobacco. There were 1,116 horses, 1,131 milch cows, 2,250 other cattle, 3,486 sheep, and 8,782 swine; 2 flour mills, and 2 iron works. Capital, Eddyville. **II.** A S. W. county of Minnesota, bordering on Dakota, recently formed, and not included in the census of 1870; area, 1,980 sq. m. It is watered by Redwood and Big Cottonwood rivers. **III.** The N. W. county of Iowa, bordering on Minnesota on the N., and separated from Dakota on the W. by the Big Sioux river; area, 640 sq. m.; pop. in 1870, 221. It is intersected by Rock river. **IV.** An E. county of Kansas, intersected by the Neosho river; area, 858 sq. m.; pop. in 1870, 8,014. Timber is abundant in the river bottoms, and the soil is fertile. The Missouri, Kansas, and Texas, and the Atchison, Topeka, and Santa Fé railroads traverse it. The chief productions in 1870 were 112,153 bushels of wheat, 342,855 of Indian corn, 106,006 of oats, 32,004 of potatoes, 14,986 lbs. of wool, 129,120 of butter, and 16,740 tons of hay. There were 3,108 horses, 4,188 milch cows, 7,983 other cattle, 3,214 sheep, and 2,655 swine; 1 brick kiln, 2 flour mills, and 5 saw mills. Capital, Emporia. **V.** A W. county of Nevada; area, 480 sq. m.; pop. in 1870, 1,837. It embraces a large portion of the valley of the Carson and some of that of Walker river, comprising large tracts of arable and grazing lands. Copper ore is found, and the precious metals exist in the mountains S. E. of the county seat, but the deposits have not been worked. There is good water power, which is chiefly used in crushing ores obtained in the adjoining counties. The Central Pacific railroad skirts the N. E. border. The value of farm productions in 1870 was \$35,295; of live stock, \$18,535. There were 22 quartz mills, an iron foundry, and a machine shop. Capital, Dayton.

**LYON, George Francis**, an English traveller, born in Chichester in 1795, died on the passage from America to England in 1832. He entered the naval service in 1809, was present at the attack on Algiers by Lord Exmouth in 1816, and in 1818 was commissioned to accompany Joseph Ritchie on his tour of exploration into central Africa. Ritchie died at Moorzook in Fezzan, and Lyon returned to Eng-

land, after encountering many dangers and privations, and published his "Narrative of Travels in Northern Africa" (4to, London, 1821). In 1821, in command of the Hecla, he accompanied Capt. Parry on his arctic expedition, publishing on his return "The Private Journal of Captain G. F. Lyon," &c. (8vo, 1824). In 1824 he made an unsuccessful attempt in the Griper to enter Repulse bay in the arctic regions, through Sir Thomas Rowe's Welcome, of which he also published a narrative. His remaining works are: "The Sketch Book of Captain G. F. Lyon during 18 Months' Residence in Mexico, No. 1" (London, 1827), and "Journal of a Residence and Tour in the Republic of Mexico in 1828" (2 vols., 1828).

**LYON, Mary**, an American teacher, born in Buckland, Mass., Feb. 28, 1797, died in South Hadley, Mass., March 5, 1849. Under great difficulties she acquired by persevering effort such an education as she judged necessary to qualify her as a teacher, and for several years was engaged in teaching in different schools. In 1837 she succeeded in opening at South Hadley, Mass., the Mount Holyoke female seminary, upon a plan which she had been maturing for many years, the peculiar feature of which was the combination of domestic labor with the highest moral and intellectual culture. She presided over this institution with great success until her death; and many of her pupils have since established schools upon a similar plan. Her only published works are a pamphlet entitled "Tendencies of the Principles embraced and the System adopted in the Mount Holyoke Female Seminary" (1840), and "The Missionary Offering" (Boston, 1843).—See "Power of Christian Benevolence, illustrated in the Life and Labors of Mary Lyon," by Edward Hitchcock, D. D. (Northampton, 1851; 2d ed., 1860).

**LYON, Matthew**, an American politician, born in Wicklow co., Ireland, in 1746, died at Spadra Bluff, Arkansas, Aug. 1, 1822. He emigrated to New York in 1755, and, being unable to pay for his passage, was assigned by the captain of the ship, in accordance with the practice of the time, for a pecuniary consideration, to a farmer in Connecticut, in whose service he remained a number of years. Subsequently he became a citizen of Vermont, and in July, 1776, was commissioned as lieutenant in one of the companies of "Green Mountain boys." In the latter part of the same year he was cashiered for unnecessarily deserting a post on Onion river; but he subsequently served as commissary general, and eventually rose to the rank of colonel of militia. After the war he engaged in paper making, iron casting, and a variety of other occupations, and at one time edited a newspaper entitled "The Scourge of Aristocracy and Repository of Important Political Truth," of which the types and paper were manufactured by himself. He married a daughter of Gov. Chittenden, and, becoming an active political leader, was elected in 1797



to congress by the anti-federal party. In October, 1798, he was convicted of a libel on President Adams, and confined for four months in the Vergennes jail, a fine of \$1,000 which had also been imposed upon him being paid by his friends. An attempt to expel him from congress as a convicted felon failed for want of a two-thirds vote. During this congressional term he had a personal altercation on the floor of the house with Mr. Griswold of Connecticut, ending in blows; but the motion to expel them was defeated. In 1799, while a prisoner in jail, he was reelected to congress, and after the expiration of his term removed to Kentucky. At the first congressional election held after his arrival he was returned to the house, of which he continued a member till 1811. Subsequently he held the office of United States factor for the Cherokee Indians by the appointment of President Monroe, and removed to Arkansas, of which he was the territorial delegate elect to congress at the time of his death.

**LYON, Nathaniel**, an American soldier, born at Ashford, Conn., July 14, 1819, killed at Wilson's creek, Missouri, Aug. 10, 1861. He graduated at West Point in 1841, and served in the Florida and Mexican wars. From 1848 to 1853 he was on duty in California and Oregon, and from 1854 to 1861 in Kansas and Missouri. At the outbreak of the civil war he was in command of the arsenal at St. Louis, and broke up a camp of secessionists established by the governor, C. F. Jackson. Jackson then assembled a force at Boonesville, where he was routed (June 17, 1861) by Lyon, now brigadier general of United States volunteers. On Aug. 2 Lyon defeated a body of confederates under McCulloch at Dry Spring, near Springfield; but McCulloch, being soon after joined by Price, had a preponderance of force so great that it seemed likely that he would be able to hold all of S. W. Missouri. Rather than abandon this region, Lyon resolved to risk a battle at Wilson's creek, where, after having been twice wounded, he was leading into action a regiment whose colonel had fallen, when he was shot in the breast, and killed on the spot. He bequeathed \$80,000, nearly all his property, to the government to aid in the prosecution of the war. In 1860, while on duty in Kansas, he published in a local newspaper a series of articles advocating the election of Abraham Lincoln to the presidency. These were collected in a volume entitled "The Last Political Writings of Gen. Nathaniel Lyon" (New York, 1862).

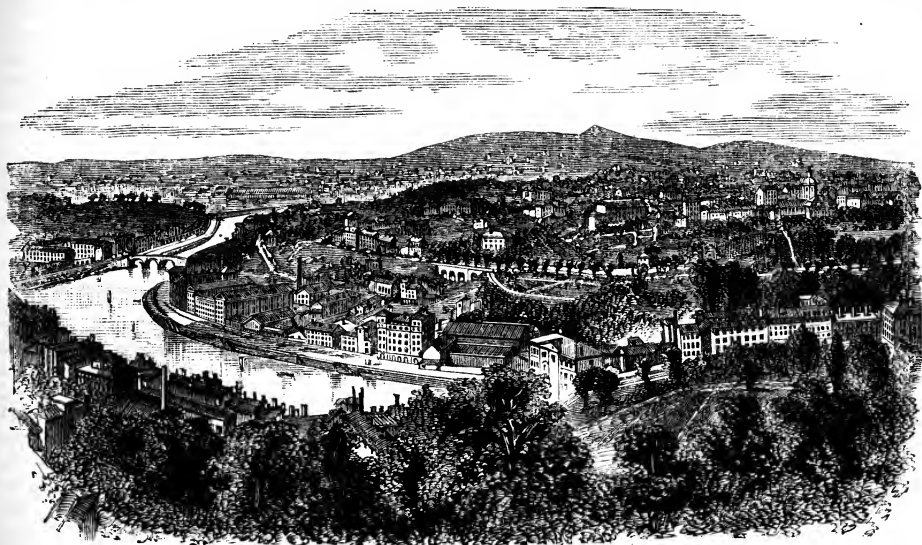
**LYONNAIS**, an ancient province of France, bounded by Bourbonnais, Burgundy, Dauphiny, Languedoc in the wider sense, and Auvergne. Its capital was Lyons. It was divided into Lyonnais proper and Franc-Lyonnais, and now forms the departments of Rhône and Loire and a part of the department of Ain.

**LYONS** (Fr. *Lyon*; anc. *Lugdunum*), the principal manufacturing city of France, and since 1884 one of its most powerful fortresses, capital

of the department of Rhône, at the junction of the Saône and Rhône, 245 m. S. S. E. of Paris, 175 m. N. N. W. of Marseilles, and 70 m. W. S. W. of Geneva; pop. in 1872, 323,417. The city proper is chiefly built on a peninsula or tongue of land between the Saône and Rhône. Some extensive quarters, as St. Just, St. George, St. Irénée, Vaise, &c., are situated on the W. or right bank of the Saône, on and around the hill of Fourvières, which is crowned by the church of Notre Dame de Fourvières, the dome of which is 360 ft. above the Saône, commanding the most imposing view of the city and of the Alps on the east; and on the left bank of the Rhône are the suburb of La Guillotière, which is divided into two sections by the main street, and the new district of the Quartier des Brotteaux, now the handsomest part of the city. South of the city the new and handsome suburb Perrache extends toward the peninsula; and on the north, beyond the fortifications, on the declivity of a hill extending from one river to the other, is the commune of La Croix-Rousse, including the suburbs of Serin and St. Clair, and chiefly inhabited by weavers. Even the most repulsive and ancient parts of Lyons, where the narrow and crooked streets and lanes are darkened by the excessive elevation of the houses, which are seven to nine stories high, have been improving for many years past. There are over 50 squares or public places in Lyons, but only a few of them are very attractive; of these the Parc de la Tête d'Or is the most frequented. The Place Bellecour, however, is one of the largest squares in Europe. The other leading square is the Place des Terreaux, with the hôtel de ville and the museum or *palais des beaux-arts*. Cinq-Mars and De Thou were executed in this square, and the guillotine was erected there in 1794.—The Saône is spanned by 12 bridges. The principal are those of Nemours, Tilsit or de l'Archevêché, the superb bridge of Mulatière, and the bridge de la Quarantaine. The Rhône is spanned by seven bridges, the most noted of which are the suspension bridge, Lafayette bridge, and the bridge de la Guillotière, the most ancient in the city. The quays of Lyons are the most remarkable of Europe; among the most celebrated are those of St. Clair and St. Antoine. The principal public buildings are the city hall and the *palais des beaux-arts*. The former is one of the finest of the kind in France, has a front of about 150 ft., and is flanked with a square tower and dome at either end; the balustrade is ornamented with statues of Hercules and Minerva, and in the centre is a clock tower surmounted by a cupola. The *palais des beaux-arts*, in the ancient convent of St. Pierre, consists of four large piles of buildings, devoted to the exchange, chambers of commerce, museum, and collection of arts and science (with some remarkable specimens of Roman antiquity), schools of drawing and natural history, agricultural and other societies, depot of machines for the silk manufacture, &c., and to a public

library, which is one of the best provincial libraries in France. Another celebrated public building is the Hôtel-Dieu, which was founded by Childebert and his queen in the 6th century, and consists of a series of buildings extending along the Rhône. The hospital of Antiquailles occupies the site of the ancient palace of the Roman emperors, and is devoted to lunatics and incurable diseases. The cathedral or church of St. John is a remarkable Gothic edifice; the church of St. Nizier is an elegant building of the 14th century; that of Ainay, and the churches of the Cordeliers and of St. Paul, are among the other interesting ecclesiastical structures. Lyons has about 30 Roman Catholic churches and chapels, four Protestant places of worship, and a synagogue. It is the seat of an archbishop, and has an academy,

with faculties of Catholic theology, science, and literature; a lyceum, a veterinary school, many educational and charitable institutions, and a *mont de piété*. It has a branch of the bank of France, and a great number of courts of justice, among which is a *conseil des prud'hommes*, a commercial tribunal, composed half of masters, half of workmen, designed to settle in a conciliatory spirit disputes respecting wages and other matters. The fortifications consist of 18 detached forts arranged in a circle of about 18 m. round the city, crowning the hills of St. Croix and Fourvières on the right bank of the Saône, and of La Croix-Rousse above the suburb of that name. They have been built since 1834, in consequence of the outbreaks of that year and of 1831. The chief work, Fort Montessay, has full command



Lyons.

of the turbulent suburb of La Croix-Rousse, which may be entirely cut off from the city by a fortified barrack on the Place des Bernardines.—The jewellers and goldsmiths of Lyons transact a large business. In the sham jewelry trade Lyons ranks next to Paris. Carriages, glass and crystal, various kinds of acid, archil, soft soap, indigo, liqueurs, iron and machinery, leather, colored paper, &c., are all manufactured to some extent in Lyons; its beer is celebrated; the production of felt hats has declined; its dye houses for cotton, silk, and wool are of great importance; woollen shawls are extensively manufactured. All these branches of industry, however, are overshadowed by the silk manufactures. They were introduced into Lyons during the reign of Louis XI. by merchants of Florence and Lucca, and great factories were established in 1536 by Genoese manufacturers. From 1650 to 1680

the silk industry employed from 9,000 to 12,000 looms. After the revocation of the edict of Nantes, when many of the most skillful weavers went into exile at London, Crefeld, and other places, the number declined to about 4,000. It rose to 18,000 in 1788, was reduced to 3,000 or 4,000 by the revolution, but has since steadily increased; and in 1873 the number of looms in the city and its vicinity was estimated at 70,000, and the number of hands employed at 140,000, of whom about one half were in the city. The average annual value of the silk manufactures was estimated at \$76,000,000, and the value of the raw silk imported at \$60,000,000. Silk weaving is not conducted in factories, but in the dwellings of the master weavers, each of whom has usually from two to eight looms, which with the greater portion of their fittings are his own property. He and his family keep as

many of the looms at work as they can, and employ *compagnons* for the remainder. The latter are not permanent residents, but remain in the city only while there is a demand for their labor. Apprentices and *lanceurs* (children who prepare bobbins, &c.) constitute the rest of the operatives. The silk merchants supply the raw silk and the patterns to the owners of the looms, to whom is intrusted the task of producing the web in a finished state. Half the wages paid by the silk merchants go to the owners of the looms and half to the laboring weavers. Most of the raw silk reaches Lyons through London, and some also *via* Paris and Marseilles. A school of art (*institution de la Martinière*), to which a professor is attached who teaches the adaptation of designs to the loom, or the *mise en carte*, and which gives free instruction in drawing and modelling to about 200 pupils, has done much to improve manufacturing skill. The demand from the United States has given a great impulse to the silk industry of Lyons, and led to the manufacture of a cheaper but strong kind of fabric. In connection with the silk trade is an establishment in the *palais des beaux-arts*, called the *condition*, where, by the agency of heat, the unwrought silk is reduced to an equable weight and dryness. The weavers are imperfectly educated, but are not much addicted to intemperance. Continuous hard labor, however, has degraded them physically; they are subject to scrofulous and spinal diseases and rheumatism, and many of them are exempted from military service on account of debility or deformity. The upper and middle classes of Lyons are thriving, and include many families of great wealth. The neighborhood of the city is adorned with a great number of beautiful villas. One great drawback to the more rapid increase of the industrial establishments is the want of coal. The deficiency of water has been remedied since 1856 through the operations of the great water works company, in connection with the canalization of France. The same company has also introduced a better system of sewerage.—The ancient city of Lugdunum was mainly built on the hill of Fourvières (anc. *Forum Vetus*). Munatius Plancus, governor of Gaul, founded there a colony as early as 43 B. C. Augustus, under whom it became the capital of the province (Gallia Lugdunensis), established there a senate, a college of magistrates, and an athenæum. It also became the centre of the four great Roman roads which traversed Gaul. Caligula instituted there games and festivals. Claudius, who was born there, gave to Lugdunum the privileges of a Roman city. In A. D. 58 it was destroyed by fire, but rebuilt by Nero. Trajan, Hadrian, and Antoninus erected in the city many monuments, and annual fairs were established. Having declared for Albinus, it was pillaged by his rival Septimius Severus after his victory near the town (197). Several martyrs were put to death during the persecutions against the Christians,

St. Pothinus among the number, and according to later writers also St. Irenæus. Attila desolated the city in the middle of the 5th century, when most of the great Roman monuments were destroyed, although a few relics of them still remain. From that time until the beginning of the 14th century the city was successively under the sway of the Burgundians, Franks, German emperors, and its feudal archbishops and municipal council. Under Philip the Fair it was annexed to France. During the following period the city acquired great celebrity by its trade and industry. It was fortified by Francis I., and embellished with quays and fine edifices under Louis XV. The citizens manifested great enthusiasm in behalf of the revolution of 1789, and subsequently embraced the Girondist party. Afterward they rose against the convention, killing the president of the Jacobin club (Challier), and the city was subjected to a siege by a republican army under Kellermann at the beginning of August, 1793, and compelled to surrender after a heroic resistance of two months. As a punishment the convention doomed the city to destruction. Collet d'Herbois and Fouché were sent there as commissioners; the city and its environs were deluged with blood, and several thousand persons were put to death. Under the reign of Napoleon I., when the loom of Jacquard, a native of Lyons, was introduced, the city recovered its prosperity; but it was again shaken in 1814 and 1815, and still more seriously by the commercial crisis which followed the revolution of 1830. A strike for higher wages produced in November, 1831, a terrible insurrection. The operatives seized the hôtel de ville, but evacuated it on the arrival of Marshal Soult and the duke of Orleans. A formidable political outbreak in April, 1834, could only be quelled after several days' fighting in the streets. A new calamity was added by the inundation of 1840. The revolution of 1848, however, did not create any great disturbances. In 1856 Lyons was desolated by another inundation. During the war of 1870-'71 it was repeatedly the scene of popular commotions, which were however easily checked. The radical spirit of the masses manifested itself after the war chiefly under the mayoralty of Barodet, and in the election of Ranc to the national assembly in May, 1873.

**LYONS**, a town and village, capital of Wayne co., New York, on the Erie canal and the New York Central railroad, 44 m. W. of Syracuse, and 36 m. E. of Rochester; pop. of the town in 1870, 5,115; of the village, 3,350. The village contains a handsome court house, a national bank, 20 peppermint distilleries, several manufactories, a graded public school, two weekly newspapers, and seven churches. The annual production of oil of peppermint amounts to 100,000 lbs., and there is considerable trade in tobacco, grain, cider, apples, and other fruit.

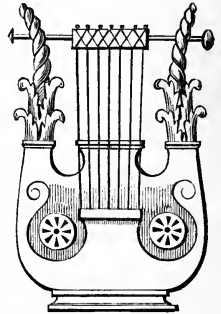
**LYONS**, Gulf of (Fr. *golfe du Lion*; anc. *Gallivus Sinus*, also *Mare Gallicum*), a gulf of the

Mediterranean, on the S. E. coast of France, between a range of the Pyrenees on the west and a headland near Toulon on the east, washing the shores of the departments of Var, Bouches-du-Rhône, Gard, Hérault, Aude, Pyrénées-Orientales, and the N. E. coast of Catalonia in Spain. It extends from the isles of Hyères to Cape Creux for about 165 m., with a breadth of nearly 100 m. The Rhône, Hérault, Aude, and some other rivers flow into the gulf. The principal places on its coast line are Marseilles, Toulon, and Cette. The shores are in many parts intersected by extensive lagoons and low islands, and the gulf is frequently subjected to violent gales. It is said to have been named from the lion, in consequence of its fury.

**LYONS, Edmund**, Lord Lyons of Christchurch, a British admiral, born at Burton, Hants, Nov. 21, 1790, died at Arundel castle, Sussex, Nov. 23, 1858. His ancestor, Henry Lyons of Antigua, and some time of Philadelphia, married a daughter of Samuel Winthrop, grandson of John Winthrop, first governor of Massachusetts. As early as his eighth year he accompanied Sir Richard Bickerton on a cruise at sea, and three years later entered the yacht Royal Charlotte as a volunteer. In 1803 he received his midshipman's warrant, and for several years saw much active service in the Mediterranean. In the latter part of 1808 he went to the East Indies, was soon after appointed acting lieutenant in the brig Barracouta, and participated in several brilliant exploits. Subsequently, in the command of a flotilla of gunboats, he rendered efficient service; but he was compelled by sickness soon after to return to England, where in 1812 he was made commander, and two years later post captain. In 1828 he was appointed to the Blonde, with which he took part in blockading Navarino, and which was the first English man-of-war that ever entered the Black sea. After much important service, including 12 days in the trenches before the Morea castle, the last stronghold of the Turks in the Peloponnesus, he was employed, on the formation of the independent kingdom of Greece, to convey King Otho and his suite to Athens. He was knighted and appointed British minister at the new court, where he resided for 14 years. In February, 1849, he became British minister at Bern, and in 1851 at Stockholm. In October, 1853, he was appointed second in command of the fleet destined to operate in the Black sea, under Admiral Dundas, on whose retirement in December, 1854, he succeeded to the chief command. He performed many brilliant naval services, and during the siege, whenever the opportunity was afforded, he was constantly riding along the lines in front of Sebastopol, and participating in military operations. His return to England was the occasion of numerous ovations, and on June 23, 1856, he was called to the house of peers as Baron Lyons of Christchurch.—His son, **RICHARD BICKERTON PEMELL**, second Lord Lyons, born April 26,

1817, was envoy extraordinary to the United States from 1859 to 1864, afterward ambassador to Turkey, and since 1867 has been ambassador to France.

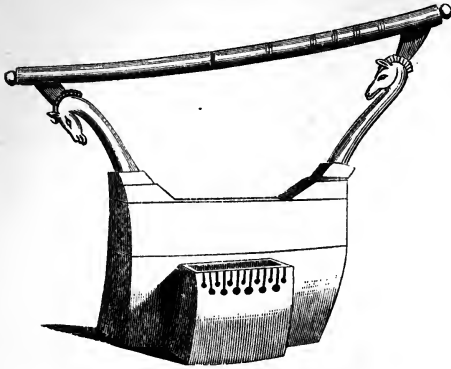
**LYRE** (Gr. *λύρα*), one of the most ancient and famous of the family of stringed instruments, the origin of which is lost in antiquity. It was familiar to the Egyptians, and to the nations of western Asia, by whom it was introduced among the Greeks. The latter, however, had a special tradition which attributed its invention to Mercury, who is described in the Homeric "Hymn to Mercury" as forming a lyre out of the shell of a tortoise which he caught at the entrance of the cavern within which his mother Maia had a few hours previous given birth to him. The instrument as there described seems to have been identical with that to which the name cithara (*κithάρα*) was subsequently given, and re-



Greek Heptachord.

sembled the modern guitar in having the strings drawn across the sounding bottom. In the lyre of later times they were free on both sides. Concerning the original number of strings there are many opinions; but from the fact that, in the earlier part of the 7th century B. C., Terpander of Antissa added to the instrument three new strings, thus constituting it a heptachord, there is reason to believe that the lyre of Mercury could not have had more than four, and lyres with three strings were undoubtedly used in some parts of Greece. This heptachord, embracing a compass of an octave, was that most commonly used among the Greeks, and subsequently among the Romans, for many ages; although gradually new strings were added and various modifications effected in the shape of the instrument. In Pindar's time lyres were made with eight strings; Timotheus of Miletus increased the number to eleven; and as early as the age of Sappho and Anacreon, a variety of instruments of the lyre species, introduced from Asia Minor, such as the *magadis*, *barbiton*, and others, were in use in Greece, some of which had a compass of two octaves and more than 20 strings. About the time of Pindar the lyre seems to have first become distinct from the cithara, and on account of its fuller and deeper tone was employed in recitations of epic poetry and other compositions of an elevated character. It consisted of a tortoise-shell sounding bottom, from which rose two horns (*πῆχυν*), the one shaped like the letter S, and the other like the same letter reversed, connected near the top by a transverse piece of wood, to which were fastened the upper ends of the strings,

stretched perpendicularly from the bottom. When played, it was placed in an upright position between the knees, while the cithara rested upon the knees, and the sounds were pro-



Egyptian Lyre in the Berlin Museum.

duced by the *plectrum*, or lyre stick of ivory or polished wood, in the hands of the performer, and sometimes by the fingers alone. The Egyptian lyres, constructed on a similar principle, though less elegant in form, were of considerable power, having 5, 7, 10, and 18 strings, and were played in a similar manner. In the Berlin museum is a well preserved one pierced for 13 strings. The lyre, though invented by Mercury, became the peculiar instrument of Apollo, the tutelary god of music and poetry, and was employed to perform the prelude to recitations of epic poetry, and to fill up pauses between the parts. It also gave its name to that species of poetry called lyric, to which it originally furnished an accompaniment.

**LYRE BIRD**, a large tenuirostral passerine bird, of the family *certhiadae* or creepers, and



Lyre Bird (*Menura superba*).

subfamily *menurinae* or wrens, according to Gray; and of the family *eriodoridae* of Cabanis.

Only two species of this singular bird are described, both natives of Australia, constituting the genus *menura* (Davies). The common lyre bird (*M. superba*, Dav.) from the form of the legs has been placed among the gallinaceous tribes, and its name of wood pheasant indicates its general resemblance to these; it has also been ranked with the hornbills among the *conirostres*, and by others in the neighborhood of the thrushes; but it seems most nearly allied to the wren family. The length is about 43 in., of which the tail is 25; the bill is rather more than an inch long, resembling that of a peacock, strong, keeled, broad at the base, and of a black color; the nostrils are long and narrow, in a fossa near the middle of its length; the wings moderate and rounded; the body about the size of that of a pheasant; tail very long, and of a singular form, differing in the two sexes; tarsi long and robust, covered with broad scales in front; toes and claws long and strong, fitted for scratching; orbital region naked. The general color above is brownish black, and grayish brown below; the head slightly crested, and the throat rufous; there are three kinds of feathers in the tail, which are long and 16 in number; 12 have long slender shafts, with delicate filaments more and more distant toward the end; the middle two feathers, longer than the rest, are pointed at the end and barbed only on the inner edge; the external two feathers are broad, growing wider to the ends, and curving outward like an elongated S, the two resembling much the outline of the ancient lyre; the curved part is black with a narrow white border, and pearly beneath with bright rufous spots on the inner web. They are shy, running rapidly among the brush wood, and scratch for slugs, beetles, and insects, generally among the fallen leaves; they fly but little. They live in pairs in rocky places overgrown with bushes; their motions are graceful, the males strutting and displaying the tail feathers like a peacock; the voice is very varied and pleasing, especially in the morning and evening; the nest is made of roots and moss, shaped like a basin and roofed; the eggs are said to be only two in number. The second species (*M. Alberti*, Gould) is smaller, with a shorter tail, and with the outer feathers shorter than those succeeding them internally. They represent the rasorial type of the *passeres*.

**LYSANDER**, a Spartan soldier, killed in battle in 395 B. C. There is no mention of him in history till 407 B. C., when he succeeded Cratesippidas as navarch or commander of the Spartan fleet in the *Ægean*. Having increased his fleet to 70 ships, by contingents from the insular and Asiatic allies of Sparta, and obtained pecuniary assistance from Cyrus, recently appointed satrap of Ionia, he defeated the Athenian fleet off Notium, in consequence of the rashness of Antiochus, whom Alcibiades had intrusted with its temporary command. Lysander's term of service having expired, he



was succeeded in 406 by Callicratidas, who was killed at the battle of the Arginusæ. The allies of Sparta then urged the reappointment of Lysander; but as the Lacedæmonian law did not allow the office to be held twice by the same person, he was named vice admiral, virtually with the chief command, though nominally subordinate to Aracus. He at once proceeded to Ephesus, gathered a powerful fleet, established his personal authority in Miletus, took Cœdræ in Caria and sold its inhabitants into slavery, and carried Lampsacus by storm. The Athenian armament soon arrived, and fixed its station at Ægospotami, on the opposite side of the Hellespont. It consisted of 180 ships, under the command of ten generals, none of whom except Conon was qualified for his position. Over against the Athenians in the harbor of Lampsacus lay the Spartan fleet. For four successive days the Athenian commanders sailed across the intervening sea, with their ships in battle array, and dared their enemy to come out of his harbor. On the fifth, when the Athenians, grown presumptuous, had beached their triremes, Lysander rowed swiftly across the Hellespont, and captured the entire navy of Athens, with all its seamen, except eight or nine galleys that escaped with Conon to Cyprus, and the sacred ship Paralus that bore to Athens the intelligence of the disaster. This catastrophe decided the fate of Athens, which surrendered to Lysander early in 404, and also brought to a close the Peloponnesian war. He was now by far the most powerful man in Greece, and the pride and arrogance natural to him were manifested in the most unrestrained manner. A residence in Sparta was no longer tolerable to him, nor did he return thither till recalled by the ephori to answer for his misconduct in Asia. After the accession of Agesilaus he was appointed one of the 30 councillors who were to accompany that king in his expedition to the East; but his arrogance soon destroyed whatever influence he may have had with Agesilaus, and at his own request he was sent to superintend affairs in the Hellespontine cities. In 395 he was placed in command of a military force which was destined to coöperate with the army of Pausanias in reducing the Bœotians and their allies. He entered Bœotia and laid siege to Haliartus, but was surprised by the Thebans under the walls of that city, and slain. It is said that at the time of his death he was involved in a conspiracy which had for its object the destruction of the exclusive right of the Heraclidæ to the throne of Sparta.

**LYSIAS**, an Athenian orator, born in Athens in 458 B. C., died there in 378. In 443 he emigrated with an Athenian colony to Thurii in Italy, and there completed his education. After the destruction of the Athenian armament in Sicily (413), he and 300 others were expelled from Thurii by the partisans of Sparta. He returned to Athens in 411, where he was imprisoned as an enemy of the oligarchs,

and had he not contrived to effect his escape would probably have been put to death. When Thrasybulus was organizing at Phyle that band of patriots with which he restored liberty to Athens, Lysias, then sojourning at Megara, sent him money, arms, and mercenaries. On the overthrow of the tyranny of the thirty he returned to Athens (403), and thenceforth chiefly devoted himself to the composition of speeches for parties engaged in litigation, sometimes however pleading in person. There formerly existed over 400 orations ascribed to him, but only 230 of these were admitted to be genuine. The number now extant is 35. None delivered by himself, save that against Eratosthenes, have come down to us. The best editions of his remaining works are by J. Taylor (London, 1739), Förtsch (Leipsic, 1829), and Franz (Munich, 1831). There is an English translation of some of his principal orations by Dr. Gillies.

**LYSIMACHIA** (Gr. *λύσις*, release from, and *μάχη*, strife, or in honor of King Lysimachus), a genus of plants of the natural order *primulaceæ*. They are herbaceous, perennial, and have entire leaves and axillary or racemed, mostly yellow flowers. Species are found in almost all parts of the world, and there are several in the United States. Some are cultivated as garden plants, the most popular of these being the moneywort (*L. nummularia*), with a prostrate, creeping stem, opposite, roundish leaves, solitary axillary flowers, and ovate acute sepals. It is a pretty plant for covering rock work, or for cultivating in a wire basket, or some hanging ornamental design from which its pendent stems can droop. It is an excellent plant for carpeting the soil beneath shrubs, as it soon forms a dense, closely clinging mat. In some places this has escaped from cultivation and become thoroughly naturalized. Within a few years a variegated form has appeared, an unhealthy-looking plant, with dull yellow leaves. Several others, as *L. thyrsoiflora*, are in cultivation, but are rarely seen in our gardens.



Moneywort (*Lysimachia nummularia*).

Among our native species is one with a tall stem on which the leaves are arranged in

whorls in fours and fives, and with graceful, yellow flowers protruding from their axils; it is the *L. quadrifolia*, common in moist or sandy soils. Another, with an erect stem, growing 2 or 3 ft. high, with opposite, heart-oval leaves supported upon ciliate footstalks, and with large showy flowers, is *L. ciliata*. A southern species somewhat similar, but with leaves and flowers not more than half the size, is the *L. radicans*; it grows upon swampy river banks in western Virginia and southward. The long-leaved loosestrife (*L. longifolia*) is to be found from western New York to Wisconsin. The native species are all easy of cultivation, and most of them are pretty garden border flowers. The common name, loosestrife, is applied to the wild and some of the cultivated species of this, as well as to *lythrum*; according to one of the derivations above given, the name should properly belong to this; Pliny is quoted as authority for the statement that the common European loosestrife (*L. vulgaris*), if laid upon the yoke of quarrelling oxen, will quiet them.

**LYSIMACHUS**, a Greek general, king of Thrace, born in Pella, Macedonia, about 360 B. C., slain in battle in 281. He was the son of Agathocles, a Thessalian, and was early distinguished for valor, activity, and bodily strength. On the division of the provinces, after the death of Alexander (323), Thrace and the region bordering on the Danube were allotted to him. In 315 he joined the coalition formed against Antigonus by Ptolemy, Seleucus, and Cassander. In 306 he assumed the title of king. In 302 he invaded Asia Minor, overran Phrygia, and reduced several of the Hellespontine cities. On the approach of Antigonus, however, he retired into Bithynia, where he was joined by Seleucus, and the two confederates advanced in the spring of 301 against Antigonus and his son Demetrius. At the battle of Ipsus, which ensued soon after, Lysimachus and Seleucus, aided by the forces of Ptolemy and Cassander, completely vanquished their antagonists, and shared between them the dominions of Antigonus. Of the territory which accrued to the king of Thrace in consequence of this victory, he retained possession almost until his death, rebuilding the cities in it that had been ruined during the war, and so improving and enlarging New Ilium and the Mysian Alexandria that he came to be regarded as their founder. In 292 he undertook an expedition against the Getæ north of the lower Danube, and was compelled by famine to surrender with his whole army, but was soon set at liberty. In 288 he formed a confederacy with Ptolemy, Seleucus, and Pyrrhus against Demetrius Poliorcetes (who had invaded Thrace during his absence and captivity), the result of which was that the latter lost his kingdom of Macedonia, and that Lysimachus presently got possession of it. Having consented to the death of his son Agathocles at the instigation of Arsinoë, daughter of Ptolemy, whom he

had recently married, his Asian subjects rebelled; and Seleucus, to whose court the widow of Agathocles had fled, marched to their aid. The hostile monarchs (the two last survivors of the generals of Alexander, and both almost octogenarians) met on the plain of Cornus, in Phrygia, and in the battle which ensued Lysimachus was defeated and slain.

**LYSIPPUS**, a Greek sculptor, of Sicyon in the Peloponnesus, flourished in the latter part of the 4th century B. C. He was originally a workman in bronze. Alexander the Great ordered that no one should paint him but Apelles, no one make his statue but Lysippus. He made statues of Alexander at all periods of his life, and in various positions, and the equestrian statues of 25 Macedonian chieftains who fell at the battle of the Granicus. There is a tradition that the celebrated horses of Venice formed a part of this group. Lysippus probably worked exclusively in bronze, and according to Pliny executed 1,500 pieces of all kinds. Among the most celebrated were several statues of Jupiter, including the colossal one at Tarentum, 60 ft. in height; several of Hercules, one of which is supposed to have been the original from which the "Farnese Hercules" was made by Glycon; the sun drawn in a chariot by four horses at Rhodes; "Opportunity," a youth with wings on his ankles, in the act of flying from the earth; and a statue representing a bather scraping himself with a strigil, called Apoxyomenos, which the emperor Tiberius caused to be removed from the baths of Agrippa to his own palace. Lysippus departed in various particulars from the proportions observed by his predecessors, giving his figures smaller heads and more slender bodies. In the elaboration of individual parts he was unsurpassed, and particularly in the execution of the hair.

**LYTHRUM** (Gr. *λύθρον*, gore, from the color of the flowers in some species), a genus of herbaceous plants belonging to the natural order *lythraceæ*, generally with opposite, entire leaves, no stipules, axillary or whorled flowers; seeds many, without albumen, and enclosed in a two-celled pod. The lythrums are usually called loosestrifes, a name which they share with the lysimachias, though the two are botanically very distinct. The purple loosestrife (*L. salicaria*, Linn.) is a native of Europe, but is to be found in some of the older states in wet meadows; it is a fine, tall, more or less downy plant, with large purple flowers. It is remarked abroad that the color of the flowers varies there from crimson to purple, and that the foliage, though usually smooth and green, becomes hoary and downy if the plant grows in dry places; its stature also is much dwarfed in consequence. It is sometimes cultivated for its beauty, blossoming in midsummer. There are several North American species. The *L. hyssopifolia*, or hyssop-leaved loosestrife, with a low stem 6 to 10 in. high, numerous oblong-linear leaves, and inconspicuous pale purple

flowers, is found near salt marshes on the coast of New England and New Jersey; *L. alatum* and *L. lineare* are other native species. The lythrums are easy of cultivation by sowing their seeds, or by division of the roots of the



Spiked Lythrum.

perennial species. The purple loosestrife is mucilaginous and astringent, its decoction being blackened by sulphate of iron. It may be used in diarrhoea and chronic dysentery, &c.; the dose of the powdered herb is about a drachm two or three times a day; a decoction of an

ounce to the pint may be given in the dose of two fluid ounces. The petals of the flowers of *L. Hunteri* are used in India for dyeing. The order of *lythraceæ* contains many plants of decided utility. The crape myrtle (*Lagerstræmia Indica*), a small shrubby plant with elegant crimped petals of a rosy red color, and much admired, belongs to this order, as also the henna plant of Egypt. (See HENNA.)

**LYTTELTON, George**, lord, an English author, born at Hagley, Worcestershire, Jan. 17, 1709, died there, Aug. 22, 1773. He was a member of an old family of considerable property, and was educated at Eton and Oxford, and entered parliament in 1730. In 1737 he was appointed secretary to Frederick, prince of Wales, and in 1744 a lord commissioner of the treasury. In 1754 he was sworn a member of the privy council, in 1755 was made chancellor of the exchequer, and on Nov. 19, 1756, was elevated to the peerage as Baron Lyttelton of Frankley. The last ten years of his life were spent chiefly in retirement and literary pursuits. His principal works are: "History of the Life of King Henry II. and of the Age in which he lived" (4 vols. 4to, London, 1764-'7); "Observations on the Conversion and Apostleship of St. Paul" (1747); and "Dialogues on the Dead" (4th ed., 1765). His correspondence, with a memoir, appeared in 1845.—His son THOMAS, second Baron Lyttelton, a young man of much ability, was supposed by some to have been the author of the "Letters of Junius." He died in 1779 from dissipation and profligacy.

**LYTTON-BULWER.** See BULWER-LYTTON.

## M

**M**, THE 13th letter and the 10th consonant of the English alphabet. The form of the character, like that of the other English letters, is ultimately derived, though with important modifications, from the ancient Phœnician. Its position between L and N is also derived from the ancient Semitic; as in the 119th Psalm, where *mem* is preceded by *lamed* and followed by *nun*. The name *mem* in Hebrew, like the word *mayim*, probably signified water, the Ethiopic name of the letter, as well as of water, being *mai*. The letter M in English has in all positions one uniform, well known sound. It is often called a liquid or semi-vowel, and is a labial nasal, having the same relation to the labial mutes as *n* to the lingual mutes, and *ng* to the palatal mutes. The sound of M is one of the easiest to articulate, and is therefore one of the first uttered by children. It is found in nearly all known languages, and in most of them is a prominent letter in the words for mother (*mam*, *mamma*), as Sans. *mātā*, Gr. *μήτηρ* (Dor. *μάτηρ*), Lat. *mater*, Ger. *Mutter*, Slav. *matka*, Armen. *maïr*, Heb. *em*, Chin. *mu*; for nurse, as Ger. *Amme*, Slav.

*mamka*; and for breast, as Lat. *mamma*, Gr. *μάμη* or *μάμμα*, Armor. *mamm*. The English sound of M is that which belongs to it also in most of the European languages. In French and Portuguese, however, at the end of a word, and in most cases at the end of a syllable, it loses its sound, and has no other function than to indicate the nasality of the vowel which precedes it. In Latin, *m* final is the more usual characteristic of the accusative singular. The ancient grammarians ascribed to it in this case a different pronunciation from that which it has elsewhere. The obscurity of this sound, perhaps only indicating the nasality of the vowel, still appears from the fact that in Latin verses *m* final, followed by a word beginning with a vowel, does not prevent the elision of the preceding vowel. For the most part, the sound of M has come down unchanged from the earliest times. It is in almost every instance an original sound; as for instance, Eng. *mete*, Anglo-Sax. *metan*, Mæso-Goth. *mitan*, Lat. *metior*, Gr. *μετῖον*, Sans. *ma*, Heb. *madad*, Arab. *medda*. The following are the principal exceptions, made for euphony: 1. In words of

Latin origin, *n* assimilates itself to a following *m*, as *immense*, *immerse*, *commute*, for *inmense*, *inmerse*, *commute*. So in words from Greek, *n* or a labial sometimes assimilates itself to a following *m*, as *symmetry* for *synmetry*, *lemma* for *lepma*; so also *d*, as *ammunition* for *admunition*. 2. In words both of Latin and Greek origin, *n* sometimes conforms itself to a following labial, by becoming *m*; as *imbibe*, *impend*, *embark*, *combine*, *emblem*, *symbol*, *sympathy*. 3. In words of Teutonic origin, *n* becomes *m* before a labial; as Lat. *cannabis*, Ger. *Hanf*, Eng. *hemp*. Where *m* is now silent, as in the word *mnemonics*, it once had its appropriate sound.—The Greek and Hebrew *M*, as a numeral, denoted 40. The Roman *M*, probably as the initial of *mille*, denotes 1,000; and this is its numerical value in English.

**MAAS.** See *MEUSE*.

**MAB**, a fairy, celebrated by Shakespeare and other English poets. The name is of uncertain origin, being variously derived from the Midgard of the Eddas, the Habundia or Dame Abonde of Norman fairy lore, and from the Cymric *mab*, a child. According to Voss, Mab was not the fairy queen, the same as Titania, this dignity having been ascribed to her only by mistaking the use of the old English word *queen* or *quean* (A. S. *coen* or *quena*), which originally meant only a woman. Queen Mab is mentioned in Shakespeare's "Romeo and Juliet," Ben Jonson's "Satyr," Randolph's pastoral of "Amyntas," Drayton's "Nymphidia," and Milton's "L'Allegro."

**MABILLON, Jean**, a French author, born at St. Pierre-du-Mont, Champagne, Nov. 23, 1632, died in Paris, Dec. 27, 1707. Having joined the Benedictines of St. Maur, he was chosen to assist Dom Jean d'Achéry in the compilation of his *Spicilegium Veterum Scriptorum*, and subsequently edited the works of St. Bernard (2 vols. fol., and 9 vols. 8vo, 1667; 2d ed., 1690) in the series of the fathers published by his congregation. In 1681 he published *De Re Diplomatica*, a work which is sometimes regarded as entitling him to be called the founder of the school of antiquarian historians. The ability displayed in this work induced the minister Colbert to offer him a pension of 2,000 livres, which he refused, asking that the royal munificence might rather be shown to his order. In 1683 he was sent to Germany by Louis XIV. to collect documents relating to French history; and the applause with which his *Iter Germanicum*, a narrative of the journey, was received, induced the king to send him to Italy in 1685 to make purchases for the royal library. A result of this tour was his *Museum Italicum* (1687-'9), containing an account of the places which he visited, the rare treasures of some of the libraries, and the ceremonies of the church, besides several learned historical dissertations. Soon afterward he was selected by his superiors to refute Rancé, abbot of La Trappe, who in a recent work had condemned the custom of permitting monks

to study. Mabillon's *Traité des études monastiques*, which appeared in consequence in 1691, was equally remarkable for sound argument and good temper. His other most important works are *Vetera Analecta* (4 vols. 8vo, 1675-'85), and *De Liturgia Gallicana* (1685). He edited and published with Ruinart *Acta Sanctorum Ordinis Sancti Benedicti*, commenced by D'Achéry, and published the first 4 vols. of the *Annales Ordinis Benedictini* (6 vols., Paris, 1703-'39). A collection of his *Ouvrages posthumes* (3 vols. 4to, Paris) appeared in 1724.

**MABLY, Gabriel Bonnot de**, a French publicist, born in Grenoble, March 14, 1709, died in Paris, April 23, 1785. His family name was Bonnot. Like his younger brother, the philosopher Condillac, he was destined for the church, and was ordained, but was secretly employed in affairs of state by his relative Cardinal de Tencin, minister of Louis XV. Quarrelling with his patron, however, he applied himself to literature, and in 1748 published at Geneva his *Droit public de l'Europe*, which achieved a remarkable success. It was followed by *Observations sur les Grecs* (1749); *Observations sur les Romains* (1751); *Entretiens de Phocion* (Amsterdam, 1753); *Principes des négociations* (the Hague, 1757); *Observations sur l'histoire de France* (Geneva, 1765); *De la manière d'écrire l'histoire* (1773); *De la législation* (Amsterdam, 1776); *De l'idée de l'histoire* (1778); and *Principes de morale* (1784). Having been requested by the government of Poland to prepare for them a code of laws, he visited that country in 1771, and published in 1781 a work *Du gouvernement de la Pologne*. He was also consulted by the American congress in 1783 on the preparation of the constitution, and embodied his views in his *Observations sur le gouvernement et les lois des États-Unis d'Amérique* (1784).

**MABUSE, Jan**, a Flemish painter, whose real name was Gossaert, born in Maubeuge, Hainaut, about 1499, died about 1562. He is said to have studied painting in Italy, after which he practised his art in various cities of the Netherlands, leading at the same time a dissipated and scandalous life. During the reign of Henry VIII. he found his way to England, and painted several of the royal family and many persons of distinction. He was the contemporary and friend of Albert Dürer and Lucas van Leyden. His most celebrated picture, the "Descent from the Cross," perished in the fire which destroyed the cathedral of Middelburg, where it was deposited. The finest of the authenticated works passing under his name is "The Wise Men's Offering," now in the possession of the earl of Carlisle.

**MACADAM, John Loudon**, a Scottish engineer, born at Ayr, Sept. 21, 1756, died at Moffat, Dumfriesshire, Nov. 26, 1836. On the death of his father in 1770 he was sent to his uncle William Macadam in New York. During the revolution he was agent for the sale of prizes at the port of New York, an office in which

he made a considerable fortune, the greater portion of which he lost, however, at the peace of 1783, when with the other loyalists of the city he was compelled to abandon America. He returned to Scotland in May of that year, and soon afterward purchased the estate of Sauchrie in Ayrshire. He took a prominent part in the affairs of the county, was in the commission of the peace, a trustee of the roads, and deputy lord lieutenant of the county. It was in the course of his duties as a magistrate and trustee of roads that his attention was first drawn to the subject of road making. In 1798 he was sent by the government to the west of England to regulate and remove abuses in the victualling of the navy, in which service he was kept till 1802, when he removed from Falmouth to Bristol. After 1827 he resided at Hoddesdon, Hertfordshire. From 1798 to 1815 he was engaged during all his leisure in travelling through Great Britain and investigating the condition of the roads. In this investigation, made at his own expense, he travelled 30,000 miles and spent more than five years and £5,000. In 1811 he made a communication to a committee of the house of commons upon the state of the roads of the kingdom, containing the outlines of his system and directions for repairing roads. In 1815 he was appointed surveyor general of the trust or district of roads of Bristol, and in 1816 commenced carrying his system into operation. He met with great opposition from the farmers, traders, and common people, as well as from the employees under the old system; but after the benefits of the system became palpable, the rapidity of its adoption was remarkable. Within four years 700 miles of road in 15 different trusts were made; and within eight years he had given his personal attention and advice and assistance to no fewer than 70 trusts in 28 different counties in Great Britain. In a few years, out of the 25,600 miles of public roads in the kingdom, nearly seven tenths were macadamized; and at his death it is believed that there were not 250 miles of the whole not macadamized. (See ROAD.) Mr. Macadam never demanded nor received any remuneration from the various authorities, committees, and trusts by whom he was consulted, except what was freely tendered; and very many of them never even paid the expenses that they occasioned him. In 1825 the British parliament voted him £4,000 toward paying his expenses, and an additional sum of £2,000 as a consideration for the benefit the nation had derived from his labors and the free gift of his invention. Even this inadequate compensation was never wholly paid. He was at the same time offered knighthood, which he refused; but a similar offer was accepted by his son James, superintendent of the road district of London, who died in 1852.

**MACAFEE, Daniel**, an Irish clergyman, born at Bushmills, county Antrim, in 1792, died in London, Jan. 11, 1873. His parents designed

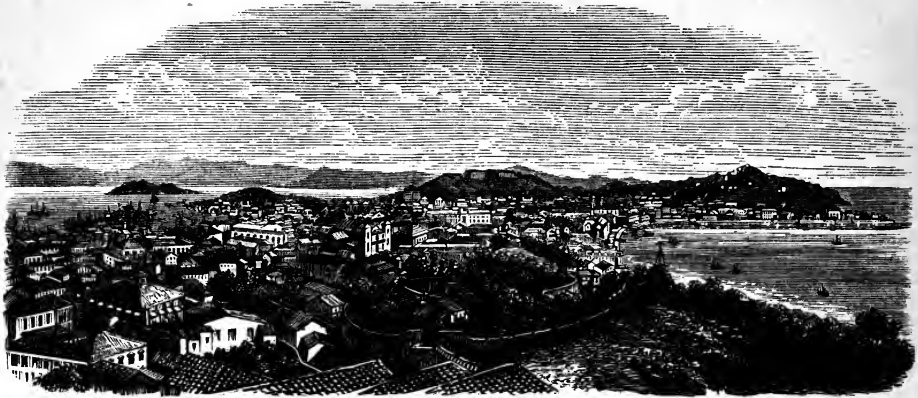
him for the ministry of the Reformed Presbyterian church, but at the age of 14 he connected himself with the Wesleyans. Being prevented by economical reasons from being admitted to the ministry of the latter church, he labored for several years with the Primitive Wesleyans. In 1827, however, he was accepted by the Irish conference, and became conspicuous in that connection. The last years of his life were passed in London in a supernumerary relation. He was the author of numerous polemical writings, chiefly directed against Catholicism and rationalism. A volume of his sermons has also been published.

**MACAO**, a Portuguese dependency and city on the coast of China, at the mouth of the Canton river, in lat. 22° 10' 30" N., lon. 118° 32' E.; area, 12 sq. m.; pop. about 100,000, of whom 90,000 are Chinese, and the remainder a mixed multitude of nearly all nations. The city occupies a peninsula on the S. E. side of the island of Heang-shang. A low narrow isthmus about  $\frac{1}{2}$  m. wide joins this peninsula to the main island. A barrier wall formerly extended across the isthmus, and the Chinese maintained a guard there to prevent foreigners from passing. These have been removed, and no restrictions now exist. The city is built chiefly on the acclivity of two hills around a large semicircular bay. Its whitewashed houses make a pretty appearance from the roadstead, but the streets are narrow, and the Chinese population live in miserable and filthy dwellings. The best part of the place consists of a long line of well built houses on the beach, in front of which is a promenade called the Praya Grande. There are 12 Portuguese churches and several convents. The chief public buildings are the senate house, the governor's palace, and the English factory. On the hills around the city are forts which have an imposing appearance, but are badly armed with worn-out cannon. The principal Portuguese officials are the governor, the judge, and the bishop. There is a college here for the education of Catholic priests, a grammar school in which Portuguese is taught, an English hospital, and several other benevolent institutions. The harbor of Macao has not sufficient depth of water for large vessels, which anchor in the roads E. S. E. of the city and about 5 m. distant. Little shipping is owned in the place, and the trade is carried on almost wholly by Chinese and British merchants. The climate is healthy and temperate, and the city is a favorite resort for invalids from India.—Macao was granted to the Portuguese in 1585 by the Chinese emperor, in reward for their services in repelling the incursions of a Japanese pirate. It had, however, been the seat of a factory before that period, and between 1553 and 1561 was the residence of the poet Camoëns, who held a small judicial office there, and wrote a part of the "Lusid" in a grotto in a garden behind the city. Macao was for a long period the seat of a great trade, not only with China,



but with Japan, the Philippine islands, and Indo-China; but its commerce is much diminished. In 1844 the Portuguese authorities suc-

ceeded in securing from the Chinese government privileges similar to those given to the English in China. In 1845 the port was de-



Macao.

clared open to foreigners; but the Chinese were subjected to a tariff until 1849, when the port was made free to all traders, and a tax on native houses was laid as a measure of compensation, which drove away many Chinese. The opening of the Yang-tse and the northern ports also affected its trade materially. The principal exports are tea, rice, aniseed, and cannella; imports, opium, cotton, and silk. Most of the revenue is derived from licensing gambling houses and other places of ill repute. For several years the principal business of Macao was the shipment of coolies; in 1870, 10,813 were shipped to Peru and 5,705 to Cuba. The Chinese government long allowed this trade to be carried on without interference, but at length took measures to prevent it, and in 1874 it was abolished by the Portuguese authorities.

**MACAPÁ**, a town of Brazil, in the province of Amazonas, on the left bank and 130 m. from the mouth of the Amazon, 1,690 m. N. N. W. of Rio de Janeiro; pop. 7,500. The streets are regular and spacious, and the houses well built of brick and covered with tiles. It has a parish church and school house, a town hall, a prison, and a hospital; and the harbor, which is commodious, is defended by a fort, which also commands the passage of the river. Rice, millet, cotton, manioc, cacao, and other spontaneous tropical fruits, and fine cabinet woods, are exported.

**MACAQUE**, a name given to several quadrumanous animals intermediate between the long-tailed monkeys and the baboons, constituting the genus *macacus* (Lacép.), characterized by a facial angle of  $40^\circ$  or  $45^\circ$ , elongated muzzle, distinct superciliary ridges, long and large canines, short tail, and rather compact form. The common macaque (*M. cynomolgus*, Lacép.) is olive-brown above and grayish white below, with black feet; it inhabits the interior of Africa, and, according to Geoffroy, the island

of Java. It has the coloring and the comparatively long tail of the guenons, but the heavy and strong form of the baboons; the general position is on all-fours or seated on the ground, taking food either by the hands or immediately by the mouth, and filling the ample cheek pouches before swallowing anything. The wanderer, or lion-tailed monkey (*M. Silenus*, Lacép.), from the Indian archipelago, is black above, with grayish longer hair on the back of the neck and a gray beard; under parts gray; tail with a tuft at the end; it is about as large as a spaniel dog, living in the woods, feeding on roots and leaves, and of harmless disposition. The

Pig-tailed Macaque (*Macacus nemestrinus*).

pig-tailed macaque (*M. nemestrinus*, Geoffr.), from Java and Sumatra, is deep brown above, with a black dorsal stripe, tail slender and reaching to the middle of the thigh, and limbs yellowish. Some of these macaques have been placed in the genus *inuus* (Cuv.), which in-

cludes the Barbary ape, or magot (*I. sylvanus*, Geoffr.), the tailless species living wild upon the rock of Gibraltar, and being the only monkey found in Europe. This, with the last named species, leads to the *cynocephali* or dog-faced baboons. These monkeys are fre-



Barbary Ape (*Inuus sylvanus*).

quently seen in menageries, and when young are easily tamed; less active and stronger than ordinary monkeys, they have not the ferocity and disgusting habits of the baboons. (See APE, and BABOON.)

**MACARONI** (Ital. *maccheroni*), a peculiar paste or dough prepared from wheat flour and manufactured into tubes, ribbons, or threads. It is an Italian invention, and, though made by a simple process, has never been produced with so great success in any other country. The samples from France at the great exhibition of 1851 were nearly equal to those from Italy; the English samples were inferior. The grain grown in the more southern countries of Europe is said to possess a greater amount of gluten, and is therefore better adapted to this manufacture. The wheat, after being washed in the mountain streams, is freed from the husks and ground in water mills, when hot water is added till it is of the consistency of stiff dough. Five different qualities of flour are obtained by an equal number of siftings, the last giving the finest and most delicate that can be made. It is kneaded by means of a wooden pole attached to a post fixed in the ground, and worked up and down as a lever, under one end of which the paste is placed; or by another and less agreeable process of piling up the dough and treading it out with the feet, after which it is rolled with a heavy rolling pin. To reduce the dough to cylinders or ribbons, an iron vessel is used, having the bottom perforated with holes or slits. When this is filled with the paste, a heavy iron plate is driven in by a powerful press, which forces the paste through the holes, and gives it the

shape of the perforations, the workman cutting off the pieces of the desired length as they come through. To produce a hollow cylinder, or tube, a wire suspended from above passes down through the round hole in the vessel. During this process it is partially baked by a fire made under the vessel. Sometimes the flat pieces are formed into tubes by uniting the edges before they are thoroughly dry. After being hung up for a few days they are ready for use. The largest cylinders are called *maccheroni*, the smaller *vermicelli* (little worms), and the smallest *fedelini*.

**MACARONIC POETRY**, originally a species of verse in which words of a modern language furnished with Latin terminations were intermingled; afterward, in general, any verses exhibiting a medley of languages. The invention of macaronics is usually attributed to Teofilo Folengo, called Merlino Coccajo (1491-1544), a learned and witty Benedictine, and friend and contemporary of Sannazzaro. They existed before him, but he first gave to them poetic excellence. His principal poem, entitled *Phantasia Macaronia*, a burlesque mixture of Latin, Italian, Tuscan, and plebeian words and forms, satirically narrates the adventures of its hero until he finally arrives in hell. In his *Apologetica* to the work he describes the new species of poetry, deriving the name from macaroni, because, like that mélange of paste, butter, cheese, and spice, it should be coarse and popular. The oldest German macaronic poem is the *Floia, Cortum versicale de Flois swartibus, illis Deiriculis, que omnes fere Minschos, Mannos, Weibras, Jungfras, etc., behuppere et spitziibus suis schnapflis steckere et bittere solent, Autore Grifholdo Knicknackio ex Flolandia*, which since 1593 has been often reprinted. Another German macaronic is entitled *De Lusitate Studentica*. Molière gives examples of French macaronic verses in *Le malade imaginaire*; and Rabelais, who often mentions Merlin the cook (Coccaie), employed this style in French prose. It prevailed in England as early as the reign of Henry II., and specimens exist from Walter de Mapes to John Skelton. Many pieces of macaronic poetry have been published during the last few years both in England and the United States.—See "Macaronic Poetry," collected with an introduction by J. A. Morgan (New York, 1872).

**McARTHUR, Duncan**, an American pioneer, born in Dutchess co., N. Y., June 14, 1772, died in Ohio, April 28, 1839. His family removed in 1780 to the western frontier of Pennsylvania, and at 18 he left his father's house and participated as a ranger or scout in the warfare with the Indians in Kentucky and Ohio, until the victory of Gen. Wayne in 1794. He soon afterward settled in Ohio as a surveyor, acquired a large landed estate, became a member of the Ohio legislature, and was appointed major general of the territorial militia. In the war of 1812 he received the commission of brigadier general in the army, and after

-serving for two years as second in command succeeded Gen. Harrison in 1814 in command of the army of the West. In the latter part of this year he partly accomplished a bold plan of conquering Upper Canada, which he was obliged to relinquish from a failure of the forces of Gen. Izard to cooperate with him. After the peace, as a joint commissioner with Gen. Cass, he negotiated the treaty with the Indians of Ohio for the sale of their lands in that state, which was ratified in 1818. He subsequently served again in the Ohio legislature, and in 1823-'5 was a representative in congress; and he was governor of the state from 1830 to 1833.

**MACARTNEY, George**, earl, a British diplomatist, born at Lissanoure, near Belfast, May 14, 1737, died in Ohiswick, England, March 31, 1806. He graduated at Trinity college, Dublin, studied law in London, and in 1765 was sent as envoy extraordinary to the court of Russia, with which country he succeeded in concluding a commercial treaty. In 1769 he was made chief secretary for Ireland, and distinguished himself in the Irish parliament, to which he had been returned, by his contests with the former lords justices, who for selfish purposes had joined the patriot party. He was governor of the island of Grenada from 1775 to 1779, when, being compelled to surrender that possession to the French, he was sent prisoner to France. He was allowed by Louis XVI. to return to England, and was soon after exchanged. He was appointed governor of Madras in 1780; but ill health constrained him to resign this office in 1786, and to decline that of governor general of India to which he had been nominated before his arrival in London. In 1792 he was appointed ambassador extraordinary to the court of Peking, being the first English envoy ever sent to China. He was next made first British governor of the Cape of Good Hope, but declining health soon obliged him to return to England. In 1776 he was created baron, in 1792 viscount, and in 1794 Earl Macartney in the Irish peerage; and in 1796 he received a British barony. An account of his Chinese embassy by Sir George Staunton, who accompanied him as secretary, appeared in London in 1797 (2 vols. 4to). His life, with selections from his writings by Sir John Barrow, was published in London in 1807 (2 vols. 4to).

**MACASSAR**, or **Mangkassar** (also called by the Dutch **VLAARDINGEN**). I. A Dutch government, comprising the S. W. portions of the island of Celebes, in the Malay archipelago; area (as claimed by the Dutch authorities), 45,689 sq. m.; pop. in 1871, 345,912. (See **CELEBES**.) The name Macassar or Mangassa is properly that of a people inhabiting the S. part of the island, and having a language of their own with a written character. They are comparatively civilized, and soon after the first visit of the Portuguese in 1525 became the dominant people of Celebes. They embraced

Mohammedanism, which they forced upon the Bughis, the other principal race of the island. In 1669 they were subdued by the Dutch, who had recently driven out the Portuguese. The Dutch were themselves expelled by the British in 1811, but Macassar was restored to them with their other possessions in 1816. II. A town of the government, near the S. W. extremity of the island; pop. about 12,000. It is situated about 800 ft. from the beach, in a beautiful plain bounded inland by a range of mountains. It has a pier, at the end of which there is 15 or 16 ft. of water. The streets are wide, regular, and well built, most of the houses being of European construction. One street is set apart for the Chinese. The town is defended by Fort Rotterdam, a work of considerable strength, and surrounded by palisades, with gates which are closed at night. The climate is healthy, and storms are seldom experienced. Besides fisheries of tripong on the N. coast of Australia, and a large native traffic with almost every commercial place in the neighboring waters, Macassar has imports of piece goods, firearms, ammunition, cutlery, and woollens from the Netherlands, and nankeens, silks, sugar, tea, porcelain, &c., from China. It exports rice, cloves, nutmegs, sago, cotton wool, tortoise shell, and wax. It was made a free port by the Dutch in 1846.

**MACASSAR, Strait of**, a channel connecting the Celebes and Java seas, and separating the island of Celebes from that of Borneo. It is about 400 m. long, and from 75 to 240 m. wide, and runs N. and S. During the N. winds of January and February a strong current runs through it toward the south. Its navigation is obstructed by shoals and rocks.

**MACAUO**. See **LEMUR**.

**MACAULAY, Catharine** (**SAWBRIDGE**), an English authoress, born in Kent in 1733, died at Binfield, Berks, June 22, 1791. In 1760 she was married to Dr. George Macaulay, a London physician. He died soon after, and in 1778 she was married to Mr. Graham. She was an ardent republican, and a great admirer of Washington, with whom she corresponded, and whom she visited in 1785. Her principal works are: "History of England, from the Accession of James I. to that of the Brunswick Line" (8 vols. 4to, London, 1763-'83); "Reply to Mr. Burke's Pamphlet entitled 'Thoughts on the Causes of the Present Discontents'" (London, 1770); "A Modest Plea for the Property of Copyright" (London, 1774); "Address to the People of England, Scotland, and Ireland on the Present Important Crisis of Affairs" (Bath, 1775); "History of England, from the Revolution to the present Time" (2d ed., 4to, London, 1778); "Treatise on the Immutability of Moral Truth" (1783); and "Observations on the Reflections of E. Burke on the Revolution in France" (1790).

**MACAULAY, Thomas Babington**, baron, an English historian, born at Rothley Temple, in the village of Rothley, Leicestershire, Oct. 25, 1800,

died in Kensington, London, Dec. 28, 1859. His paternal ancestors were Scotch highlanders, and ministers of the kirk. He was the son of Zachary Macaulay, a West India merchant, renowned as a philanthropist and as one of the leaders of "the Clapham sect," and was born at the residence of his aunt, from whose husband, Thomas Babington, he was named. He studied under a Mr. Preston at Shelford, and at 18 was entered at Trinity college, Cambridge. His university career was brilliant. He gained the "chancellor's medal" in 1819 for a poem on "Pompeii," the same prize in 1820 for a poem on "Evening," and the second Craven scholarship in 1821. He was a leading member of the debating society. He took his bachelor's degree in 1822, and though he did not compete for honors, owing to his distaste for mathematics, he was chosen a fellow of his college. He resided in London and Cambridge alternately during the next four years, taking his master's degree in 1825; and he was called to the bar at Lincoln's Inn in 1826. During these four years he wrote several of his ballads, "The Spanish Armada," "Moncontour," "Ivry," and others, and also the earliest of his essays and critiques. These writings appeared principally in Knight's "Quarterly Magazine." His first contribution to the "Edinburgh Review" appeared in 1825, the subject being slavery, and his connection with that periodical lasted for 20 years. At that time he wrote poetical political "squibs" for the "Times," which were attributed to Moore. His first official appointment was that of commissioner of bankrupts, which was obtained for him in the interval between the fall of the Liverpool ministry and the formation of the Wellington ministry. His first public speech was made in 1826, at the annual anti-slavery meeting in London, and its brilliancy confirmed the reputation he had acquired in the debating societies of Cambridge and the metropolis. Much was expected of him by the whig party, to which he belonged; and in 1830 he was brought into parliament by one of the chiefs of that party, the marquis of Lansdowne, for the borough of Calne. His first speech in the house of commons was made April 5, 1830, in support of the bill to repeal the civil disabilities of the Jews of Great Britain; and his second, Dec. 13, on slavery in the West Indies. During the great debates that marked the course of the reform contest in the commons, Mr. Macaulay took a part second only to that of Mr. E. Stanley (afterward earl of Derby) in support of liberal principles. Mr. Croker was appointed by the tories to encounter the rising whig, but was worsted in the conflict. He made eight speeches on reform in the old parliament; and when the elections for the first reformed parliament took place, in 1832, he was returned for the town of Leeds. He spoke several times in 1833, his principal effort being on the East India company's charter bill, July 10, which the experienced speaker (Manners Sut-

ton) pronounced the best speech he ever heard. He was appointed secretary of the board of control in 1833; but he resigned that office, as well as his seat in parliament, in 1834, to go out to India as a member of the supreme council. He was appointed legal adviser to that body; and as the special object of his mission was to prepare a new Indian code, he was exempted from all share in the administration of affairs. He had four assistants, but the code produced was mostly his work. It contained 26 chapters, divided into nearly 500 clauses, and was published in 1838. One of his objects was to do justice to the native populations. The right of appealing from the local courts to the supreme court at the presidency had been enjoyed only by the English; but the new code provided that both natives and Europeans should have the right of appeal, but only to the highest provincial courts. This benevolent attempt drew down upon the codifier the denunciations of the English in India, who called this item of the code "the black act." The code proved a failure, and could not be applied to affairs of real life, because, the author's friends asserted, it was too good. In 1838 Macaulay returned to England; and in 1839 he was elected to parliament from Edinburgh, and was appointed secretary at war in the Melbourne ministry, with a seat in the cabinet. His first speech on resuming parliamentary life was made June 18, and was in support of the ballot. He spoke on all the leading questions that were discussed during the last two years of the Melbourne ministry; and when that ministry fell, in August, 1841, he went into opposition. Among other speeches which he then made were two of peculiar interest to Americans, one being on the treaty of Washington, and the other on the "apprehension of offenders bill," both in 1843. On the return of the whigs to power in 1846 he was made paymaster general. For his support of the Maynooth grant he incurred the animosity of his constituents, and failed of a reelection at Edinburgh in 1847. In 1840 a collection of his contributions to the "Edinburgh Review" was published at Boston, under the title of "Miscellanies," in 2 vols. 12mo, but omitting several of his best essays. This publication first made him generally known to the reading world. As the fruit of his residence in India, he wrote his articles on "Clive" and "Warren Hastings" for the "Edinburgh Review" in 1840 and 1841. His "Lays of Ancient Rome" were published in 1842, and, in addition to their merit as poetry, the introduction, explanations, and notes show a profound apprehension of the spirit of early Roman history. After the loss of his seat in parliament, he devoted himself to a work on English history, on which he had been some time employed. The first and second volumes of this work appeared at the close of 1848, bearing the title of "The History of England from the Accession of James the Second."

These volumes, besides introductory matter, contained the history of England from the accession of James II. to the settlement of the crown on William and Mary (1685-'9), a period of only four years; and as the author announced his purpose to bring the history down to a time which was within the memory of persons still living, a very extensive work was anticipated. The "History of England" was received with as much favor and enthusiasm as ever was bestowed upon the most popular of novels. The brilliancy of its style, the range of its authorities, and its liberal tone make it a favorite wherever a reading public exists. Some of the statements made by the historian led to controversy, as in the case of his charges against William Penn. (See PENN.) In 1849 he was chosen lord rector of the university of Glasgow, and made his installation speech March 21. The next day, on returning thanks for the tender of the freedom of the city of Glasgow, he spoke again, and took a formal farewell of political life, on which occasion he explained the principles which had governed his course as a statesman. "The path of duty," he said, "appeared to be between two dangerous extremes—extremes which I shall call equally dangerous, seeing that each of them inevitably conducts society to the other. I cannot accuse myself of having ever deviated far toward either." In 1852 he was elected to parliament by the people of Edinburgh without a movement on his part. He neither attended a meeting, nor issued an address, nor expended a farthing. The electors thus acted in order to repair voluntarily the wrong they had done him in 1847. He resumed his place in the house of commons, but the failure of his health did not admit of his participating in debate. His last speech was that which he made at Edinburgh in 1852, on the occasion of his reelection, and that was postponed for several months on account of his illness. At the close of 1855 the third and fourth volumes of his "History of England" were published. They carried the work down to the peace of Ryswick in the autumn of 1697, thus covering a period of less than nine years; and this was not complete, as the details of Scotch affairs for some time were postponed to the fifth volume. The welcome accorded to these volumes was as warm as that which had been bestowed on their predecessors, both in England and in America. His attacks on William Penn were continued in them, and those on Marlborough were much increased in force. His remarks on the Scotch highlands gave much offence in the country of his ancestors, and he was accused of dealing too favorably with the conduct of William III. in his narrative of the massacre of Glencoe. In 1857 he was chosen a foreign associate member of the French academy of moral and political sciences; and in the same year he was created a peer of England, with the title of Baron Macaulay of Rothley. He is supposed to have been somewhat puzzled for a territorial designation,

as his life had been passed in towns, and he did not belong to the landed aristocracy; and he took that of Rothley because he was born there, though with that place he had neither feudal nor territorial connection. His promotion was universally approved. It was supposed that the government wished to avail itself of his knowledge of Indian affairs, the full discussion of which was expected to take place, in consequence of the sepoy mutiny of 1857; but he never took any part in the debates of the peers. Continuing to pursue his historical labors, so far as the state of his health would permit, he died suddenly at his residence, Holly Lodge, Campden Hill, Kensington. The cause of his death was an affection of the heart, and its immediate occasion a fit of coughing. He was buried in Westminster abbey.—The edition of his "History" published in 1858 contained his last touches and corrections. A fifth volume, comprising all that he left ready for the press and extending to the end of the year 1701, was published by his sister, Lady Trevelyan, in 1861. It also contained a fragment giving an account of the death of King William. This, though it had not been revised, and was with great difficulty deciphered from the manuscript, is one of the most finished and beautiful passages of the whole work. His "Complete Works" have been edited by Lady Trevelyan (8 vols. 8vo, London, 1866; new ed., 1871). See also "Letters of Hannah More to Z. Macaulay, containing Notices of Lord Macaulay's Youth" (1860); his "Memoirs," by Dean Milman (1862); and his "Public Life," by F. Arnold (1862). A complete biography by Lady Trevelyan, and an edition of Macaulay's letters, are in preparation (1874).

**MACAW**, the common name of the large and gorgeous South American parrots of the subfamily *araine*, characterized by a large stout bill, compressed on the sides, with the culmen much arched to the prolonged and acute tip; the lower mandible is deeper than long, and broader at the base than the upper; the wings are long and pointed, with the second and third quills the longest; the tail lengthened, graduated, and each feather narrowed at the tip; tarsi short and robust, and covered with small scales; toes unequal, the anterior outer rather larger than the posterior outer. This subfamily embraces the genera *ara* (Brisson), *conurus* (Kuhl), and *enicognathus* (Gray), as given in the "Genera of Birds" by the last named author; but as the name macaw is generally given only to the first genus, this article will be restricted to the species of *ara*, with which the genus *macrocerus* (Vieill.) is synonymous. The macaws are remarkable for their size and the beauty of their plumage; they are confined to the tropical regions of America, where they inhabit the borders of forests, keeping almost entirely in the trees and rarely coming to the ground; they climb about in search of nuts and hard fruits and seeds, which they can readily break with their powerful bills; their food



is entirely vegetable, and the tongue is thick and soft; the flight is horizontal, and not elevated. Generally observed in pairs, they sometimes occur in small flocks, which utter the most piercing and disagreeable screams whenever disturbed; they are less docile than the true parrots, and can rarely be taught to articulate more than a few words in a discordant tone; they breed in hollow trees, laying generally two eggs, both sexes assisting in incubation; the cheeks are bare of feathers, having only a few minute plumes; the word *ara* is derived from the Indian name of the bird, and is an imitation of their ordinary cry. One of the handsomest species is the scarlet macaw (*A. macao*, Linn.), measuring 39 inches from the bill to the end of the tail; the principal color is bright red, with blue rump, vent, tail coverts, and quills, and greenish blue and yellow wing coverts; the tail, which is about two thirds of the whole length, is variegated with blue and crimson; the upper mandible is whitish, the lower one dusky, and the skin of the cheeks white and wrinkled. This magnificent bird is not uncommon in South America, and is occasionally seen in menageries. The red and blue macaw (*A. aracanga*, Gmel.) greatly resembles the last named species, but the middle of the wing coverts is bright yellow; it attains a length of 39 in., the tail measuring 24 in.; the prevailing color is vermilion red, the wings variegated with azure blue; the lower back, rump, and tail coverts are pale azure and ultramarine blue; the four longest central tail feathers vermilion red, the next on each side red and blue, and the rest wholly blue; the under surface of the tail deep red; iris yellow. It is widely distributed in intertropical South America, and even extends to Mexico; like



Blue and Yellow Macaw (*Ara ararauna*).

The blue and yellow macaw (*A. ararauna*, Linn.) is rather smaller and is less common than the two preceding; it is about 2½ ft. long, of a fine blue color above, with more or less tinge of green; the lower surface from the breast downward is a light orange yellow; the cheeks are white and the bill black. It frequents woods in marshy districts, where grow the species of palm upon whose fruit it principally feeds; when taken early, it is easily tamed, and may be taught to imitate certain sounds, though not to articulate distinctly; it is easily reconciled to captivity, and has been known to breed in confinement. The green macaw (*A. militaris*, Linn.) is of a general lively green color, with blackish brown bill, crimson forehead, reddish brown chin, blue lower back, upper tail coverts, wing coverts, and quills; the upper surface of the tail is scarlet with blue tip, the under surface and that of the wings orange yellow; the claws are strong, hooked, and black. It inhabits the warmer parts of the Andean chain, attaining an elevation of 3,000 ft., and is found also in Mexico; it attacks fields of corn and other grain in large flocks, often committing serious depredations; it also feeds upon fruits and fleshy seed vessels; it is docile and easily tamed. These birds were great favorites with the Inca Peruvians, who kept them as pets and ornamented their head dresses with their feathers.

**MACBETH**, a Scottish chieftain of the 11th century, and the hero of one of Shakespeare's tragedies, which invests him, however, with a character more legendary than historical. He seems to have been the vassal of Thorfinn, a Norwegian prince who had conquered the north of Scotland. King Duncan, in the absence of Thorfinn, invaded the latter's territories, which were defended by Macbeth, who defeated and killed Duncan in a battle near Elgin in 1039. Macbeth was then proclaimed king of Scotland. In 1054 he was defeated near Dunsinane by an English force under Siward, earl of Northumberland; and on Dec. 5, 1056 (or, as some have it, in April, 1057), he was defeated and killed at Lumphanan, by Macduff and Malcolm, the son of Duncan. Malcolm was proclaimed king.

**MACCABEES.** See **ASMONAENS**, and **HEBREWES**.

**MACCABEES, Books of**, the collective title of four works belonging to the Old Testament Apocrypha, and containing principally the details of the struggles of the Jews against the religious and civil tyranny of the Syrian kings in the heroic period of the Maccabees or Asmonaens. The books are connected only by their subjects, written by different authors, and of widely unequal literary merit. The first two in order are declared canonical by the councils of Florence and Trent, and are also contained in the original translation of Luther. The first book of Maccabees contains a narration of the persecution of the Jews under Antiochus Epiphanes, their revolt under MATHATHIAS and his sons, the death of that old

other macaws, it breeds twice a year; from its size and beauty it forms a striking feature in collections, but its harsh notes render it a disagreeable companion in a private house.

priest, the victories and death of his son Judas Maccabæus, and the wars and death by assassination of the two brothers and successors of the latter, Jonathan and Simon, concluding with the succession of Simon's son John Hyrcanus. It embraces a period of about 40 years (175-135 B. C.), but the history of the first seven years is very briefly given. In regard to the time treated this is the last of the four books. Its narration is lucid and brief, and there is little doubt that it was originally written in Hebrew. The author is unknown, but he is supposed to have lived in Egypt, and to have belonged to the Pharisees. According to Bertholdt, De Wette, and Ewald, he wrote his work shortly after the death of John Hyrcanus (106). The Greek text of the Septuagint version is the original of all others extant. Jerome says that he saw the original Hebrew. The book is highly valued by the fathers of the church, as well as by Jewish and Christian historians.—The second book is superior to the former in the purity and elegance of its language, which is believed to have been originally Greek. It professes to be an abridgment of an earlier historical work by a Jewish writer of Cyrene named Jason, relates the principal events of Jewish history in the reigns of Seleucus IV., Antiochus Epiphanes, and Antiochus Eupator, a period of 15 years, partly covered by the contents of the first book, and contains besides some letters which are held by many critics to be spurious. The historical epitome, which commences with the attempt of a Syrian general, Heliodorus, to rob the treasury at Jerusalem, and closes with the death of another, Nicanor, contains some valuable additions to other extant authorities on that period. This book is the second also in order of time. The precise age of both the author and his predecessor Jason is unknown; both probably lived between 150 and 70 B. C. Luther in his preface to the translation is severe in his judgment on this book, while he regards the first as hardly inferior to the histories of the Protestant canonical Scriptures.—A still lower opinion is generally entertained by Protestant theologians, as well as critics, of the contents of the third book of Maccabees, the first in order of time, which gives an account of a sacrilegious attempt of Ptolemy Philopator, after his victory over Antiochus the Great at Raphia (217 B. C.), to enter the holy of holies in the temple of Jerusalem, which was baffled by a miracle, and of a subsequent equally abortive attempt of the same king to have his Jewish subjects crushed by elephants in the hippodrome of Alexandria. The author and his age are unknown, and the book is in no way entitled to rank among the histories of the Maccabæan struggle. It was written in Greek; and besides the Latin and other versions, there is also one in Syriac.—The fourth book, the third in order of time, contains an amplification of the history of the martyrdom of Eleazar and of the seven sons of Hannah, the so-

called Maccabees, whose deaths are also described in the second book. An ethical use is made of the history, as indicated in the second title, "The Supremacy of Reason." It was attributed to Josephus by Eusebius, Jerome, and others, an opinion which is now generally regarded as unfounded.—Besides these four books, there is a fifth extant in Arabic and Syriac, by an unknown author, translated probably from Hebrew, which, like the second book, commences with the attempt of Heliodorus, but brings the history of the house of the Asmoneans down to its extermination by Herod the Great. The translators seem to have lived after the destruction of the temple of Jerusalem by Titus. Only the first two books of Maccabees are printed in the Apocrypha of the authorized English version. All are contained in Cotton's "Five Books of Maccabees in English" (Oxford, 1832).—See Grimm, *Das erste Buch der Maccabäer* (Leipzig, 1853), and *Das zweite, dritte und vierte Buch der Maccabäer* (1857); Ewald, *Geschichte des Volkes Israel*, vol. iv.; Freudenthal, *Die Flavius Josephus beigelegte Schrift über die Herrschaft der Vernunft* (Breslau, 1869); and Fritzsche, *Libri Apocryphi Veteris Testamenti Græce* (Leipzig, 1871).

**MCCARTHY, Justin**, an Irish author, born in Cork, Nov. 22, 1830. From 1846 to 1853 he was connected with the Cork "Examiner," and then joined the staff of the "Northern Times" at Liverpool. In 1860 he was a reporter in the house of commons for the London "Morning Star," of which he was subsequently foreign editor, and in 1864 chief editor. In 1868 he resigned that post, travelled extensively through the United States, resided for some time in New York, and returned to London in 1871. He has published "Paul Messie," a novel (anonymously, 1866; new ed., 1874); "The Waterdale Neighbors" (1867); "Con Amore," a collection of critical essays (1868); "My Enemy's Daughter" (1869); "Lady Judith" (1871); "Prohibitory Legislation in the United States," an account of some studying of such legislation and its workings in Maine, Massachusetts, Michigan, Iowa, &c. (1872); "Modern Leaders," a series of articles on living celebrities, republished from the "Galaxy" (1872); "A Fair Saxon," a political novel (1873); and "Linley Rochford" (1874). He is now (1874) preparing a "History of English Radicalism and its Leaders since 1832."

**MCCHEYNE, Robert Murray**, a Scottish clergyman, born in Edinburgh, May 21, 1813, died in Dundee, March 25, 1843. He entered the Edinburgh university in 1827, where, besides the usual course, he studied modern languages, and became proficient in gymnastic exercises, music, and drawing. He began to study theology in 1831, and in 1835 was licensed to preach by the presbytery of Annan, beginning his labors in the parish of Larbert. In 1836 he was called to St. Peter's church, Dundee. His health failing, he went to Palestine with

three associates on a "mission of inquiry to the Jews." Upon his return he resumed his labors at St. Peter's till 1842, when his health again failed, and he undertook a preaching tour to the north of England. A collection of his works was published in 1847 (2 vols., New York), and several volumes of his remains, letters, and fragments have been since issued. His life has been written by the Rev. A. Bonar (new ed., 1853), and a "Memorial Volume," originally issued in 1845, had in 1874 reached a sale of more than 100,000 copies.

**MACCHI, Mauro**, an Italian author, born in Milan about 1815. He was professor of rhetoric, but the Austrian government removed him from that post in 1839. He was afterward secretary of a scientific association established by Ugo Foscolo; but Austrian persecutions drove him to Turin, where he joined Brofferio in a journalistic enterprise. He returned to Milan in 1848, and founded an association of workmen, before whom he gave gratuitous lectures, but was not permitted to continue them after the Austrian victory at Novara. In 1850 he was expelled from Genoa, where he had published a republican journal, but was allowed to reside there in 1851. He became editor-in-chief of *Il Diritto*, the most influential journal of Turin, and in 1861 represented Cremona in parliament, as an ultra liberal, but advocating an alliance with France. Among his more recent works is a "History of the Council of Ten."

**MACCHIAVELLI.** See MACHIAVELLI.

**MCLELLAN, George Brinton**, an American soldier and engineer; born in Philadelphia, Dec. 3, 1826. He studied at the university of Pennsylvania, and in 1842 entered the military academy at West Point, where he graduated second in his class in 1846, and was assigned to duty as brevet second lieutenant in the corps of engineers. He served with distinction during the Mexican war, and was successively brevetted as first lieutenant and captain. In 1851-'2 he was assistant engineer in the construction of Fort Delaware; in 1852-'3 chief engineer in the department of Texas, having in charge the surveys of the coasts of that state; in 1853-'4 engineer for the exploration and survey of the western division of the proposed Pacific railroad; and in 1854-'5 he was on special service in collecting railroad statistics for the war department. In 1855-'6, having been made captain of artillery, he was a member of the military commission to visit the seat of war in the Crimea. He resigned his commission June 16, 1857, to take the post of chief engineer of the Illinois Central railroad, of which he was chosen vice president in 1858; and in 1860 he became president of the St. Louis and Cincinnati railroad. At the opening of the civil war he was commissioned as major general of Ohio volunteers, and was placed in command of the department of the Ohio, comprising the states of Ohio, Indiana, Illinois, and the western portions of Pennsylvania and Virginia. He was made major general in the reg-

ular army May 14, 1861, and commanded in several engagements in western Virginia, which resulted in clearing that region of the confederate forces, for which he received on July 15 the thanks of congress. On July 22, the day after the federal defeat at Bull Run, he was summoned to Washington, and was placed in command of the division of the Potomac, and shortly after of the army of the Potomac. Upon the retirement of Gen. Scott (Nov. 1) he was appointed general-in-chief of the armies of the United States. He took the field in March, 1862, and having in the mean time been relieved of the command of all the forces except the army of the Potomac, he set out for the peninsula of Virginia, and laid siege to Yorktown, which was abandoned by the confederates as soon as his batteries were ready to open fire. The retreating confederates, under Gen. J. E. Johnston, made a stand at Williamsburg (May 5) long enough to enable their trains to get off, and fell back toward Richmond. McClellan, moving slowly, reached the Chickahominy about May 20, and opened the campaign against Richmond, which was brought to a virtual close by the battle of Malvern Hill (July 1), after which he fell back to Harrison's landing, where he entrenched himself. (See CHICKAHOMINY.) Gen. Halleck, having in the mean while been made general-in-chief, ordered McClellan (Aug. 24) to return with his whole army to Fortress Monroe and Yorktown. Gen. Lee, almost simultaneously, moved from Richmond to threaten Gen. Pope, who had been placed in command of the Union forces in northern Virginia. The result was the defeat of Pope at Bull Run, Aug. 29, 30. Pope, at his own request, was relieved from the command of the forces at and about Washington, which was conferred upon McClellan. The confederates then undertook the invasion of Maryland, which was brought to a close by the battle of Antietam, Sept. 16, 17. (See ANTIETAM.) They then crossed the Potomac and fell leisurely back toward the Rapidan. Great dissatisfaction was felt at the slowness with which McClellan followed them, and on Nov. 7, when he appeared to be making preparations for an attack in force, he was superseded in command by Gen. Burnside. McClellan was directed to proceed to Trenton, N. J., there to await further orders, and took no further part in the war. The democratic national convention, held at Chicago, Aug. 29, 1864, nominated him for the presidency. He received only the 21 electoral votes of the states of Delaware, Kentucky, and New Jersey, the remaining 212 electoral votes admitted being cast for Abraham Lincoln. Of the popular vote 2,213,665 (a little more than 55 per cent.) were cast for Lincoln, and 1,802,237 (a little less than 45 per cent.) for McClellan. The latter resigned his commission in the army on the day of the election, Nov. 8, 1864, took up his residence in New York, and afterward went to Europe. In 1868 he returned from Europe and took

up his residence near Orange, N. J., and engaged in practice as an engineer. By the will of Mr. Edwin A. Stevens he was placed in charge of the Stevens floating battery which had for a number of years been in course of construction at Hoboken. He was also made superintendent of the construction of the railway bridge over the Hudson river, near Poughkeepsie, N. Y., and superintendent of docks and piers in the city of New York, but resigned the latter office in 1873. He has translated from the French "A Manual of Bayonet Exercises," adapted for the use of the United States army (1852), and written a volume of the government reports of the "Pacific Railroad Surveys" (1854), a volume of the reports of the European commission, "The Armies of Europe," &c., printed by order of congress (1861), and "Report on the Organization and Campaigns of the Army of the Potomac" (1864).

**MACCLESFIELD**, a market town and municipal and parliamentary borough of Cheshire, England, 147 m. N. W. of London; pop. in 1871, 35,451. It is pleasantly situated on the river Bollin, and on a declivity near Macclesfield forest. It has a fine church founded in 1278, and a heavily endowed grammar school dating from 1502. The staple manufacture is silk, which gives employment to about 70 mills. The cotton manufacture is also important. A canal which unites the Grand Trunk and the Peak Forest canals passes near Macclesfield, and opens water communication with most parts of England.

**McCLINTOCK, Sir Francis Leopold**, a British naval officer and arctic explorer, born in Dundalk, Ireland, in 1819. He entered the navy at the age of 12, and passed his examination in 1838; and after having been stationed for some time at Portsmouth as mate on the Excellent gunnery ship, he sailed to South America in H. M. steamer Gorgon. For his distinguished conduct in recovering this vessel when stranded near Montevideo he was promoted to a lieutenancy in 1845. During the next two years he was with the Pacific squadron, in the Frolic, Capt. Hamilton. Returning to England about the time when anxiety began to be expressed for the safety of Sir John Franklin, he entered heartily into the schemes for his relief, and accompanied Sir James Ross in one of the three arctic expeditions sent out by the admiralty in the spring of 1848. He reached home again in November, 1849, after an absence of 19 months, and early in the following year joined another expedition under Capt. Austin as first lieutenant of the Assistance, Capt. Ommaney. It was his fortune, in August, 1850, to see at Cape Riley the first traces of the missing mariners. In April, 1851, while the ships were fast in the ice in Crozier channel, he commenced a sledge journey of 80 days along the N. shore of Parry sound, travelling 760 m., and reaching the most westerly point which has yet been attained from the east in the arctic regions. The comparative perfection to which sledge travelling

has been carried is due in great part to the improvements which he effected. The squadron returned to England in the autumn of the same year, and Lieut. McClintock was at once promoted to the rank of commander. The following spring saw him in command of the Intrepid, one of the five vessels sent out to the polar regions under Sir Edward Belcher. In accordance with instructions from the admiralty, he sailed, in company with Capt. Kellett, toward Melville island in search of McClure, whom he rescued from a three years' imprisonment in the ice; but he was subsequently compelled to abandon his own ship with three others of Belcher's fleet, the whole expedition reaching home in September, 1854, some in their single remaining vessel and the rest with Capt. Inglefield. McClintock's services were recognized by his promotion to the rank of captain, but he did not obtain active employment until Lady Franklin offered him in 1857 the command of the highly successful expedition which is fully described in the article ARCTIC DISCOVERY (vol. i., p. 677), and which resulted in solving the mystery of Sir John Franklin's fate. On his return in 1859 from this important voyage, Capt. McClintock was received with great distinction. The university of Dublin conferred upon him the degree of LL.D., the corporation of London voted him the freedom of the city, the queen granted him the full pay of captain in the navy for the two years he was absent, and Lady Franklin presented to him the vessel in which he had made his memorable voyage. He was knighted Feb. 23, 1860, and in the spring of the same year was appointed by the government to survey a deep-sea route for a proposed North Atlantic telegraph. He was made a rear admiral in the fleet in October, 1871.

**McCLINTOCK, John**, an American clergyman, born in Philadelphia, Oct. 27, 1814, died at Madison, N. J., March 4, 1870. He graduated at the university of Pennsylvania in 1835, and entered the itinerant ministry of the Methodist Episcopal church. In 1836 he was appointed professor of mathematics in Dickinson college, and in 1839 of ancient languages. While holding this post he translated, in conjunction with Dr. Blumenthal, Neander's "Life of Christ," and with Prof. Crooks prepared a series of text books for Latin and Greek. From 1848 to 1856 he was editor of the "Methodist Quarterly Review," which under his charge gained a high place in various branches of literature. In 1856 he was appointed, in conjunction with Bishop Simpson, a visitor to the English, Irish, French, and German conferences, and was also a delegate at the meeting of the evangelical alliance held in Berlin. In 1857 he was placed in pastoral charge of St. Paul's (Methodist Episcopal) church in New York, and in 1860 was called to be preacher in the American chapel in Paris, France, under the charge of the American and foreign Christian union. While in Europe he devoted himself

largely to the advocacy of the Union cause in the civil war. His replies to articles in the London "Times," and his speeches in Exeter hall, produced great effect. On the continent he was greatly aided by the coöperation of Count de Gasparin, and his home in Paris became a centre for American Unionists abroad. In 1864 he returned to America, and was again placed in charge of St. Paul's church in New York; but impaired health compelled him to resign in 1865, and he took up his residence in Germantown, Pa. In 1866 he removed to New Brunswick, N. J., where for a time he filled the pulpit of St. James's church. During this year he was also chairman of the central centenary committee, organized to devise means for a fitting commemoration of the hundredth anniversary of American Methodism. Through his influence Mr. Daniel Drew, a member of St. Paul's church in New York, was induced to contribute a large sum as an offering to the centenary fund. This was appropriated to found an institution to be called the "Drew Theological Seminary" at Madison, N. J. (see MADISON), of which Dr. McClintock was president until his death. Several prominent positions were at different times offered to him; among these was the presidency of Troy university, for which his name was used in 1857-'8, but without any service as such on his part. The degree of D. D. was conferred upon him by the university of Pennsylvania in 1848, and that of LL. D. by Rutgers college in 1866. For many years he was an acknowledged leader in his denomination. As a pulpit orator no one surpassed him, and he has been designated as "probably the most complete scholar that his church has produced in the United States." His works, besides those already mentioned and numerous contributions to periodicals, include "Analysis of Watson's Theological Institutes" (1860), "Sketches of Eminent Methodist Ministers" (1852), "The Temporal Power of the Pope" (1853), and a translation of Bungener's "History of the Council of Trent" (1855). But his chief literary work, to which a great part of the last 20 years of his life was devoted, and which he did not live to complete, is the "Cyclopædia of Biblical, Theological, and Ecclesiastical Literature," projected by him and Dr. James Strong, the former having charge of the department of theological and ecclesiastical literature, and the latter of that of Biblical literature. The work was commenced in 1853, but the first volume did not appear till 1867, and the fourth was partially prepared at the time of Dr. McClintock's death. (See STRONG, JAMES.) Since then have been published a volume of his sermons, "Living Words" (1870), and "Lectures on Theological Encyclopædia and Methodology," a portion of a work which he had in preparation. Several other of his incomplete manuscripts are now (1874) in course of preparation for publication.

**McCLOSKEY, John**, an American archbishop, born in Brooklyn, N. Y., March 20, 1810. He

graduated at Mount St. Mary's college, Emmetsburg, Md., and studied theology in the seminary there. Having received priest's orders Jan. 9, 1834, he was sent to Rome, studied for two years in the Roman college, spent another year in France, and on his return was appointed assistant pastor of St. Joseph's church in New York, and six months afterward became rector of the parish. In 1841 Bishop Hughes nominated him first president of St. John's college, Fordham, but in 1842 he resumed the rectorship of St. Joseph's. At the solicitation of Bishop Hughes, he was appointed his coadjutor Nov. 21, 1843, with the title of bishop of Axiere, and was consecrated March 10, 1844. In the division of the diocese of New York which took place in 1847, Bishop McCloskey was nominated first bishop of Albany May 21. His zeal, eloquence, and popularity obtained him the means of building churches in every city and town, and of creating establishments for charity and education. He introduced into his diocese the ladies of the Sacred Heart, the sisters of charity, the sisters of mercy, the gray sisters hospitaliers from Montreal, the sisters of St. Joseph, and those of the third order of St. Francis; also the Jesuits, Oblates, Augustinians, Franciscans, and Capuchins. He began and completed the cathedral of Albany, devoting to it a large part of his own income. During his last years in that city he purchased extensive buildings in Troy, destined to be a general theological seminary for the dioceses forming the ecclesiastical province of New York, and obtained for it from the university of Louvain a staff of trained professors. After the death of Archbishop Hughes he was appointed to the see of New York, May 6, 1864, and took possession of it Aug. 21. Besides a large number of spacious churches built in the city and elsewhere, the archbishop has established a protrectory for destitute children at West Chester, in which upward of 1,100 boys and 500 girls are cared for and educated; a foundling asylum in 68th street, an asylum for female deaf mutes at Fordham, homes for destitute children and young girls attached to St. Stephen's and St. Ann's churches, homes for aged men and women, and new orphan asylums outside of New York city. To direct these institutions and to coöperate with the secular clergy, he has established communities of Dominicans, Franciscans, Capuchins, "Little Sisters of the Poor," and German Franciscan sisters for the German hospital. He has also labored strenuously to complete the new cathedral begun by his predecessor, for which he has given \$10,000 from his own private purse, and to procure materials for which he visited Rome in 1874.

**McCLURE, Sir Robert John Le Mesurier**, a British navigator, born in Wexford, Ireland, Jan. 28, 1807, died in London, Oct. 14, 1873. He was the son of an officer, and through the influence of Gen. Le Mesurier he was educated at Eton and Sandhurst. He served as midshipman



several years, and his zeal during his first arctic voyage under Capt. Back was rewarded by a lieutenancy. In 1848 he accompanied the Franklin expedition of Sir John Ross. In the years 1850-'54 he led the crew of her majesty's ship Investigator by vessel and sledge across the great ice-encumbered sea, from the Pacific to the Atlantic, *via* Banks land and Melville island, being finally delivered by McClintock and Kellett, of Belcher's expedition, and thus achieving what is known as a northwest passage. Lady Franklin, however, in a letter to the London "Times," Oct. 28, 1873, claims for Sir John Franklin the honor of having been the first to discover the northwest passage, during his last expedition. (See ARCTIC DISCOVERY.) McClure was made captain and a baronet, and parliament voted to him a sum of £5,000. Capt. (since Admiral) Sherard Osborn published from McClure's documents a narrative of "The Discovery of the Northwest Passage" (London, 1856).

**MCCOOK**, a S. E. county of Dakota, recently formed, and not included in the census of 1870; area, 432 sq. m. It is drained by Vermilion river. The surface consists of undulating prairies, and the soil is fertile.

**MCCOSH, James**, a Scottish metaphysician, born in Ayrshire in 1811. He was educated at the universities of Glasgow and Edinburgh; and while a student at Edinburgh he wrote an essay on the Stoic philosophy, for which the university, on motion of Sir William Hamilton, conferred upon him the honorary degree of A. M. He was ordained a minister of the church of Scotland at Arbroath in 1835, but removed in 1839 to Brechin, where in 1843 he took an active part in the organization of the Free church of Scotland. While pastor at Brechin he published a work entitled "Method of the Divine Government, Physical and Moral" (Svo, Edinburgh, 1850), in which he endeavors to interrogate nature by the inductive method, avoiding either a preconceived rational system or a transcendental intuitionism, inquiring what is the method of the divine government, primarily in the physical world, and secondarily in providence as related to the character of man and tending to his restoration. This work discusses the laws of substance and phenomenon and of cause and effect in physical nature and in the human mind, and gained the author a wide reputation both in Great Britain and in America. He has since continued the argument in "The Supernatural in relation to the Natural" (Belfast, 1862), which was intended as the first part of a work on "The Method of the Divine Government, Supernatural and Spiritual," and shows that nature, as distinguished from the supernatural, is really a system within the larger system of the supernatural, from which it springs. In 1851 he was appointed professor of logic and metaphysics in Queen's college, Belfast, where he became distinguished as a lecturer, and wrote

his "Intuitions of the Mind inductively investigated" (London, 1860), which established his reputation as a metaphysical writer. It explains what intuitions properly are, which of them are moral convictions, and how they are related to the sciences, particularly to metaphysics and theology. Avoiding alike the negation of Locke and an extravagant transcendentalism, he investigates the intuitions by a strict induction from facts well established by consciousness, using induction to discover what is prior to induction. In 1868 he removed to the United States, having been elected president of the college of New Jersey, at Princeton, where his administration has been remarkably successful. Since assuming this office he has published "The Laws of Discursive Thought," a text book of logic, discussing with great fulness the nature and relation of terms, which he makes the foundation of all reasoning, holding that logic has mainly to do with "the notion." He received the degree of LL. D. from Harvard university in 1868. Besides the works already named, he has published "An Examination of Mill's Philosophy" (London, 1866); "Philosophical Papers," containing a review of Sir William Hamilton's "Logic" (1869); "Christianity and Positivism," a course of lectures delivered in the Union theological seminary in New York (1871), in which he declares that the questions of evolution and the origin of life belong to science altogether, but, however decided, will not impair the theological argument from design; and "The Scottish Philosophy, Biographical, Expository, and Critical, from Hutcheson to Hamilton" (New York, 1874). In conjunction with Prof. George Dickie, M. D., he has published "Typical Forms and Special-Ends in Creation" (Edinburgh, 1856). He has also published a number of important addresses.

**McCRACKEN**, a W. county of Kentucky, separated from Illinois by the Ohio river; area, 232 sq. m.; pop. in 1870, 13,988, of whom 3,289 were colored. The Tennessee river forms its N. E. boundary, and it is drained by the Clark river and its branches. The surface is level and the soil fertile. The Paducah and Memphis railroad passes through it. The chief productions in 1870 were 31,543 bushels of wheat, 273,914 of Indian corn, 18,690 of Irish and 11,985 of sweet potatoes, 1,545,050 lbs. of tobacco, and 84,991 of butter. There were 1,359 horses, 887 mules and asses, 1,392 milch cows, 1,540 other cattle, 4,110 sheep, and 12,600 swine; 3 manufactories of agricultural implements, 5 of carriages and wagons, 4 of iron castings, &c., 4 of saddlery and harness, 1 of sash, doors, and blinds, 3 of tobacco and snuff, 3 of cigars, 3 saw mills, and 2 flour mills. Capital, Paducah.

**McCREA, Jane**, an American woman, born at Lamington, N. J., in 1754, killed near Fort Edward, Washington co., N. Y., July 27, 1777. She was the daughter of a Scotch Presbyterian clergyman settled in New Jersey, after whose

death she went to live with a brother on the Hudson river in the neighborhood of Fort Edward. At the commencement of the revolution she was betrothed to a young man named David Jones, who, adhering to the crown, went to Canada and was commissioned a lieutenant in a loyalist regiment. The approach of Burgoyne's army from the north in the summer of 1777 having spread consternation through the neighboring country, Miss McCrea's brother, who was a whig, prepared to remove to a place of safety, and sent for his sister, then on a visit to a Mrs. McNeil, residing at Fort Edward. Miss McCrea, supposing that her lover was in the invading army, lingered day after day at Mrs. McNeil's, with the hope of an interview with him. The summons of her brother having at last become peremptory, she prepared reluctantly to embark in a bateau which was to convey several families down the Hudson out of reach of danger. On the morning fixed upon for her departure the house was suddenly surprised by a party of hostile Indians belonging to Burgoyne's army, and sent out by him to scour the country and harass the Americans; Mrs. McNeil and herself were made prisoners, and with other members of the family were hurried off to Burgoyne's camp. Mrs. McNeil arrived there in safety, and half an hour afterward another party of Indians came in with freshly severed scalps, on one of which she recognized the long glossy hair of Jane McCrea. The precise manner of her death has never been ascertained. The Indians said that she was killed by a random shot from a detachment of Americans sent out in pursuit, and that, being thus cut off from the reward offered for prisoners, they secured her scalp and left her body by the wayside. Another story is that a quarrel arose among the Indians as to whose prize she was, in the midst of which one of them in a paroxysm of rage tomahawked her. The event caused a general feeling of horror through the country, and even in Europe, and Burke used the story with powerful effect in the British house of commons. An acrimonious correspondence ensued between Gates and Burgoyne; but the latter, who professed to be as much shocked as any one at the tragedy, denied peremptorily that the Indians were allowed to perpetrate such excesses with impunity. He immediately summoned a council of Indian chiefs, and demanded that the murderer should be given up; but it having been represented to him that his Indian allies would in that event probably desert him, he was persuaded to let the offender go unpunished. The story has been related in various ways, and under the hands of successive narrators has been expanded into a pathetic love romance. It was said that Lieut. Jones hired the Indians to bring his mistress to the camp, and that they murdered her on the way to settle a dispute respecting the reward offered. This, however, he always denied. He retired to Canada soon after, and lived to be

an old man, but was to the close of his life melancholy and taciturn. Jane McCrea was buried on a hill near Fort Edward, and was afterward disinterred and buried near Threemile creek. A few years later the remains were removed to the old Fort Edward burying ground, at which time, it is said, her skull was examined and exhibited no mark of a cut or gash from a tomahawk. In 1874 the remains were removed to the new Union cemetery, between Fort Edward and Sandy Hill, and a marble slab was placed over the grave by Miss McCrea's niece, Mrs. Sarah H. Payn.

**McCRIE, Thomas**, a Scottish author, born at Duns in November, 1772, died in Edinburgh, Aug. 5, 1835. He was educated at the university of Edinburgh, and in 1795 was licensed as a preacher by the Antiburgher Associate presbytery of Kelso. For his active opposition to the voluntary principle in ecclesiastical polity, he was deposed in 1806. Afterward he was prominent in the Constitutional Associate presbytery. He wrote a "Life of John Knox" (1812; enlarged ed., 1831), and a "Life of Andrew Melville" (1819), giving an account of the formation of the Scottish kirk. In 1827 appeared his "History of the Progress and Suppression of the Reformation in Italy;" and in 1829 "The Progress and Suppression of the Reformation in Spain in the Sixteenth Century." He also reviewed Scott's "Old Mortality," to defend the Covenanters. He opposed Catholic emancipation in 1829, and subsequently took part in the "anti-patronage" controversy. He left an unfinished "Life of Calvin." His son edited a uniform edition of his works (4 vols., Edinburgh, 1855-'7).

**McCULLOCH**, a W. county of Texas, bounded N. by the Colorado river; area, 915 sq. m.; pop. in 1870, 173. The land along the Colorado is susceptible of good cultivation.

**McCULLOCH, John**, a British physicist, born in the island of Guernsey, Oct. 6, 1773, died in Penzance, Cornwall, Aug. 21, 1835. He took the degree of M. D. at Edinburgh in 1791, entered the army as assistant surgeon, and in 1803 was appointed chemist to the board of ordnance. In 1807 he settled at Blackheath, and commenced practice as a physician, but in 1811 was engaged by government to make scientific surveys in Scotland. His most important publications are: "A Description of the Western Islands of Scotland" (2 vols., London, 1819); "A Geological Classification of Rocks" (1821); "The Highlands and Western Islands of Scotland" (4 vols., 1824); and "Proofs and Illustrations of the Attributes of God from the Facts and Laws of the Physical Universe" (3 vols., 1837).

**McCULLOCH, John Ramsay**, a Scottish economist, born at Whithorn in Wigtownshire, March 1, 1789, died at the stationery office, Westminster, Nov. 11, 1864. From 1828 to 1832 he was professor of political economy in the university of London. He afterward received from government for his services to lit-

erature a pension of £200, and the comptrolership of the stationery office. He published "Principles of Political Economy;" "Treatise on the Principles and Practical Influence of Taxation and the Funding System;" "Statistical Account of the British Empire;" "Dictionary, Practical, Theoretical, and Historical, of Commerce and Commercial Navigation;" and "Dictionary, Geographical, Statistical, and Historical, of the various Countries, Places, and principal Natural Objects in the World."

**MACDIARMID.** I. John, a Scottish author, born at Weem, Perthshire, in 1779, died in London, April 7, 1808. He was educated at the universities of Edinburgh and St. Andrews, and in 1801 established himself in London, where he commenced his literary career as editor of the "St. James's Chronicle." Upon the breaking out of the war with France in 1802, he examined into the system of national defence adopted, and in 1805 published an elaborate work entitled "An Inquiry into the System of Military Defence of Great Britain" (2 vols. 8vo), in which he undertook to show that a regular army in the event of an invasion is superior to volunteers. This work was followed by "An Inquiry into the Principles of Civil and Military Subordination" (1804). Although worn down by incessant devotion to literary labors, he entered with ardor upon a new plan of political biographies, and in 1807 produced his "Lives of British Statesmen" (4to), beginning with Sir Thomas More. He was prostrated by a paralytic stroke in November, 1807, and was carried off by a second attack.

**II. John,** a Scottish miscellaneous author, born in Edinburgh about 1789, died in Dumfries, Nov. 12, 1852. He was educated at the university of Edinburgh, and became a clerk in a bank, devoting his leisure hours to literary pursuits. He was a contributor to the "Scots' Magazine," and in 1817 editor of the "Dumfries Courier." The most important of his works are: "History of Dumfries;" "Life of Cowper;" "Life of William Nicholson, the Galloway Poet;" "Sketches from Nature;" and "The Scrap Book."

**McDONALD,** the S. W. county of Missouri, bounded S. by Arkansas and W. by the Indian territory; area, 475 sq. m.; pop. in 1870, 5,226, of whom 37 were colored. It is drained by various tributaries of the Neosho river. The surface is undulating and the soil fertile. The chief productions in 1870 were 34,160 bushels of wheat, 156,712 of Indian corn, 27,099 of oats, 9,736 of Irish and 6,159 of sweet potatoes, 10,466 lbs. of tobacco, 19,314 of butter, and 28 bales of cotton. There were 1,839 horses, 3,347 cattle, 3,851 sheep, and 13,067 swine. Capital, Pineville.

**MACDONALD, Étienne Jacques Joseph Alexandre,** duke of Taranto, a marshal of France, born at Sancerre, Nov. 17, 1765, died at his château near Guise, Sept. 24, 1840. He was descended from a Scottish family, which, following the fortunes of the Stuarts, emigrated to France. Entering

the army in 1784, he served in the campaigns of the Low Countries and the Rhine in 1792-'7, and for his participation in the passage of the Waal on the ice, under a heavy fire from the enemy, in 1795, was made a general of division. In 1798 he was appointed governor of the Papal States, and defeated a large Neapolitan army under Gen. Mack at Otricoli. The disasters sustained by the French generals in northern Italy in the beginning of 1799 having rendered the evacuation of Naples indispensable, Macdonald retreated toward Lucca; and being joined in June by several additional corps, he attacked the combined army of Austrians and Russians under Suvaroff on the banks of the Trebbia on the 17th of the month. After an obstinate contest of three days, in which each side suffered a loss of 12,000 men, Macdonald, learning that the allies were expecting large reinforcements, retired by a circuitous march to Genoa. Compelled by ill health to return to Paris, he rendered important assistance to Bonaparte on the 18th Brumaire, in return for which he was appointed to command the army of the Grisons. With this force in the winter of 1800-'1 he accomplished the celebrated passage of the Splügen, and was following up the enemy vigorously when the armistice of Treviso put an end to his movements. From 1802 to 1804 he was minister at the court of Denmark, but between the latter period and 1809 he held no command, Napoleon being incensed with him for participating in the defence of Gen. Moreau. In 1809, however, to fill the chasms which death had made in the ranks of the French generals, he was again intrusted with a command, and rendered efficient services to Eugène Beauharnais in Italy. Transferred to the seat of war in Germany, he took part in the battle of Wagram, and by his heroic attack on the Austrian centre, the most important achievement in his military career, gained his marshal's baton and his title. On the day after the battle Napoleon effected a complete reconciliation with the new marshal, whom he thenceforth learned to trust and esteem. In 1810-'11 Macdonald served in Spain, but added little to his reputation; in the Russian campaign of 1812 he successfully conducted an independent line of operations toward Riga; and in the campaign of 1813 he fought at Lützen and Bautzen, was badly beaten by Blücher on the Katzbach, Aug. 26, and at Leipsic performed prodigies of valor, escaping from the catastrophe which overwhelmed the rear guard of the French army after the destruction of the bridge over the Elster, by swimming the river on horseback. He steadily adhered to the waning fortunes of Napoleon in the campaign of 1814, and participated in the negotiations ending in the emperor's abdication with a fidelity and consideration which the latter duly acknowledged. Having given in his adherence to the Bourbons, he declined all offers of command from Napoleon during the hundred days. He received many distinctions from succeeding

sovereigns, but retired from public life during his latter years.

**MACDONALD, Flora**, a Scottish heroine, born in the isle of South Uist, one of the Hebrides, in 1720, died March 4, 1790. She was the daughter of Macdonald of Milton, who belonged to the Macdonalds of Clanranald. Her father died when she was an infant, and her mother married Macdonald of Arnadale, in Skye, to which island Flora was removed. In June, 1746, she visited her stepbrother at Milton, in South Uist, and while there made the acquaintance of Capt. O'Neil, one of the companions of Charles Edward Stuart, then on his wanderings after his defeat at Culloden. O'Neil proposed that she should take Charles with her to Skye, disguised as a woman. Though a confirmed Jacobite, she at first positively declined; but an interview with the prince led to a change of mind, and she entered warmly into the scheme. Her stepfather, who commanded one of the militia parties in the service of the government, gave her a passport for herself, for a male attendant, for "Betty Bourke, a stout Irishwoman," and for three others. Flora, the prince, and one attendant sailed from Benbecula, June 28. They encountered serious dangers, but finally reached Skye, where they were assisted by Lady Macdonald, whose husband was then with the duke of Cumberland, commander of the royal forces. This lady consigned the prince and his attendant to the care of Macdonald of Kingsburgh, her husband's factor, who took them to his house, to which Flora also proceeded. Here the services of Flora to the prince ended, during all of which she had exhibited the utmost coolness and courage, without which the unfortunate adventurer must have fallen into the hands of his enemies. A price, £30,000, was on his head. The next day the prince bade farewell to Flora, at Portree, in Skye. The part she had taken in this romantic affair soon became known, and she was arrested, and, after five months' detention on board vessels of war, was sent to London, where she suffered a mild imprisonment. She was discharged under the act of indemnity in 1747, not a question having been asked of her. Placed in the family of Lady Primrose, a Jacobite, she was an object of much interest to society. Returning to Scotland, in 1750 she married Macdonald the younger of Kingsburgh. The family emigrated to North Carolina about 1775, and settled in Fayetteville; but siding with the loyalists, they experienced adventures, and met with losses. Flora embarked alone for Europe, and actually took part in an engagement which the vessel she was in fought with a French vessel, and had her arm broken by a fall. Some time after her return to Scotland she was joined by her husband. She was the mother of several children, and her four sons entered the British service. On her death her body was wrapped in one of the sheets of the bed in which Charles Edward slept on the night he passed at Kings-

burgh. This sheet Mrs. Macdonald had carried with her throughout all her wanderings.

**MacDONALD, George**, a British author, born in Huntly, Aberdeenshire, in 1824. His father, a descendant of the Macdonalds of Glencoe, was the proprietor of the Huntly mills. George graduated at the university of Aberdeen, studied theology in Owens college, Manchester, and for several years was a preacher of the Independent body in Surrey and Sussex. He finally left the pulpit, became a layman of the church of England, and for a time was principal of a young ladies' seminary in London. In 1857 he travelled on the continent, and visited Algiers. In 1872-'3 he made a lecturing tour in the United States. He has published: "Within and Without" (1855); "Poems" (1856); "Phantastes, a Faerie Romance" (1858); "David Elginbrod" (1863); "The Portent" (1864); "Alec Forbes of Howglen" (1865); "Adela Cathart" (1866); "Dealings with the Fairies" (1867); "The Disciples and other Poems" (1867); "Unspoken Sermons" (1867); "Annals of a Quiet Neighborhood" (1868); "The Seaboard Parish" (1868); "Robert Falconer" (1868); "Guild Court" (1868); "The Miracles" (1870); "England's Antiphon" (1870); "Ranald Bannerman's Boyhood" (1871); "At the Back of the North Wind" (1871); "The Princess and the Goblin" (1871); "The Vicar's Daughter" (1872); "Wilfrid Cumbermede" (1872); "Gutta Percha Willie" (1873); "Malcolm" (1874). He now resides in London and at Hastings.

**MACDONALD, James**, an American physician, born at White Plains, N. Y., July 18, 1803, died at Flushing, L. I., May 5, 1849. He took his degree of M. D. in 1825, and was appointed resident physician of Bloomingdale lunatic asylum. In 1831 he was sent by the governors of the New York hospital to visit the insane hospitals of Europe, stipulating that on his return he should have entire charge of the asylum for five years. In 1837 he resigned, and for the next four years he was a visiting physician of the New York hospital. In 1841 he opened a private insane asylum at Murray Hill, afterward removed to Flushing. In 1842 he began at the college of physicians and surgeons a course of lectures on mental diseases. His published works include "An Essay on the Construction and Management of Insane Hospitals," "A Review of Ferrers on Insanity," "A Dissertation on Puerperal Insanity," and several reports. He was a frequent contributor to the "American Journal of Insanity."

**McDONOUGH**, a W. county of Illinois, watered by Crooked creek and its branches; area, 576 sq. m.; pop. in 1870, 26,509. The surface is mostly prairie, and the soil productive. The Chicago, Burlington, and Quincy, and the Toledo, Peoria, and Warsaw railroads pass through it. The chief productions in 1870 were 310,017 bushels of wheat, 52,401 of rye, 1,362,490 of Indian corn, 280,717 of oats, 71,476 of potatoes, 53,316 lbs. of wool, 413,416

of butter, and 27,404 tons of hay. There were 11,402 horses, 20,866 cattle, 14,751 sheep, and 41,091 swine; 5 manufactories of carriages, 5 of saddlery and harness, 6 flour mills, and 3 saw mills. Capital, Macomb.

**McDONOUGH, Thomas**, an American naval officer, born in New Castle co., Del., Dec. 23, 1783, died at sea, Nov. 16, 1825. He entered the navy as a midshipman in February, 1800, and in 1803 was attached to the frigate Philadelphia, Capt. William Bainbridge, one of the squadron employed against Tripoli, under the command of Com. Edward Preble. On Aug. 26, 1803, the Philadelphia captured off Cape de Gatte, on the coast of Spain, the Moorish frigate Meshboa, and McDonough escaped the captivity which subsequently befell the officers and crew of the Philadelphia by being left at Gibraltar with her prize. He afterward served in the schooner Enterprise, commanded by Decatur, participating in the various attacks made in 1804 upon the city and batteries of Tripoli, and was one of the party under Decatur which recaptured and destroyed the Philadelphia on the night of Feb. 16, 1804. In 1807 he was promoted to the rank of lieutenant, and in 1813 to that of master commandant. In 1814 he commanded a squadron on Lake Champlain, and on Sept. 11 of that year gained a victory over a British squadron commanded by Commodore George Downie. (See CHAMPLAIN, LAKE.) For his services on this occasion McDonough was made captain, and received a gold medal from congress. Numerous civic honors were also bestowed upon him by different cities and towns, and the legislature of Vermont presented him with an estate upon Cumberland Head, which overlooks the scene of the engagement. His last command was that of the Mediterranean squadron, and he died on board a trading brig sent by government to bring him home.

**McDUGALL, Alexander**, an American soldier, born in Scotland in 1731, died in New York, June 8, 1786. His father emigrated to New York about 1755, and followed the occupation of a milkman, in which he was assisted by his son. Subsequently the latter became a printer, and in 1770 was imprisoned for a libel on the colonial government. At the outbreak of the revolution, being known as a zealous and active whig, he joined the army, and rapidly rose to the rank of major general. He commanded in the action near White Plains (1776), and also participated in the battle of Germantown (1777). In 1781 he was elected a delegate to the continental congress.

**McDOWELL, I.** The S. county of West Virginia, bordering on Virginia, and drained by the Tug fork of Sandy river; area, about 900 sq. m.; pop. in 1870, 1,952. The S. and E. parts are mountainous. The chief productions in 1870 were 31,586 bushels of Indian corn, 3,615 of oats, 2,310 of Irish and 1,049 of sweet potatoes, 3,000 lbs. of tobacco, 2,404 of wool, and 15,597 of butter. There were 189 horses,

1,251 cattle, 1,300 sheep, and 1,981 swine. Capital, Peerysville. **II.** A W. county of North Carolina; area, 550 sq. m.; pop. in 1870, 7,592, of whom 1,772 were colored. The Black mountains are on its W. boundary, some of the summits of which are over 6,000 ft. high. The Catawba rises in these mountains. In the valleys the soil is generally fertile. The chief productions in 1870 were 11,955 bushels of wheat, 8,411 of rye, 176,364 of Indian corn, 11,580 of oats, 5,394 of Irish and 4,135 of sweet potatoes, 8,866 lbs. of wool, and 18,254 of butter. There were 618 horses, 500 mules and asses, 1,348 milch cows, 2,092 other cattle, 3,054 sheep, and 6,552 swine. Capital, Marion.

**McDOWELL, Irvin**, an American soldier, born in Franklin co., Ohio, Oct. 15, 1818. He attended for some time a military school in France, graduated at West Point in 1838, and from 1841 to 1845 was employed there in various capacities. In the Mexican war he was brevetted captain for his conduct at the battle of Buena Vista, and was subsequently adjutant general in Wool's division of the army of occupation. From 1848 to 1858 he was assistant adjutant general in various departments, and resumed his duties after a year's leave of absence in Europe. At the opening of the civil war he was stationed at Washington, engaged in organizing the troops there. He was appointed brigadier general of the United States army, May 14, 1861, and was placed in command of the department of N. E. Virginia, and on May 27 of the army of the Potomac. He commanded at the battle of Bull Run, July 21, and subsequently had charge of the defences of Washington until March 14, 1862, when he was made major general of volunteers, and placed in command of a corps of the army of the Potomac. He was engaged in the operations in northern Virginia, took part in the pursuit of Gen. Jackson, and under Pope was present at the second battle of Bull Run, Aug. 29, 30, 1862. In 1863-'4 he was president of the court for investigating cotton frauds and of the board for retiring disabled officers. From July, 1864, to June, 1865, he was in command of the department of the Pacific, and in the latter year was brevetted major general of the United States army. He was mustered out of the volunteer service Sept. 1, 1866, and has since commanded the departments of the East and of the South.

**McDOWELL, Patrick**, a British sculptor, born in Belfast, Ireland, Aug. 12, 1799, died Dec. 9, 1870. In his youth he was apprenticed to a coachmaker in London, who died when McDowell was about 18 years old. He was then admitted to the studio of a French sculptor named Chenu, where he soon developed a taste for modelling. A design for a public monument to Major Cartwright, the advocate of parliamentary reform, first brought him into notice; but a figure of "A Girl Reading," of which he executed a duplicate for the earl of Ellesmere, decided his reputation. He became



a royal academician in 1846. Among his chief works are: "Love Triumphant," a group executed for Mr. William Beaumont, "A Girl at Prayer," "Cupid," "Early Sorrow," "Psyche," "The Death of Virginia," and "Eve."

**McDUFFIE**, an E. county of Georgia, formed since the census of 1870, bounded N. by Little river, a tributary of the Savannah; area, about 350 sq. m. The surface is rolling and timbered, and the soil productive. It is traversed by the Georgia railroad. Capital, Thomson.

**McDUFFIE, George**, an American statesman, born in Columbia co., Ga., about 1788, died in Sumter district, S. C., March 11, 1851. He began life as clerk in a mercantile establishment in Augusta, Ga., graduated at the South Carolina college in 1813, was admitted to the bar in 1814, and soon established himself in practice in Edgefield, S. C. In 1818 he was elected to the South Carolina legislature. A political controversy in which he was involved with Col. William Cummings of Georgia led to several duels, in one of which he was wounded with a ball, which, being never extracted, affected his health through life. His writings at this time were diametrically opposed to the views which he subsequently espoused, as he then maintained the principle of consolidation against that of state rights. His various papers on this subject were collected in a series of pamphlets, entitled "The Crisis." In 1821 he became a member of congress. In December, 1823, he introduced a motion for a select committee to inquire into the expediency of recommending to the states a change in the constitution, so as to establish uniformity in the mode of electing the members of the house of representatives, and also a change in respect to the mode of choosing electors for president and vice president. As chairman of this committee, he made an elaborate report. In January, 1825, he opposed internal improvements in the states by congress. In the 19th congress he argued against the proposed congress of Panama, a favorite measure of President Adams. He also brought up again the subject of amendments to the constitution as to the election of president and vice president, his main object being to prevent the choice from ever falling into the house of representatives. As chairman of the committee of ways and means, he endeavored to maintain the bank of the United States. He was a frequent assailant of the protective tariff, and was engaged in the debates on most of the important questions before the house. In December, 1830, he opened the case, in a speech of great power, for the prosecution in the trial of Judge Peck, on an impeachment for which the senate had been resolved into a court. Though he had been originally a supporter of President Jackson, yet as his administration had not satisfied the state rights men of the south, he became his adversary. In South Carolina the hostility to the protective tariff policy had reached its climax, and Mr. McDuffie was one of the

most ardent and eloquent champions of the doctrine of nullification, which he regarded not as a constitutional, but as a justifiable revolutionary measure. From 1820 to 1831 the legislature of South Carolina repeatedly protested against a protective tariff, and in 1832 a convention of the people of that state declared such acts to be null and void, and forbade that they should be enforced within the limits of the state. The convention also published two addresses, one to the people of South Carolina and the other to the people of the United States, the latter of which was written by Mr. McDuffie. In 1834 he left congress, after making a vehement speech against the administration, and in the same year was elected governor of South Carolina. The college of the state was reorganized by his efforts. At the expiration of his term of office he retired to private life, but in 1842 was elected to the United States senate. The failure of his strength obliged him to resign this office and to terminate his public career in 1846. He was one of the most successful planters in the state, and left an admirable oration delivered before the state agricultural society. For many years before his death he was commonly called Gen. McDuffie, having been a major general in the state militia.

**MACE.** See NUTMEG.

**MACE, Jean**, a French author, born in Paris, April 22, 1815. He studied and taught at the Stanislas college, and subsequently was professor in other institutions. He was for some time in the army, until a substitute was purchased for him by Prof. Burette, his former teacher of history, whose secretary he was till his death in 1847. An ardent republican, he was connected with the press after the revolution of 1848, and was expelled from Paris after the *coup d'état* of Dec. 2, 1851. He was professor till 1861 in a female seminary in Alsace, where he prepared his *Histoire d'une bouchée de pain* (Paris, 1861), which was followed in 1866 by a sequel entitled *Les serviteurs de l'estomac*. These works have been translated into English, and published under the titles, "History of a Mouthful of Bread," and "The Servants of the Stomach." He also wrote fairy stories, which have been translated by Mary L. Booth, under the title, "Macé's Fairy Book" (New York, 1866). In 1864, in conjunction with Stahl, he founded *Le Magasin d'Éducation et de Recréation*; and he describes in his *Morale en action* (1865) the working of the society which he had established for communal libraries in the department of Haut-Rhin. In 1866 he founded in Paris a society called "The League of Instruction," of which he continues to be the president (1874). Among his more recent writings are *L'Œil* (1869); *Lettre d'un paysan d'Alsace à un sénateur* (1870); and *La séparation de l'église et de l'école*, and *La demi-instruction* (1872).

**MACEDO, Joaquim Manoel de**, a Brazilian author, born at San João de Itaboraí, June 24,

1820. He took his degree at Rio de Janeiro, where he was made professor of Brazilian history, and in 1854 became a member of the legislature. His most popular novels are *Moreninha* ("Little Brown Girl," 1844 and 1849) and *O moço louro* ("The Yellow Youth," 1845; 2d ed., 1854). Among his other works are *Cobé*, a tragedy, and *A Nebulosa*, an epic (1857).

**MACEDONIA**, or *Macedon* (the latter name being used, exclusively by English writers, to designate the state or empire, the former designating the land or province), an ancient country of S. E. Europe, N. of Greece, the principal parts of which now form the Turkish vilayet of Selanik (Salonica), the population consisting of Turks, Wallachs, Albanians, Greeks, and Jews. Parts of this country are renowned in modern times for fertility, producing among others abundant and excellent crops of wheat, cotton, tobacco, wine, oil, and fruits. Its most ancient name among the Greeks seems to have been Emathia, and subsequently Macetia or Maxetia, the people being called Macetæ. The name Macedonians is first applied to them by Herodotus. They were probably of Illyrian race, and seem originally to have lived in the S. W. part of the country, in the vicinity of Mt. Pindus, whence they spread northeastward, mingling with Thracian as well as Grecian settlers. The reigning house of Macedon is believed to have belonged to the descendants of the latter, or to a Hellenized tribe, and their influence gradually extended the use of the Greek language; but the people were never regarded as genuine Hellenes by their neighbors of the Grecian peninsula and the islands. The boundaries of Macedonia varied in the different periods of its history. In the time of Herodotus, or at least according to him, it consisted only of the district extending from the confines of Thessaly to the river Lydias. In a subsequent period it extended E. as far as the Strymon (now Struma), which separated it from Thrace, being bounded N. by Pæonia, W. by Illyria, and S. by Olympus and the Cambunian mountains, which separated it from Thessaly. This may be called Macedonia proper. Philip, the father of Alexander the Great, extended the limits of his kingdom by the conquest of Pæonia on the north, of the Thracian district between the Strymon and the Nestus (Kara-su) on the east (afterward Macedonia Adjecta), of the peninsula of Chalcidice on the southeast, and of an adjoining district of Illyria on the west. Thus his kingdom was bounded N. by the Scardus, Scomius, and Orbelus ranges, separating it from Mæsia and Dardania, E. by the Rhodope range and Nestus river, separating it from Thrace, S. E. by the Ægean sea (archipelago), S. by the Olympus and the Cambunian mountains, and W. by the northern prolongation of the Pindus and the river Drilo (Drin). It comprised the districts of Pæonia, Pelagonia, Lyncestis, Orestis, Pieria, Emathia, Chalcidice, Bisaltia, and others. Besides the encircling

mountain ranges, there were some less important chains in the interior, divided by fertile valleys. Of the rivers, which mostly flow in a S. E. or E. direction into the Ægean, the most important were the Nestus, the Strymon, which flows into the gulf of its name, and the Axios (Vardar), which receives the waters of the Lydias, and like the Haliacmon (Vistritza) flows into the Thermaic gulf (gulf of Salonica). The southern part of Chalcidice, washed by the Thermaic, Toronaic, Singitic, and Strymonic gulfs, was divided into the three minor peninsulas of Pallene, Sithonia, and Acte, the last of which terminated in Mt. Athos, and a canal was said to have been cut through it by Xerxes on his invasion of Greece. Among the cities were: Ægæ, or Edessa, the residence of the early kings; Pella, that of Philip and his son Alexander; Thessalonica (Salonica, now the largest town), that of Cassander, at the head of the Thermaic gulf; Olynthus, formerly one of the most powerful cities of Thrace, besieged, taken, and destroyed by Philip; Potidæa, a colony of Corinth, conquered by Athens, and subsequently by Philip; Chalcis, a colony of the town of the same name in Eubœa; Amphipolis, a colony of Athens, near the mouth of the Strymon; Philippi, founded by Philip, and renowned for the battle of its name (42 B. C.), which terminated with the victory of the triumvirs and the death of Brutus and Cassius; Stagira, the birthplace of Aristotle; Pydna, where Perseus was defeated by the Romans under Æmilius Paulus (168 B. C.); Diium, Pelagonia, Berœa, Methone, Stobi, and Acanthus. Under the Romans the province of Macedonia included large portions of the neighboring western and southern countries, extending from the Ægean to the Adriatic, and being bounded S. by the province of Achaia, which included the largest part of Greece.—Macedon, having been founded by Perdicaas I., first appeared in history under Amyntas, a contemporary of Darius, the first Persian invader of Greece (about 500 B. C.), was made powerful and the virtual mistress of Greece by Philip (359–336), son of Amyntas II., and the greatest empire of the period by the conquests of his son Alexander (336–23), decayed under the successors of the latter, was broken by the two victories of the Romans at Cynoscephalæ (197) and Pydna (168), and made a Roman province after various insurrections and the final defeat of the Achæans in 146. Its history is closely connected with that of Greece, and we refer our readers to the history of that country, as well as to the lives of the most important Macedonian monarchs.—*The Géographie ancienne de la Macédoine*, by M. Desdèvises du Dezert (Paris, 1863), which also treats the history of the country, is probably the most accurate and exhaustive work that has yet appeared on ancient Macedonia.

**MACEIO**, or *Maçayó*, a city of Brazil, capital of the province of Alagoás, 1,050 m. N. N. E. of Rio de Janeiro, and 120 m. S. S. W. of Per-

nambuco; pop. about 8,000. It stands about 1 m. inland, on a slight elevation, surrounded by cocoa palm groves. It has a parish church and two other churches, and a Latin and two or three primary schools. Its port, Jaguará, is partially sheltered by a line of coral reefs; but in spite of excellent piers, built out from the beach, shipping cannot come alongside, and goods are landed and loaded by lighters. The chief industries are agriculture and the manufacture of rum and *cachaça*; ship building is carried on; and there is an extensive commerce in sugar and in cotton of superior quality.

**McENTEE, Jervis**, an American painter, born in Rondout, N. Y., July 14, 1828. He studied in the studio of Frederick E. Church in 1850, but in 1852 engaged in business in Rondout, which he relinquished three years later. In 1858 he opened a studio in New York, and has been successful as a delineator of northern scenery, especially in its more sombre aspects. He has recently paid much attention to figure painting. Among his principal works are: "The Melancholy Days have come" (1861); "Virginia" and "Indian Summer" (1862); "The Wilderness" and "In the Kaatskills" (1863); "Late Autumn" (1864); "October in the Kaatskills" and "Woods of Asshokan" (1866); "Last Days of Autumn" (1867); "October Snow" (1870); "November Days" and "Danger Signal" (1871); "Sea from Shore" and "The Pine Tree" (1872); "A Wood Path" and "Solitaire" (1873); and "A Song of Summer" (1874). The last three are figure pictures.

**MACERATA.** I. An E. province of Italy, bordering on Ancona, Umbria, Ascoli Piceno, and the Adriatic; area, 1,057 sq. m.; pop. in 1872, 236,994. The two former papal delegations of Macerata and Camerino constitute the present two districts of the province. It is remarkable for its picturesque scenery. The surface of the district of Camerino is so mountainous that only one third of the soil is susceptible of cultivation; the highest summits of the Apennines here are the Pennino and San Cataldo. The highest point in the district of Macerata is the San Vieino. This district is watered by the Potenza, Chienti, and many other streams, and the soil is favorable to almost every kind of agricultural production. The principal towns, besides the capital, are Recanati, Tolentino, and Camerino. II. A city, capital of the province, situated in the midst of hills between the Chienti and Potenza valleys, and commanding views of the Apennines and Adriatic, 21 m. S. of Ancona; pop. about 11,000. It is walled and has six gates, one (Porta Pia) resembling a ponderous triumphal arch. The town and its suburbs are old, but contain fine streets and houses and several palaces. In the cathedral, situated in a large but irregular square, is a picture ascribed to Perugino. It formerly possessed a university, but the institution has lost that distinctive character, though various branches of learning are

still taught there. In the Palazzo Compagnoni is a museum of relics, chiefly found among the neighboring ruins of the Roman colony Helvia Ricina. The communal library has over 30,000 volumes. Outside of the gate leading to Fermo is the largest hall in Italy for the national game of *pallone* (football). The trade is active in agricultural products and in cattle, and wool, honey, and wax are exported.

**MACFARREN, George Alexander**, an English composer, born in London, March 2, 1813. He studied music under Mr. Lucas and in the royal academy, where he became professor of harmony in 1838. He was one of the founders of the society of antiquarian musicians, whose object was the publication of the works of English musicians of the 16th and 17th centuries. About 1840 his sight began to fail, and he has since become totally blind, notwithstanding which he has continued to write and teach. In 1840 he published "Rudiments of Harmony," and the difference between the views therein set forth and those generally held was so great that he was obliged to resign his professorship; but he was reinstated in 1851, and the work is now held in high esteem. His first important musical composition was a symphony in F minor; a second symphony was also successful. He has composed several overtures, one of which was performed by the Gewandhaus orchestra under Mendelssohn's direction in 1843, two quartets for stringed instruments, and pianoforte pieces. His operas are: "The Devil's Opera" (1838); "Don Quixote" (1846); "King Charles II." (1849); and "Robin Hood" (1860). The last named ran for a whole season. He has written several fine cantatas, one of which, "The Sleeper Awakened" (1850), ranks among the best of his works. Another, "Outward Bound," was performed at the Norwich musical festival in 1872. He has also published numerous musical essays and criticisms, and "Six Lectures on Harmony" (1867), and arranged "Old English Ditties" (13 books, 1857-'69), "Moore's Irish Melodies," and "Scotch Songs."

**McFERRIN, John Berry**, an American clergyman, born in Rutherford co., Tenn., June 15, 1807. He received a common school education, and in 1826 joined the Tennessee conference of the Methodist Episcopal church. For two years he was a missionary to the Cherokee Indians. In 1840 he was appointed editor of the "Southwestern Christian Advocate" at Nashville; and in May, 1858, he was made book agent of the M. E. church, South. In 1866 he was elected corresponding secretary of the board of domestic missions of the same church, and on the consolidation of the foreign and domestic boards in 1870 he was made corresponding secretary of the joint board, in which office he still (1874) continues. He took an active part in the discussions of the general conference of 1844, and was a member of the Louisville convention of 1845, which organized the Methodist Episcopal church, South. He

aided in the compilation of "Redford's History of the Organization of the Methodist Episcopal Church, South."

**McGEE, Thomas D'Arcy**, an Irish journalist, born in Carlingford, Ireland, April 13, 1825, assassinated in Ottawa, Canada, April 7, 1868. In 1842 he emigrated to America, taking up his residence in Boston, where he became a contributor to and soon editor of "The Pilot," a Roman Catholic newspaper. In 1845 he returned to Great Britain, and became parliamentary correspondent of the Dublin "Freeman's Journal." The repeal movement of 1846 having failed, McGee became a leading writer for the Dublin "Nation," and was secretary of the "Irish Confederation," an association which disapproved of O'Connell's policy. In 1848 McGee again came to the United States, where for nine years he published a newspaper, at first called "The New York Nation" and afterward "The American Celt," devoted mainly to the interests of adopted citizens. He also delivered numerous lectures, and established societies to promote emigration and naturalization. In 1857 he removed to Montreal, Canada, where he established a tri-weekly newspaper, "The New Era." He was soon elected a member of the provincial parliament, and was subsequently returned at each successive election until his death. He was twice a member of the colonial ministry as secretary for agriculture and emigration, and once as president of the executive council. He was an early advocate of the confederation of the British American colonies, and framed the draft of the plan of union which has been substantially carried into effect. He was returning from a night session of parliament, when he was shot at the door of his hotel by a man named Whealen, in consequence, it is supposed, of his opposition to the Fenian movement. McGee wrote numerous works, including "History of the Irish Settlers in North America, from the earliest period to 1850" (Boston, 1851); "History of Attempts to establish the Protestant Reformation in Ireland" (1853); "Sketches of O'Connell and his Friends" (1854); "Catholic History of North America, and the Relations of Ireland and America" (1855); "Popular History of Ireland" (2 vols. 8vo, New York, 1863); and "Speeches and Addresses on the British American Union" (London, 1865). A volume of his poems has been published with an introduction by Mrs. Sadlier (New York, 1870).

**MacGEOGHEGAN, James**, an Irish historian, born near Mullingar, county Westmeath, about 1698, died in Paris, probably in 1760. He was the son of a farmer, was educated for the church at Rheims and took holy orders, was attached to a church in Paris, and became chaplain of the famous Irish brigade. At the request of several exiled nobles and chiefs in the brigade, he wrote his "History of Ireland, Ancient and Modern," published in French (1758; English translation by Patrick O'Kelly,

3 vols., Dublin, 1835; 1 vol., 1844). It has been reprinted in New York, with a continuation from the treaty of Limerick to a recent date, by John Mitchel (1868).

**McGILLIVRAY, Alexander**, a chieftain of the Creek or Muscogee Indians, born on the Coosa river near the present site of Wetumpka, Ala., about 1740, died in Pensacola, Feb. 17, 1793. He was the son of Lachlan McGillivray, a Scotch Indian trader, and the half-breed daughter of a French officer. He was educated in Charleston, and at one time was placed in a counting house in Savannah, but returned on arriving at manhood to his Muscogee relatives. He rose to a high position among the united tribes of Creeks and Seminoles, and at the breaking out of the American revolution was their recognized head. During the war the McGillivrays, father and son, were zealous adherents of the royal cause. After its close Alexander McGillivray, in behalf of the Muscogee confederacy, entered into an alliance with Spain, of which government he was made a commissary. He diverted the trade of the Creeks to Pensacola, and for several years baffled the efforts of the United States government to recover it. At length, in 1790, he visited New York, and signed a treaty ceding certain disputed lands on the Oconee, and by a secret article was appointed agent for the United States and brigadier general in the army. This treaty diminished his influence with the Creeks, but he succeeded in obtaining an increase of salary and of authority from the Spanish government. His hospitality and generosity were almost princely. His deportment was that of a polished gentleman; and his published correspondence affords evidence of his intelligence and skill as a politician. He was a brother-in-law of Le Clerc Milfort, and an uncle of William Weatherford.

**McGILLIVRAY, William**, a Scottish naturalist, born in the isle of Harris in 1796, died in Aberdeen, Sept. 5, 1852. In 1823 he was appointed assistant professor of natural history in the university of Edinburgh, and subsequently conservator of the museum of the royal college of surgeons. In 1841 he was made professor of natural history in Marischal college, Aberdeen, which office he held till his death. He published "Lives of Eminent Zoölogists" (1834); "History of British Birds" (1837-52); "Mammalia" (vol. vii. of Jardine's "Naturalist's Library," 1838); "Manual of Geology" (1839); "Manual of Botany" (1840; new ed., 1853); "Molluscous and Cirripedal Animals of Scotland" (1843); and a number of papers on natural history. At the time of his death he was engaged on a work entitled "The Natural History of Dee-side and Braemar," illustrative of the vicinity of the royal residence at Balmoral. The manuscript was purchased by the queen, who caused it to be printed in 1856.

**MACGREGOR, John**, a British statistician, born at Stornoway, Ross-shire, in 1797, died in Boulogne, April 23, 1857. At an early age he was

placed in a commercial house in Canada. On his return to England he was employed on commercial missions to various continental governments, and in 1840 he was appointed one of the two joint secretaries of the board of trade. He became an advocate of free-trade measures, and exerted his influence with Joseph Hume to cause the appointment in the house of commons of a select committee on the import duties. In 1847 he resigned his office and was elected to parliament for Glasgow. He established the Royal British bank, but lacked the qualifications for the governorship of such an institution, and, to escape the legal investigation which followed its failure, retired to Boulogne. He published "Sketch of British America" (1828); "Emigration to British America" (1829); "My Note Book" (1835), an account of his travels on the continent; "Commercial and Financial Legislation of Europe and America" (1841); "Commercial Statistics of all Nations" (5 vols., 1844-'50); "Progress of America from the Discovery by Columbus to 1846" (2 vols., 1847); "Holland and the Dutch Colonies" (1848); "Germany and her Resources" (1848); and "History of the British Empire, from the Accession of James I." (2 vols., 1852), a work left incomplete at his death. He was also the author of many commercial reports.

**McGUFFEY, William Holmes**, an American educator, born in Washington co., Pa., Sept. 23, 1800, died at Charlottesville, Va., May 4, 1873. He graduated at Washington college, Pa., in 1826, and was elected professor of ancient languages in Miami university, at Athens, Ohio. In 1829 he was licensed to preach as a minister of the Presbyterian church. In 1832 he was transferred to the chair of mental science. While at Miami university he prepared a series of "Eclectic" school books, which have been many times republished. He became president of Cincinnati college in 1836, of Miami university in 1839; and in 1845 he was elected professor of moral philosophy in the university of Virginia, where he remained until his death.

**McHALE, John**, an Irish archbishop, born at Tubbernavine, county Mayo, in 1790. He studied at Maynooth college, and in 1814 was ordained priest, and appointed professor of dogmatic theology. While there he published under the signature of "Hierophilus" a series of controversial letters on Bible societies, the Protestant establishment in Ireland, and Catholic emancipation. In 1825 he was appointed coadjutor to the bishop of Killala, with the title of bishop of Maronea in *partibus infidelium*. In 1827 he published "Evidences and Doctrines of the Catholic Church" (2d ed., London, 1842; 3d ed., Dublin, 1852), which was immediately translated into French and German. A second series of letters under his own name appeared at this time, and, being chiefly on the subject of Catholic emancipation, aided powerfully to stimulate public opinion. He also constructed a cathedral at Ballina, the residence of the bishop, and labored

successfully to promote the education of poor Catholic children. He went to Rome in 1831, and returned to Ireland in 1832, after preaching in the church of San Marcello a series of sermons, which were translated into Italian and published by Monsignore de Luca. In May, 1834, he became titular bishop of Killala, and in the following August was appointed archbishop of Tuam. Besides completing the cathedral begun by Archbishop Kelly, he repaired or built anew more than 100 churches in his diocese, established 14 for the Franciscan monks with free schools attached to them, and three large houses and schools for the Christian brothers. He has been the consistent advocate of separate free schools for Catholics since 1825, and has succeeded in opening one in almost every parish of his diocese. In 1848 he went to Rome, and obtained (Oct. 18) an official condemnation of the "queen's colleges;" and he has since devoted his energies to counteracting the labors of Protestant missionary societies among his flock, and promoting the establishment of exclusively Catholic schools and colleges. In 1869 he took a prominent part in procuring the censure of mixed education by a council of Irish bishops. He has published an Irish version of a part of Moore's "Irish Melodies," in the same metre as the original, with the ancient airs; an Irish version in heroic metre of six books of the Iliad (Dublin, 1861); and an English and Irish translation of the Pentateuch (1863), to be followed by the other books of the Old Testament.

**McHENRY, I.** A N. E. county of Illinois, bordering on Wisconsin, drained by Fox and Des Plaines rivers and their branches; area, 470 sq. m.; pop. in 1870, 23,762. The surface is nearly level and the soil fertile. Limestone abounds. Several divisions of the Chicago and Northwestern railroad pass through it. The chief productions in 1870 were 402,060 bushels of wheat, 1,145,005 of Indian corn, 910,397 of oats, 77,456 of barley, 303,467 of potatoes, 13,873 of flax seed, 290,022 lbs. of wool, 910,226 of butter, 192,158 of cheese, and 71,742 tons of hay. There were 10,382 horses, 16,378 milch cows, 14,944 other cattle, 64,331 sheep, and 21,181 swine; 9 manufactories of carriages, 18 of cheese boxes, 12 of saddlery and harness, 3 of sash, doors, and blinds, 3 of brick, and 12 flour mills. Capital, Dorr. **II.** A N. county of Dakota, recently formed, and not included in the census of 1870; area, about 1,650 sq. m. It is drained by Cheyenne and Mouse rivers, and contains several small lakes. There are extensive sand hills and several elevated points called buttes. The surface consists mostly of rolling prairies.

**MACHIAS**, the shire town and a port of entry of Washington co., Maine, on the Machias river, near its mouth, 120 m. E. by N. of Augusta, and 35 m. S. by W. of Calais; pop. in 1870, 2,525. It is connected by steamer with Portland, and a railroad, 7½ m. long, used in transporting lumber, extends from Machiasport



to Whitneyville. The value of foreign commerce for the year ending June 30, 1873, was \$149,213; entrances, 34 of 1,836 tons; clearances, 157 of 23,940 tons. The entrances in the coastwise trade were 102 of 72,691 tons; clearances, 3 of 656 tons; number of vessels belonging to the port, 198 of 21,697 tons; built during the year, 26 of 7,027 tons. A few vessels are employed in the cod and mackerel fishery. The town contains an iron foundry, manufactories of sash and blinds and of harness, several ship-building establishments, a savings bank, three hotels, two weekly newspapers, and six churches. The first permanent settlement was made in 1763. The town was incorporated in 1784.—MACHIASPORT (pop. in 1870, 1,526), on Machias bay, at the mouth of Machias river, was separated from Machias and incorporated as a distinct town in 1826. It has an excellent harbor, and contains several boat and ship-building establishments.

**MACHIAVELLI, Niccolò**, an Italian statesman, born in Florence, May 3, 1469, died there, June 22, 1527. His father, Bernardo Machiavelli, was a lawyer who traced back his ancestry to Hugo, marquis of Tuscany, about the middle of the 9th century; his mother, a woman of talent and a poetess, was descended from the counts of Borgo Nuovo, who flourished in the 10th century. Many of his ancestry on both sides had filled the most important offices in the republic of Florence; of the Machiavellis 13 had held the post of gonfaloniere of justice, and 53 that of prior. In June, 1493, Niccolò entered the service of the state, having been chosen to the office of chancellor of the second chancery of the seignior. In the following month he was appointed secretary to the "ten of liberty and peace," a body of magistrates to whom was intrusted the supreme government. In this office, to which he owes his title of secretary of the Florentine republic, he continued 14 years. The position of Florence at that period was one of great importance, and the relations of the republic with the principal powers of Europe were such as required the highest qualities of statesmanship for their proper conduct. Machiavelli was charged with the political correspondence of the government, both foreign and domestic, and with a wide range of diplomatic functions. He was employed in 23 foreign embassies, among which were four to the court of France and two to the emperor Maximilian. He was also intrusted with various commissions to the cities dependent on Florence. His first mission was to France in 1500, and his fourth and last to that court was in 1511. In 1502 he was envoy from the republic to Cesare Borgia, duke of Valentino; and in 1507 he was sent as ambassador to the emperor. His correspondence with his government during these missions was extensive, and his despatches are models of diplomatic style, forming one of the most instructive and entertaining collections of state papers that have

ever been published. In the internal administration of Florence, the sagacity and energy of Machiavelli were as conspicuous as in his diplomatic correspondence. The practice of employing mercenary troops he regarded as one great cause of the weakness of the Italian states; and having studied in all its details the art of war, he exerted himself with ardor to organize a national militia, which for a time acquitted itself successfully in the field. But, distracted by faction and embarrassed by the weakness and vacillation of the chief magistrate Piero Soderini, who had been made gonfaloniere for life, the republic was unable long to contend with her formidable enemies, the pope and the emperor, who had combined to restore the Medici by force of arms. The military and political institutions of the republic were swept away together, and in 1512 the Medici returned in the train of foreign invaders from their long exile. Though his project of a national militia had failed to preserve Florence from her own dissensions and the overwhelming force of her enemies, Machiavelli clung to it with patriotic tenacity. To vindicate it from some popular objections, and to refute some prevailing errors on the subject of military science, he wrote at this time his work on the "Art of War," which however was not printed till 1521. This treatise is in the form of a dialogue between Cosimo Rucellai, a Florentine gentleman, and Fabrizio Colonna, an officer in the service of Spain. The new government soon began to persecute Machiavelli. Three decrees were passed against him within the course of ten days. By the first two he was deprived of office and condemned to a year's banishment from the city; the third decree mitigated his sentence to a simple prohibition to enter the palace of the seignior. He went into retirement, but the freedom with which he spoke and wrote on public affairs displeased the government; and in the following year (1513) he was accused, apparently without reason, of being concerned in an extensive conspiracy just discovered against the cardinal de' Medici (shortly afterward Leo X.), and thrown into prison. He was put to the torture, but confessed nothing. For some time he was kept chained in a dungeon, but soon after the accession of Leo X. to the papacy he was included in an amnesty and was liberated. That pope, who possessed great influence in the government of Florence, and admired Machiavelli's literary merit, at length began gradually to recall him to public life. He consulted him on various important affairs of state, and invited him to prepare a plan for the government of Florence. In 1521 he sent him on a mission to the Franciscan friars at Carpi. He was next employed to direct the new fortifications of Florence, and subsequently sent to Venice on a mission of importance. While there he received the welcome tidings that his name had been again inserted in the list of citizens of Florence who were held eligible to office. He found in Pope Clement

VII. a firm friend, and was afterward employed in many important negotiations. His last employment was in the army of the league against Charles V., after which, returning to Florence, he was seized with violent pains in the stomach, and soon died. His body was interred in Santa Croce, where two centuries afterward an English nobleman, Earl Cowper, erected a monument to his memory.—Of the writings of Machiavelli, the most celebrated is the treatise commonly called *Il principe*, "The Prince," which was written about 1514 and printed in 1532. This work, until recently, was almost universally condemned as designed to teach the vilest arts of despotism, and to present as a model sovereign of an absolute state the perfidious and ferocious Borgia. Scarcely any book of ancient or modern times has been so violently assailed or has excited so much discussion and controversy. The terms in which its author was commonly described, says Macaulay, "would seem to import that he was the tempter, the evil principle, the discoverer of ambition and revenge, the original inventor of perjury; that before the publication of his fatal 'Prince' there had never been a hypocrite, a tyrant, or a traitor, a simulated virtue, or a convenient crime." The researches of modern Italian scholars, and a better consideration of the political state of Italy in the 15th century, have at length established the true object of "The Prince," and vindicated in some measure the name of its author from the opprobrium heaped upon it. The work is a scientific account of the art of acquiring and preserving despotic power, and is a calm, unvarnished, and forcible exposition of the means by which tyranny may be established and sustained. If it be a guide to princes desiring to become despotic, it is also, as Machiavelli himself remarked, a guide to the people who wish to destroy tyrants. It weakens despotism by exposing its most subtle secrets. At the same time it exhibits an obliquity of moral principle on the part of its author, so far as political matters are concerned, which can only be palliated by alleging that dissimulation and treachery were universally looked upon in Italy, and indeed throughout Europe in his day, as legitimate political weapons. About a year after the composition of "The Prince" Machiavelli wrote "Discourses on the First Decade of Livy," divided into three books. He also wrote a "History of Florence" (*Istorie fiorentine*), a work greatly admired for its style, several poems of no great merit, and three or four comedies, of which the best is "The Mandragola," which was acted in Florence with great success. The fullest and best edition of the works of Machiavelli was published at Florence in 1813, in 8 vols. 8vo. The "History of Florence," "The Prince," and various historical tracts, are in Bohn's "Standard Library" (1 vol., London, 1847). Several of the writings of Machiavelli were early translated in England (1560-1600). All his works

were translated into English by Ellis Farneworth (2 vols. 4to, 1761, and 4 vols. 8vo, 1775).—See Periès, *Histoire de N. Machiavel* (Paris, 1823), and Artaud de Montor, *Machiavel, son génie et ses erreurs* (2 vols., 1833).

**MACHINE**, and **Machinery**. See **MECHANICS**.

**MACIEJOWSKI**, **Waclaw Alexander**, a Polish historian, born in 1792. He completed his studies in Germany, and was professor of Roman law in the university of Warsaw from 1819 till its suppression in 1831. He subsequently taught ancient literature in the Catholic academy, and Roman law in the gymnasium. His principal works are: *Historia prawodawstwa słowiańskich* ("History of Slavic Jurisprudence," 4 vols., Warsaw, 1832-'5; German translation, Stuttgart, 1835-'9); and *Pamiętniki o dziejach, piśmiennictwie i prawodawstwie słowian*, relating to Slavic history, literature, and jurisprudence (2 vols., 1839).

**McILVAINE**, **Charles Pettit**, an American bishop, born in Burlington, N. J., Jan. 18, 1798, died in Florence, Italy, March 12, 1873. He graduated at Princeton college in 1816, was admitted to orders in 1820, and labored for two or three years in Christ's church, Georgetown, D. C. In 1825 he was appointed professor of ethics and chaplain in the military academy, West Point, and in 1827 became rector of St. Ann's church, Brooklyn, N. Y. He was chosen in 1831 professor of the evidences of revealed religion and sacred antiquities in the university of the city of New York, and delivered a valuable course of lectures, which were subsequently published. He was in the following year elected bishop of Ohio, and was consecrated Oct. 31, 1832. As head of Kenyon college and of the theological seminary in his diocese, as well as by his zeal and activity in the discharge of his episcopal duties, he exercised a large and powerful influence in the Episcopal church. In 1853 he received the degree of D. C. L. from the university of Oxford, and in 1858 that of LL. D. from the university of Cambridge. He was a member of the sanitary commission during the civil war, and did the country service on a visit to Europe in setting forth right views of the questions at issue. He was also present at the "Pan-Anglican" council in London in 1867. Failure of health induced him to visit Europe again just before his death. His principal publications were: "Lectures on the Evidences of Christianity" (1832), which has passed through 30 editions; "Oxford Divinity compared with that of the Roman and Anglican Churches" (1841); "The Holy Catholic Church" (1844); "No Priest, no Altar, no Sacrifice but Christ," and "Reasons for refusing to consecrate a Church having an Altar" (1846); "The Truth and the Life," 22 discourses, published at the request of the convention of Ohio (1850); and "Righteousness by Faith" (1864). He edited "Select Family and Parish Sermons" (2 vols., 1839).

**McINTOSH**, a S. E. county of Georgia, bounded S. E. by the Atlantic ocean, and S. W. by

the Altamaha river; area, 550 sq. m.; pop. in 1870, 4,491, of whom 3,288 were colored. It is drained by the Sapelo river and Jones's and Doctor's creeks. The surface is level and the soil fertile. It is intersected by the Atlantic and Gulf railroad. The chief productions in 1870 were 23,638 bushels of Indian corn, 26,438 of sweet potatoes, 4,900,389 lbs. of rice, and 5,019 gallons of cane molasses. There were 1,800 milch cows, 3,055 other cattle, 684 sheep, and 4,449 swine; 9 lumber mills, and 3 brick and stone yards. Capital, Darien.

**McINTOSH, John**, an American soldier, born in McIntosh co., Ga., about 1755, died Nov. 12, 1826. He was an officer of the Georgia line in 1775, and as lieutenant colonel defended the fort at Sunbury, in Liberty co., when it was besieged by Lieut. Col. Fraser, at the head of a considerable body of British troops. At the battle of Brier creek, March 3, 1779, he displayed great bravery, only surrendering when further resistance was impossible. After the close of the war he removed to Florida, and settled on the St. John's river. Here he was suddenly arrested by a band of Spanish troops and imprisoned in the fortress of St. Augustine, on suspicion of having designs against the Spanish government, and was finally sent to the captain general of Cuba, and by him incarcerated in the Morro castle at Havana. After nearly a year's imprisonment he was released, and returned to Georgia, but not until he had aided in destroying a fort on the St. John's opposite Jacksonville, and done the Spanish government some other injuries. In the last months of the war of 1812 he served at Mobile.

**McINTOSH, Lachlan**, an American soldier, born at Borlam, near Inverness, Scotland, March 17, 1725, died in Savannah, Ga., Feb. 20, 1806. His father, John More McIntosh, with 100 highlanders, came to Georgia with Gen. Oglethorpe in 1736, and settled in the lower part of the state, at the place now known as Darien, but called by them Inverness. He became a clerk in a counting house at Charleston, where he remained until called on, Sept. 16, 1776, to take command of the first regiment organized in Georgia. Subsequently three regiments were raised, and he was appointed a brigadier general. In 1777 he fought a duel near Savannah with Button Gwinnett, who was fatally wounded. Gen. McIntosh now accepted a command in the central army under Washington, who selected him to conduct a campaign against the Indians in the west in 1778. With a small force he succeeded in restoring peace on the frontier. In 1779 he took command of the Georgia troops at Augusta, whence he subsequently marched to Savannah, in the siege of which place he commanded the first and fifth South Carolina regiments, and bore an active part. After the failure of the siege he retreated to Charleston, and was present there when the city surrendered to Sir Henry Clinton, May

12, 1780, after which he was a prisoner of war for a long time. He was a member of congress in 1784, and a commissioner to treat with the southern Indians in 1785.

**McINTOSH, Maria J.**, an American authoress, born in Sunbury, Ga., in 1803. She was educated at the Sunbury academy, about 1835 removed to New York, and published in 1841 her first tale, "Blind Alice," under the pseudonym of "Aunt Kitty." It was followed by "Jessie Graham," "Florence Arnott," "Conquest and Self-Conquest," "Praise and Principle," and other tales published between 1841 and 1846. In 1846 she published "Two Lives, or to Seem and to Be," and in the succeeding year her stories were collected in a single volume. Among her other works are: "Charms and Counter-Charms" (1848); "Donaldson Manor" (1849); "Woman in America" (1850); "The Lofty and the Lowly" (1853), a picture of life on a southern plantation; "Violet, or the Cross and the Crown" (1856); "Meta Gray" (1858); and "Two Pictures" (1863).

**McKAY, Charles**, a British author, born in Perth in 1812. He was educated in London and Brussels. From 1834 to 1844 he was on the staff of the London "Morning Chronicle," and from 1844 to 1847 editor of the Glasgow "Argus," after which he returned to London, where he still resides (1874). He lectured in the United States in 1858, and in 1860 established the "London Review." From 1862 to 1865 he was in the United States as correspondent of the London "Times" on the subject of the civil war. He has published "Songs and Poems" (1834); "The Hope of the World, and other Poems" (1840); "Longbeard," a romance (1840); "Memoirs of Extraordinary Popular Delusions" (3 vols., 1841); "The Salamandrine," a poem (1842); "Legends of the Isles, and other Poems" (1845); "The Scenery and Poetry of the English Lakes," and "Voices from the Crowd" (1846); "Voices from the Mountains" (1847); "Town Lyrics" and "The Battle," a poem (1848); "Egeria, or the Spirit of Nature, and other Poems" (1850); "The Lump of Gold, and other Poems," "The Song of the Brave," and "Ballads and other Poems" (1856); "Under Green Leaves" (1857); "A Man's Heart" (1860); "Studies from the Antique, and Sketches from Nature" (1864); "Under the Blue Sky" (1871); and "Lost Beauties and Perishing Graces of the English Language" (1874).

**McKEAN**, a N. county of Pennsylvania, bordering on New York; area, about 1,000 sq. m.; pop. in 1870, 8,825. It is drained by the Alleghany river and branches, and numerous creeks. The surface is hilly, the soil of slate and shale formation, and it abounds with coal, iron, and salt. The Buffalo, Bradford, and Pittsburgh railroad passes through it. The chief productions in 1870 were 8,444 bushels of wheat, 22,620 of Indian corn, 97,984 of oats, 54,983 of potatoes, 23,016 lbs. of wool, 197,200 of butter, and 15,243 tons of hay.

There were 1,178 horses, 2,199 milch cows, 3,238 other cattle, 7,288 sheep, and 962 swine. Capital, Smithport.

**MACKEAN, Thomas**, an American jurist, and a signer of the Declaration of Independence, born in Chester co., Pa., March 19, 1734, died in Philadelphia, June 24, 1817. In 1757 he was admitted to the bar, and in 1762 was elected a member of the Pennsylvania assembly, to which he was annually returned for the next 17 years. In 1765 he attended the general congress of the colonies at New York, and formed one of the committee who framed the address to the British house of commons; and in the same year he was appointed judge of the court of common pleas for New Castle county. In September, 1774, he took his seat in the first continental congress, as a delegate from the lower counties in Delaware. He was a member of congress, of which he was elected president in 1781, until February, 1783, being the only member who served without interruption during the whole revolutionary period. In 1777, while still a representative in congress from Delaware, he was appointed chief justice of Pennsylvania, and in the same year he also officiated as president of the state of Delaware, for which he drew up a constitution. He retired from the bench in 1799, on being elected governor of the state. His administration lasted until 1808, when he withdrew from public life. As a jurist he held a high position for integrity, impartiality, and learning. In politics he was one of the leaders of the republican party, the ascendancy of which in Pennsylvania was in no small degree owing to his exertions.

**McKEEVER, Isaac**, an American naval officer, born in Pennsylvania in April, 1793, died in Norfolk, Va., April 1, 1856. He entered the navy as a midshipman in 1809, was made a lieutenant in 1814, and commanded one of a flotilla of five gunboats under the command of Lieut. Thomas ap Catesby Jones, which was captured by a British expedition upon Lake Borgne, La., in December, 1814. The gunboats mounted collectively 23 guns, and were manned by 182 men. The British expedition consisted of 42 large barges and other boats, manned by over 1,000 seamen and marines. The engagement, which was very severe, lasted more than three hours, and over 200 of the British were killed and wounded. Lieut. McKeever's vessel was the last one attacked, and he was severely wounded, together with most of his officers, before he surrendered. He became a commander in 1830, and a captain in 1838, performing much active service in both grades. He commanded the squadron on the coast of Brazil from 1851 to 1854. In 1855 he commanded the navy yard at Norfolk, Va.

**McKENDREE, William**, an American bishop, born in King William co., Va., July 5, 1757, died March 5, 1835. He served several years in the American army of the revolution, attained the rank of adjutant, and was present at the

surrender of Cornwallis. In 1787 he joined the Methodist conference, and in 1794 he accompanied Asbury in his tour to South Carolina. From 1795 to 1799 he travelled vast circuits in eastern and southern Virginia, and in 1800 accompanied Bishops Asbury and Whatcoat into Tennessee and Kentucky to superintend the western conference, which then comprised Ohio, Kentucky, Tennessee, and portions of Virginia and Illinois. He most effectively directed the labors of the itinerant ministers, by which churches were gathered throughout all this extensive, thinly populated section, till 1808, when he was elected bishop. The next year was spent with Asbury in a visitation of nearly all parts of the United States and portions of Canada. Through much bodily infirmity Bishop McKendree continued his laborious superintendency till his death.

**McKENDREE COLLEGE.** See **LEBANON, Ill.**

**MACKENZIE, Sir Alexander**, a Scottish traveller, born probably in Inverness, died in 1820. He emigrated to Canada when a young man, and obtained a situation in the counting house of Mr. Gregory, one of the partners in the northwest fur company. In 1789 he set out on an exploring expedition from Fort Chipewyan, on Lake Athabasca, where he had been stationed for about eight years, with four canoes and a party of 12 persons. For six weeks he threaded his way along the rivers and lakes of British America, till he reached the great northern ocean in lat. 69°. Having returned to Fort Chipewyan, he started in October, 1792, to explore the country toward the Pacific, reaching that ocean July 23, 1793, and regaining in safety the point of departure. He published a detailed account of these explorations, under the title of "Voyages from Montreal, on the River St. Lawrence, through the Continent of North America, to the Frozen and Pacific Oceans, in the years 1789 and 1793" (London, 1801). He was knighted, and the river by which he had descended from Slave lake to the ocean was called after him.

**MACKENZIE, Alexander Slidell**, an American naval officer, born in New York, April 6, 1803, died in Tarrytown, N. Y., Sept. 13, 1848. His name was originally Slidell; that of Mackenzie, the name of his mother, was added to his own in 1837, at the request of a maternal uncle. He entered the navy as a midshipman in 1815, and made his first cruise to the Mediterranean in the frigate *Java*, commanded by Capt. Oliver H. Perry. In 1822 he took command of a merchant vessel to improve himself in seamanship. He was made lieutenant in 1825, and commander in 1841, and in both grades was in active duty in the Mediterranean, the West Indies, the Brazilian waters, and the Pacific. In 1842 he commanded the brig *Somers*, manned chiefly by naval apprentices; and on his passage from the coast of Africa in the autumn of that year, the existence of a mutinous plot on board was discovered, the principals of which were immediately placed in close

confinement. A council of officers was called, which, after a careful investigation, decided that the conspiracy had already attained a formidable growth; and as the mutinous spirit evidently increased, even while the investigation was in progress, the immediate execution of the three persons principally implicated was recommended. This recommendation was carried into effect at sea, Dec. 1, 1842. The Somers soon afterward arrived in New York, when a court of inquiry was immediately ordered to investigate the affair. The result was a full approval of the conduct of Mackenzie. Subsequently a court martial was held upon him at his own request, and the trial resulted in his acquittal. He was ordnance officer at the siege of Vera Cruz, and commanded a division of artillery, detached from the fleet, on the storming of Tabasco in 1847. He published "A Year in Spain" (2 vols., 1829; enlarged ed., 3 vols., 1836); "Popular Essays on Naval Subjects" (2 vols., 1833); "The American in England" (2 vols., 1835); "Spain Revisited" (2 vols., 1836); "Life of John Paul Jones" (2 vols., 1841); "Life of Oliver H. Perry" (2 vols., 1841); and "Life of Stephen Decatur" (1846). He also left in manuscript a journal of a tour in Ireland.

**MACKENZIE, Henry**, a Scottish author, born in Edinburgh in August, 1745, died there, Jan. 14, 1831. He was educated at the university of Edinburgh, studied law there and in London, and became attorney for the crown in Edinburgh. His novel "The Man of Feeling" was published anonymously in 1771. Its popularity induced a Mr. Eccles of Bath to lay claim to the authorship, and to support his pretensions by a copy transcribed in his own hand, with interlineations and corrections. It became necessary, therefore, for Mackenzie to acknowledge himself the author. His second novel, "The Man of the World" (1783), was followed by "Julia de Roubigné." He was the editor of the "Mirror," which appeared once a week for 17 months from January, 1779, and contributed to it 42 papers; and of the "Lounger," which continued for about two years from February, 1785, to which he furnished 57 papers. Among these are his "Story of La Roche" and a kindly criticism of the poems of Burns. For the highland society he wrote a "Report on the Ossianic Controversy," against the genuineness of the poems. He was likewise the author of political tracts in the Tory interest, and in 1804 received the appointment of comptroller of taxes for Scotland. His collected works (8 vols., 1808) contain three tragedies, two of which had been performed.

**MACKENZIE, Robert Shelton**, an American journalist, born at Drew's Court, county Limerick, Ireland, June 22, 1809. He was educated at Fermoy, and at the age of 13 was apprenticed to a surgeon apothecary in Cork. After passing his medical examination he opened a school in Fermoy, and in 1829 he became the editor of a country journal published in Stafford-

shire, England. In 1845 he became editor of a railway journal in London. In 1852 he arrived in New York, and in 1857 became literary and foreign editor of the "Philadelphia Press," a post which he still holds (1874). He wrote a considerable part of "The Georgian Era," a collection of biographies (4 vols., London, 1832-'4), and has published "Lays of Palestine" (1829); "Titian," an art novel, the scene of which is laid in Venice (1843); a treatise on "Partnership en Commandité" (1847); "Mornings at Matlock" (3 vols., 1850), a collection of fugitive magazine pieces; Sheil's "Sketches of the Irish Bar" (New York, 1854), with memoirs and notes; an edition of the "Noctes Ambrosianæ," with sketches of the principal contributors and numerous notes (5 vols., 12mo, New York, 1854); "Bits of Blarney" (1855); an edition of Curran's life by his son (1855); one of Dr. William Maginn's writings (5 vols., 1855-'7); "Tressilian and his Friends" (1859); an edition of the "Memoirs of Robert Houdin" (Philadelphia, 1859); "Life of Charles Dickens" (1870); and "Sir Walter Scott: the Story of his Life" (Boston, 1871).

**MACKENZIE, William Lyon**, a Canadian politician, born in Dundee, Scotland, March 12, 1795, died in Toronto, Canada, Aug. 28, 1861. He received a good English education, and commenced business at the age of 17 by keeping a circulating library in Ayleth, near his native town. Subsequently he went to England, and became a clerk in the employment of Lord Lonsdale. In 1820 he emigrated to Canada, and was made superintendent of the works of the Lachine canal, and afterward opened a drug and book store in Toronto. He entered political life about 1824, and from that time till 1833 edited the "Colonial Advocate," an opposition journal published at Niagara. In 1828 he was returned to the provincial parliament; but, for alleged libel upon the assembly, was expelled five times, only to be as often reelected, until the government at last refused to issue another writ of election. In 1832 he went to England with a petition of grievances from the reformers of Canada. In 1836 he was the first mayor of Toronto; and in 1837 he abandoned his journal, "The Constitution," started some time previously, and, believing the provinces ripe for revolt, appeared on Yonge street, near Toronto, at the head of an armed force, and demanded of the lieutenant governor, Sir F. B. Head, a settlement of all provincial difficulties by a convention, which demand was not acceded to. He now determined to march on the city, secure a quantity of arms stored there, arrest the governor and the members of his cabinet, and declare Canada a republic; but the government was soon in the field with a superior hostile force. An encounter took place at Montgomery's hill, about 4 m. from the city, Dec. 7, 1837, when, after some skirmishing in which several lives were lost, the insurgents fled, and took up a position on Navy island in the Niagara river; whence



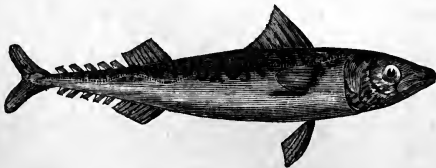
Mackenzie, who had been already outlawed, issued a proclamation offering \$100 and 300 acres of land to volunteers. Here he was joined by many American sympathizers; but owing to the exertions of Gen. Scott, the camp was broken up, and Mackenzie was taken prisoner and sentenced to 12 months' confinement in Rochester jail. On being set at liberty he found employment on the press of the United States, and was for five or six years a contributor to the New York "Tribune." During that period he published some political pamphlets, one of which was compiled from papers found in the custom house, where he held a clerkship for a short time. On the proclamation of amnesty in 1849 he returned to Canada, and was again speedily elected to parliament, where he sat till 1858. From his retirement almost up to the time of his death he published in Toronto "Mackenzie's Message," a weekly journal. Toward the close of his life his friends raised a sufficient sum to purchase for him an annuity and a homestead near the city.

**MACKENZIE RIVER**, a river of British North America, in the Northwest territories of Canada, which has its head in Great Slave lake, and, after a N. course of about 1,200 m., empties through several mouths into the Arctic ocean, in about lat. 69° N., lon. 135° W. It flows through beds of coal and lignite, and is navigable by steamers throughout, though the rapids below Great Bear river in times of low water might prove an obstacle. Its width, which is irregular, sometimes extends to two miles. The ice breaks up at Fort Simpson, one of the Hudson Bay company's posts, in lat. 61° 51', about the beginning or middle of May, and the river is open to its mouth about the end of that month. Floating ice generally prevents navigation even in the upper part of its course before the beginning of June. The chief tributaries of the Mackenzie are Mountain river or Rivière aux Liards from the west, and Great Bear river, the outlet of Great Bear lake, from the east. Mountain river rises beyond the Rocky mountains near the sources of the Yukon, and empties into the Mackenzie at Fort Simpson; it has a rapid current, and its navigation is dangerous.—The Mackenzie is but a part of a stream 2,500 m. in length, the upper portions of which bear different names. It rises as the Athabasca in the Rocky mountains, near the source of the Columbia, and, after an extremely rapid descent through a fertile and well wooded country, receiving the waters of Lesser Slave lake from the west, and a little further down successively those of Lac La Biche and the Clearwater or Little Athabasca river from the east, enters the S. W. extremity of Lake Athabasca. The portion between the affluent from Lac La Biche and the Clearwater river is called rivière à la Biche or Red Deer river. After leaving Lake Athabasca it is called first the Rock and then the Slave river, until it loses itself in Great Slave lake. The Hudson Bay company's boats

ascend with only two interruptions to Jasper House, more than 2,000 m. from the Arctic ocean. These interruptions are a group of rapids in rivière à la Biche, and another in Slave river. Just below Lake Athabasca the Peace river enters from the west. This stream, which is considered by some the source of the Mackenzie, rises in the Rocky mountains near the source of Fraser river, and flows through a beautiful and fertile valley; it is navigable by the Hudson Bay company's boats throughout nearly its entire course.—The Mackenzie river was discovered and first navigated in 1789 by Alexander Mackenzie, from whom it derives its name.

**MACKEREL**, a well known acanthopterygian fish of the scomberoid family, and one of great utility to man, from its countless numbers and excellence as food. This family includes also the bonito and its allied forms, the tunny, the pilot fish, and the sword fish. The scales are small, delicate, and smooth, the bones light, the tail slender, and gill covers unarmed; the first dorsal fin continuous, the rays of the second and of the anal detached, forming finlets, and with a large interval between the dorsals; the body is fusiform, the caudal fin powerful, the tail usually with a slight keel on the side, the vertical fins without scales; a row of small conical teeth in each jaw; branchiostegal rays seven; most of the species have no air bladder. The common European mackerel (*scomber scombrus*, Cuv.), so well known for the beauty and brilliancy of its colors and the elegance of its form, has a pointed nose, the under jaw the longer, the gill covers large and smooth, the pectorals and ventrals in advance of the dorsal, the former the most anterior, five finlets above and below the tail, vertically over each other, and the tail crescent-shaped; the color above the lateral line is fine green varied with blue, and marked with broad, descending, undulating, dark lines; the lower parts are silvery with golden tints. According to Anderson, the mackerel performs migrations almost as extensive as the herring; it probably inhabits almost every part of the European seas, and comes into shallow water at particular seasons to breed; were it not for these periodical visits, no effective fishery could be carried on, as it would be impracticable to follow the shoals over the ocean; great as is the number caught, it is very small compared with those which escape. It is caught on the shores of Great Britain from March to June, spawning in the latter month; the young, called shiners, are 6 in. long by the end of August; in winter they retire to deep water, though a few are taken on the Cornish coast all the year round; as many as 500,000 eggs have been counted in a single female. The mackerel is very voracious, feeding principally on the fry of other fish; it grows rapidly, and attains an average length of 15 in., and a weight of 2 lbs., though some considerably exceed this. It is considered better in May or June than earlier or later in the

season; the flesh rapidly becomes soft, and must be eaten soon after being taken from the water; much of the flavor, however, is retained in the salted fish. The mackerel season is a very busy and profitable one on the British coasts, a single boat's crew sometimes gaining £100 in a night's fishing. They are taken in large quantities by drift nets, reaching about 20 ft. below the surface, and extending for more than a mile; these are set in the evening, and the fish, roaming at night, are caught in the meshes and retained by the pectoral fins; they are caught also in seines and by trailing. The mackerel will bite at almost any bait, especially anything resembling a living prey, and will even dart at a piece of red cloth or leather; it generally takes the hook not far below the surface. The Spanish mackerel (*S. colias*, Gmel.), found abundantly in the Mediterranean, occasionally upon the French and English coasts, and perhaps even in American waters (though a different species from that commonly known here by that name), is about as large as the last, with larger scales, and with the dark undulations of the back more complicated and the whole surface more or less spotted with gray; it has an air bladder, which the common species has not; it is far inferior also as an article of food. Mackerel of these and many other species, described in ichthyological works, are found in all the northern seas from Greenland to the Mediterranean, in the Black sea and that of Azov, and in the waters of Australia, the East Indies, the Cape of Good Hope, the North Atlantic, and the American coasts; they have everywhere, and from remote antiquity, maintained a high rank as an article of food. Not only man, but many species of cetaceans and fish, prey upon the mackerel; among their greatest enemies in our waters are the horse mackerel or tunny and the blue fish. From the perishable nature of their flesh, it is permitted in many English seaports to cry them in the streets on Sundays.—The common mackerel of our coast is the *S. vernalis* (Mitch.), of a dark green color above, with beautiful undulations of a darker color extending below the lateral line; the top of the head is dark, almost black, and a large black blotch extends backward from the occiput to the gill covers; behind the eyes cu-



Common Mackerel (*Scomber vernalis*).

preous; gill covers silvery, sides white with cupreous reflections, and abdomen white; beneath the lateral line is a fuliginous line, often interrupted, extending the whole length of the

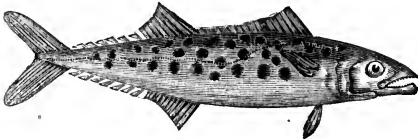
fish. The fins and finlets are much like those of the European species.—Mackerel fishing is carried on extensively in Massachusetts and Maine, the principal ports being Provincetown, Wellfleet, Harwich, Dennis, Cohasset, Boston, Salem, and Gloucester in the former state, and Portland, Southport, Boothbay, Camden, North Haven, and Deer Isle in the latter. The vessels employed are schooners of from 45 to 90 tons, averaging about 65 tons, and carrying an average of 15 men when the fish are taken with the seine, or 17 men when the hook and line are used. The seine, which is now used by most vessels except in the gulf of St. Lawrence, did not come into general use till 1873. The seines weigh about 2,000 lbs. each, and are 175 fathoms long by 24 fathoms in width or depth in the middle, the depth gradually diminishing to 11 fathoms at the ends. Corks are placed a few feet apart along the upper rope, while rings, through which a rope called the "purse line" passes, are attached to the lower. A boat about 30 ft. long, manned by 10 men, with 8 oars including the steering oar, is carried for casting the seine. Two dories, about 13 ft. in length, manned by one or two men each, are employed to assist the seine boat. The fish are usually seen in shoals just rippling the surface of the water, moving slowly in one direction, frequently to windward. In casting the seine the boat takes a position 15 or 20 yards to the left of the head of the shoal, the ends of the cork rope and purse line are given to the dory, and the seine is thrown out as the boat is rowed in a circuit to the right until the dory, which has been lying still, is reached again. Then the cork rope and purse line are taken by the boat, and the seine is drawn or "pursed" up, enclosing the fish. The vessel is next brought alongside, and the fish are taken from the seine in dip nets. The process of seining under favorable circumstances is simple and easy, but with high winds it becomes difficult or impossible. The fish sometimes when surrounded dive, and passing under the seine elude the fishermen; at other times they fail to shoal for days together. They may sometimes be kept on the surface until the seine is cast around them by throwing bait from the vessel. The experienced fisherman, when a choice is offered him, does not select the largest shoal, from 200 to 250 barrels being as many as can be taken care of at a time. An unsuccessful cast of the seine consumes about two hours. In the gulf of St. Lawrence, the habits of the mackerel being less favorable for seining and high winds being more prevalent in the latter part of the season, the old method of fishing with hook and line still prevails. When this method is employed, each man has a space or berth assigned him of about 30 inches on the starboard rail of the vessel, and is provided with four or six lines of about seven fathoms in length, with "jigs" made by running sufficient pewter on the shank of the hook to cause it to sink readily. The

jigs are baited with small pieces of the skin of the mackerel. When about to make a trial the vessel is hove to on the starboard tack, and thus lies drifting moderately to leeward. Bait is then thrown to entice the mackerel to the surface, or "raise" them as it is termed, and to keep them alongside. The bait consists chiefly of porgies, though clams are sometimes used, and is ground in a bait mill, and thrown from boxes hung over the side of the vessel. The average quantity of bait used during the season by each vessel is 80 barrels, though when the fish are taken with the seine not more than 25 barrels are required. If the mackerel are successfully raised and bite well, three hours suffice to secure 100 barrels. Vessels of the average size have capacity for 250 or 300 barrels, and usually prepare for a trip of four or five weeks.—The process of dressing mackerel consists of four distinct operations, splitting, gipping, ploughing, and salting. The splitter splits the fish at the rate of 1,500 per hour, the knife passing along the back from the head to the tail, leaving the back bone on the right side, and throws them into a tub. Two gippers stand at each tub, remove the gills and entrails, and pass the fish into a barrel, called the "wash" barrel, where they are allowed to soak. Subsequently they are taken out singly, laid on a board skin down, and a light stroke of the plough, which consists of a piece of knife blade or similar instrument, is given on each side of the fish from the head two thirds down to the tail. When the fish are taken rapidly, however, this operation (which is designed to give the fish an appearance of fatness) is sometimes postponed until after they are landed. The last operation, salting, is performed by laying the fish singly in a barrel and sprinkling a light handful of salt on each. They are then allowed to remain over night, when some of the pickle is drained off, and the barrels are filled, headed up, and stowed below. A little less than a bushel of salt is used for a barrel, and it requires five wash barrels to make four barrels of salted fish. After being landed the mackerel are assorted, inspected, and branded by a state officer appointed for the purpose, and repacked for market. The size and quality are denoted by the numbers 1, 2, 3, and 4. No. 1 mackerel must be 13 in. long; No. 2, 11 in. To rate as No. 1 or No. 2 they must also be fat and in good condition. When of inferior quality and 13 in. in length, they are branded as No. 3 large; between 10 and 13 in., No. 3. All other mackerel free from taint or damage are rated No. 4. The first cargoes landed are invariably poor, and usually of good size. As the season advances the mackerel improve in condition, and after the beginning of July they are usually fat enough to pack according to size. The method of employing the crew in general use is known as the "half-line lay." By this method the crew draw one half of the gross stock, out of which they pay the cook's

wages, one half of the bait bill, and one half of the expense of packing, realizing about 40 per cent. net. When the hook and line are used, the fish caught by each man are kept separate, and the voyage is settled individually. In the cases of seiners the voyage is simply divided into shares for the men and parts of shares for the boys. The manager or "boss" of the seine generally receives from \$50 to \$100 extra from the owners, who also pay the captain a commission (usually about 4 per cent.) on the gross stock. The price of mackerel in the market, particularly the better qualities, is subject to great fluctuations. The average earnings of a fisherman employed through the season may be stated at \$300. The season begins about the first of April, and the fleet gradually increases until July, the greatest number of vessels being employed from that time to the early part of November, when the season closes. The early fleet, from 25 to 50 sail, first find the mackerel as far S. as Cape Henry and about 50 m. from land. For the first two months they ice the fish as soon as caught, and bring them fresh to the New York market; after that they carry salt and barrels and cure the fish. As the season advances the mackerel move N., the distance from the shore varying with the wind, being less with a W. than an E. wind; and from about the first of May to the latter part of June they are found from Cape May to Gay Head. About the first of July they move E. around the S. side of Nantucket, and from then until September they may be caught anywhere from that island to Cape Sable. During July and August many of the vessels cruise on George's bank; after the first of September the fleet is scattered from the Maine coast around the shore to Chatham, the last catch being usually off that port. A small fleet of "market boats," from 30 to 50 tons each, from Boston, Swampscott, and Duxbury, supply the Boston market with fresh fish, making their first trip about the middle of May, when mackerel first appear in Boston bay, and continuing until the last of November. In June a number of vessels, principally from Gloucester, Maine, and Nova Scotia, proceed to the gulf of St. Lawrence, and pursue the fishery chiefly around the shores of Prince Edward island and the Magdalen islands. This fleet increases during July and August, and is largest from that time until the last of October, when the season closes. The importance of the gulf fishery in comparison with the shore fishery, as that along the Atlantic coast is termed, has recently diminished. The number of barrels of mackerel inspected in the United States in 1873 was as follows:

STATE.	No. 1.	No. 2.	No. 3.	No. 4.	Aggregate.
Maine.....	12,770	6,845	2,579	.....	22,194
New Hampshire.....	.....	.....	.....	.....	2,548
Massachusetts.....	88,688	68,889	87,795	866½	165,788½
Total.....	96,458	70,734	40,874	866½	210,458½

There were 1,261 barrels reinspected in Maine and 37,388 in Massachusetts; total, 38,649. The Canadian catch for the year ending June 30, 1873, was 150,404 barrels, viz.: Quebec, 6,170; New Brunswick, 3,229; Nova Scotia, 141,005; besides 31,892 cans of preserved fish. (See FISHERIES.)—The fish called Spanish mackerel on our coast, *S. Dekayi* (Storer), much resembles the European *S. colias* (Gmel.), but is more robust, with more numerous spots, and with an interrupted dull brown band beneath the lateral line, extending from beneath the pectorals in a straight line to the tail. It is far less common than the *S. vernalis*; it is generally fat, and is regarded by epicures as a superior fish for the table. Another scomberoid, belonging to the genus *Cybum* of Cuvier (*C. maculatum*, Cuv.), is also called the Spanish or spotted mackerel; the body is elongated, but without the pectoral corslet of the tunny; there is an elevated crest on each side of the tail, and a smaller one above and below it; the teeth are large, compressed, and sharp, short, and even on the palate bones. The length is about 20 in.; the color above is dark leaden, lighter on the sides; the jaws, gill covers, and abdomen clear white, with a satin lustre; the dorsal ridge dark green; 20 or more



Spotted Mackerel (*Cybum maculatum*).

circular or oblong spots on the sides above and below the lateral line, most of them above the line and anterior to the second dorsal; the membrane of the first dorsal black, the second leaden, pectorals black below and light above, and the ventrals white; the rays of the first dorsal project beyond the membrane; the second dorsal is triangular, emarginated behind; there are eight or nine finlets between the caudal and the second dorsal and the anal. It extends from South America as far as the coast of Maine, and is esteemed as food.

**MACKEY, Albert Gallatin**, an American author, born in Charleston, S. C., in 1807. He graduated at the medical college of South Carolina in 1832, where he became demonstrator of anatomy in 1838. In 1844 he abandoned his profession, and divided his time between miscellaneous writing and freemasonry. He was connected with several periodicals at Charleston. In 1850 he established a masonic monthly, which was maintained almost solely by his own pen for three years, and in 1858 a "Quarterly," devoted to the same interests, which he continued for two years. He acquired almost unaided the Greek, Latin, Hebrew, and most of the continental languages. He has published a "Lexicon of Freemasonry" (Charles-

ton, 1845); "The Mystic Tie" (1849); "Principles of Masonic Law" (New York, 1856); "Book of the Chapter" (1858); "Text Book of Masonic Jurisprudence" (1859); "Cryptic Masonry," and "Masonic Ritualist" (1867); "Symbolism of Freemasonry" (1868); and "Manual of the Lodge" (1870).

**MACKIE, John Milton**, an American author, born in Wareham, Mass., in 1813. He graduated in 1832 at Brown university, where he was tutor from 1834 to 1838, and subsequently travelled in Europe. He has published a "Life of Godfrey William von Leibnitz" (1845), "Life of Samuel Gorton" (in Sparks's "American Biography," 1848); "Cosas de España, or Going to Madrid *via* Barcelona" (1848); a "Life of Schamyl, the Circassian Chief" (1856); "Life of Tai-Ping-Wang, Chief of the Chinese Insurrection" (1857); "From Cape Cod to Dixie" (1864); and contributions to the "North American Review," mostly relating to German literature and history.

**MACKINAW**, an E. county of the upper peninsula of Michigan, bordering on Lake Michigan and the straits of Mackinaw; area, about 1,250 sq. m.; pop. in 1870, 1,716. The surface is uneven and is well wooded. Timber is the principal article of export. Capital, Mackinaw.

**MACKINAW** (also called MACKINAC, and formerly MICHILMACKINAC), a village and the county seat of Mackinaw co., Michigan, situated on an island of the same name in the strait of Mackinaw, which connects Lakes Michigan and Huron, 215 m. N. of Lansing, and 260 m. N. N. W. of Detroit; pop. about 800. Mackinaw island is about 3 m. long and 2 m. broad. It is rough and rocky, and produces little except oats and potatoes. The village has a considerable trade in fish, but derives its chief importance from being a fashionable place of summer resort, and the seat of Fort Mackinaw, a United States military post. The fort is situated on a rocky eminence 150 ft. high, overlooking the village and commanding the strait. The village contains four hotels, several stores, and one or two churches.

**MACKINTOSH, Sir James**, a British author, born at Aldourie, near Inverness, Scotland, Oct. 24, 1765, died in London, May 30, 1832. His father, the proprietor of a small estate, the inheritance of his family for more than two centuries, served 24 years in the army. James was educated with great care by his mother, who lived with her mother and sisters, until at the age of 10 he was sent to school at Fortrose. He was regarded as a prodigy of learning, was employed at school to teach what he knew to the younger boys, and had become a prolific versifier when in 1780 he entered King's college, Aberdeen, where he remained till 1784, and then studied medicine at Edinburgh. Leaving the university in 1787, he arrived in London at a period of intense political excitement. He found debate in political clubs, the eloquence of Burke and Sheridan at the trial of Hastings, and the charms

of society, far more congenial to his tastes than the life of a medical practitioner. While his plans were thus undetermined, and he felt the pressure of pecuniary difficulties, he married a young lady without fortune, and found himself at the age of 24 with no prospect of professional settlement, with his property rapidly diminishing, and with a wife. The malady which attacked the king in 1788, and largely occupied the public attention, led him to advertise a work on insanity, a considerable portion of which was written, but which was never published. During the struggle concerning the regency he made his first public appearance in politics, the field then most congenial to his thoughts, by writing a pamphlet in support of Mr. Fox. In 1789 he made a tour with his wife through the Netherlands to Brussels, and on his return to London he contributed articles on the affairs of Belgium and France to the "Oracle" newspaper, which led to his superintendence of the foreign department of that journal. From this period dates his resolution to study law and change his profession. Burke's "Reflections on the French Revolution" was generally received with enthusiasm by the educated classes, and with indignation by those who favored the French principles of liberty. Numerous replies were immediately published, and in the *Vindicia Gallicæ* (April, 1791) Mackintosh appeared as the apostle of liberalism, with a beauty of style and illustration which placed him at once in the front rank of his party. His acquaintance was sought by the most eminent whigs of the day, and upon the formation of the association of the friends of the people he became its secretary, in which semi-official character he defended its principles in a letter to Pitt. He was called to the bar in 1795, and attached himself to the home circuit. But the technicalities of the law were distasteful to his generalizing and philosophical mind, and excursive reading and occasional contributions to periodicals divided his attention, when in 1797 he suffered a severe affliction in the loss of his wife. In 1799 he formed the plan of a series of lectures upon the law of nature and of nations, for which the benchers of Lincoln's Inn granted him the use of their hall. The reputation gained by his lectures favored his professional advancement, and for a few years he was chiefly occupied with legal practice. His forensic reputation was raised to its highest point by his effort as counsel for Peltier (Feb. 21, 1803), accused of libel on the first consul of France. "I perfectly approve of the verdict," wrote Erskine, "but the manner in which you opposed it I shall always consider as one of the most splendid monuments of genius, learning, and eloquence." By the friendly interest of Canning he obtained the recordership of Bombay, and was knighted. He reached India in May, 1804, and in 1806 received the additional appointment of judge of the admiralty court. At Bombay he founded

and was president of the literary society, for the investigation of the philosophy, arts, literature, geography, and history of India. He returned to England, poor and with broken health, in 1812. In 1813 he was returned to parliament in the whig interest for the county of Nairn, and retained his seat successively for Nairn and Knaresborough during the remainder of his life. In 1818 he was appointed professor of law in the college at Haileybury, and discharged the duties till 1824. Under Lord Grey's administration in 1830 he became a member of the board of control, though a seat in the cabinet was generally expected for him. His last great political effort was a speech advocating the reform bill (July 4, 1831). While in India he planned a history of England from the reign of James II., which was prosecuted from time to time, though ultimately he changed his scheme and wrote a brief but highly esteemed general survey of English history down to the reign of Elizabeth, forming three volumes of Lardner's "Cabinet Cyclopædia;" a new edition in 2 vols., revised by his son, was published in 1853; the work has also been continued to 1760 by Wallace and Bell (10 vols., London, 1830-'38). Of his larger work only a fragment was posthumously published, containing an account of the revolution of 1688, which Macaulay pronounced decidedly the best history of the reign of James II. Among his works originally written for Lardner's "Cyclopædia," and afterward published separately, is a "Life of Sir Thomas More" (London, 1844). For the "Encyclopædia Britannica" he wrote an introductory "Dissertation on the Progress of Ethical Philosophy;" the original outline of which his declining health obliged him to compress. His miscellaneous works, including his contributions to the "Edinburgh Review," have been collected (3 vols., London, 1846; 1 vol., Philadelphia). The "Memoirs" of his life by his son (2 vols., London, 1835; Boston, 1853) includes also his autobiography, journal correspondence, and many fragments and sketches.

**MACK VON LEIBERICH, Karl**, baron, an Austrian general, born at Neuslingen, Franconia, Aug. 25, 1752, died at St. Pölten, near Vienna, Oct. 22, 1828. He rose from humble life, served in Turkey under Laudon, and against France in the Netherlands in 1792-'3. Appointed in 1798 generalissimo of the Neapolitan troops, he was defeated by Macdonald and Championnet, and incurring the suspicion of the French generals, by whom he was sent as prisoner to Paris, but made his escape and held command in Tyrol, Dalmatia, and Italy in 1804, and in S. W. Germany in 1805. Surrounded by Napoleon's armies, he surrendered the fortress of Ulm (Oct. 20, 1805) with a garrison of about 23,000 men, among whom were 18 general officers, with 40 stands of colors and 60 pieces of artillery. The spectacle of the triumph of the French at Ulm had a powerful



influence on the subsequent undertakings during the war. Mack was sentenced to death by an Austrian court martial; but his sentence was commuted, and he was cashiered and condemned to 20 years' imprisonment. He was set free after two years' detention, but was not pardoned till 1819.

**MACKLIN, Charles**, an Irish actor, born in Westmeath about 1690, died in London, July 11, 1797. His real name was McLaughlin. At the age of 14 he was apprenticed to a saddler, and soon ran away to England, where he married the widow of a publican. This marriage was speedily dissolved on account of his youth, and Macklin, returning to Ireland, became badgeman in Trinity college, Dublin. In 1711 he again visited England, and joined a strolling company of players in the capacity of harlequin. In 1725 he made his appearance at the Lincoln's Inn theatre, London, as Alexander in "Œdipus." In 1735 he accidentally killed a fellow actor in a quarrel, for which he was tried and found guilty of manslaughter. He was however acting in 1741, when he established his fame by his representation of Shylock at Drury Lane theatre. Retiring from the stage in 1753, he turned tavern-keeper and lecturer on oratory in Covent Garden. He lectured in full dress, and was laughed at by the wits of the day; and this speculation having failed, he returned to the stage in 1758, where he continued with some intervals till 1789, when, in his 100th year, the failure of his powers finally compelled him to abandon it for ever. There is some doubt as to the date of his birth, he himself, to serve a special purpose, as was alleged, placing it in 1699, contrary to the evidence of his contemporaries; but even in that case he presents an extraordinary instance of professional longevity. He was the author of ten dramas, two of which are still occasionally represented, "The Man of the World" and "Love à la Mode." A memoir of him, by J. T. Kirkman, was published in London in 1799.

**MACKNIGHT, James**, a Scottish author, born at Irvine, Argyshire, in 1721, died in Edinburgh in 1800. He studied at Glasgow and Leyden, was licensed as a preacher, and in 1753 was appointed minister of Maybole in Ayrshire, where he continued for 16 years, and composed some of his most valuable works. In 1769 he was transferred to Jedburgh, and in 1772 became pastor of one of the leading churches of Edinburgh, where the rest of his life was passed. His most important works are: "Harmony of the Four Gospels" (4to, 1756; 2d ed., 2 vols. 4to, 1763); "The Truth of the Gospel History" (4to, 1763); and "A New Translation of the Apostolical Epistles, with Commentary and Notes" (4 vols., 1795).

**McLANE, Louis**, an American statesman, born at Smyrna, Kent co., Del., May 28, 1786, died in Baltimore, Oct. 7, 1857. He was the son of Allen McLane, a distinguished revolutionary officer. He entered the navy in 1798,

and served as a midshipman in the Philadelphia under the elder Decatur; but he afterward studied law, and was admitted to the bar in 1808. During the war with England he served as a volunteer in a company which marched to the defence of Baltimore in 1814. He was representative in congress from the state of Delaware from 1817 to 1827, when he was chosen senator. In May, 1829, he was appointed by President Jackson minister to Great Britain, which post he held for two years, and on his return home was made secretary of the treasury. In 1833 he declined to sanction the removal of the deposits from the United States bank, and was consequently transferred by the president to the state department. He held the office of secretary of state till June, 1834, when he resigned and retired from political life. In 1837 he accepted the presidency of the Baltimore and Ohio railroad, which he held till 1847. In June, 1845, he was appointed by President Polk ambassador to London during the pendency of the Oregon negotiations, after the settlement of which he resigned. In 1850 he was a member of the convention to reform the constitution of Maryland, which was his last public service. While in congress he voted against the admission of slavery into the territories, although his course was in opposition to the views of his constituents.

**MACLAURIN, Colin**, a Scottish mathematician, born at Kilmodan, Argyshire, in February, 1698, died in Edinburgh, June 14, 1746. He was educated at the university of Glasgow, and in 1717 was appointed professor of mathematics in Marischal college, Aberdeen, which post he occupied till 1725, when, at the recommendation of Sir Isaac Newton, whose acquaintance he had formed during a visit to London in 1719, he was called to be assistant professor of mathematics at Edinburgh, and after the death of Prof. Gregory succeeded him and retained the mathematical chair until his death. During the rebellion of 1745 he sided with the existing government. Upon the entrance of Charles Edward into the city he took refuge with Dr. Herring, archbishop of York, but returned to Edinburgh when quiet was restored. His works are: *Geometria Organica* (London, 1720); "Treatise on the Percussion of Bodies," an essay for which he received the prize of the academy of sciences in 1724; a "Treatise on Fluxions" (2 vols. 4to, Edinburgh, 1742), written partly in reply to an attack of Bishop Berkeley on the principles of fluxions; a "Treatise on Algebra" (1748); and an "Account of Sir Isaac Newton's Philosophical Discoveries" (London, 1748), left unfinished and published from his papers.

**McLEAN.** I. A N. W. county of Kentucky, intersected by Green river; area, 320 sq. m.; pop. in 1870, 7,614, of whom 814 were colored. The surface is undulating and the soil productive. It is traversed by the Owensboro and Russellville railroad. The chief productions in

1870 were 26,984 bushels of wheat, 271,508 of Indian corn, 50,506 of oats, 2,262,037 lbs. of tobacco, 17,580 of wool, and 61,665 of butter. There were 1,919 horses, 481 mules and asses, 1,533 milch cows, 3,148 other cattle, 7,347 sheep, and 14,528 swine; 2 flour mills, and 3 saw mills. Capital, Calhoun. **II.** A central county of Illinois, drained by tributaries of the Illinois river; area, 1,132 sq. m.; pop. in 1870, 53,988. Much of the surface is prairie, and the soil is very fertile. It is traversed by the Illinois Central and other railroads. The chief productions in 1870 were 212,756 bushels of wheat, 39,824 of rye, 3,723,379 of Indian corn, 911,127 of oats, 36,072 of barley, 219,558 of potatoes, 116,738 lbs. of wool, 887,578 of butter, and 71,742 tons of hay. There were 19,943 horses, 11,663 milch cows, 27,202 other cattle, 25,232 sheep, and 62,007 swine; 5 manufactories of agricultural implements, 5 of brick, 20 of carriages, 1 of cars, 4 of iron castings, 4 of machinery, 11 of saddlery and harness, 2 of sash, doors, and blinds, 13 of tin, copper, and sheet-iron ware, 1 of woollen goods, 1 distillery, 3 breweries, and 13 flour mills. Capital, Bloomington.

**McLEAN, John**, an American jurist, born in Morris co., N. J., March 11, 1785, died in Cincinnati, April 4, 1861. In 1789 his father, a poor man with a large family, removed to Morganstown, Va., thence to a place near Nicholasville, Ky., and finally in 1799 to what is now Warren co., Ohio. Here the son labored on the farm until 16 years of age. In 1803 he went to Cincinnati to study law, and in 1807 was admitted to the bar and commenced practice at Lebanon, Warren co., O. He represented his district, which then included Cincinnati, in congress from 1813 to 1816, being unanimously reelected in 1814. He supported the Madison administration, originated the law to indemnify individuals for property lost in the public service, and introduced an inquiry as to pensioning the widows of fallen officers and soldiers. He was a judge of the supreme court of Ohio from 1816 to 1822, when he was appointed by President Monroe commissioner of the general land office. In July, 1823, he was appointed postmaster general. The post office department was then in a very disordered and inefficient condition, but it was restored to order and efficiency under his administration. By a nearly unanimous vote of the senate and house the postmaster general's salary was raised from \$4,000 to \$6,000 a year. In 1829, having declined the war and navy departments, which were offered to him by President Jackson, he resigned the office of postmaster general and was appointed associate justice of the supreme court of the United States. In this capacity his charges to grand juries while on circuit are distinguished for ability and eloquence. One of the most noted of these was delivered in December, 1838, in regard to aiding or favoring unlawful military combinations by our cit-

izens against any foreign government or people with whom we are at peace, with special reference to the Canadian insurrection and its American abettors. In the Dred Scott case (1857) he dissented from the decision of the court as given by Chief Justice Taney, and expressed the opinion that slavery had its origin merely in power, and was against right, and in this country sustained only by local law. His name was before the free-soil convention at Buffalo in 1848 as a candidate for nomination as president, and in the republican national convention at Philadelphia in 1856 he received 196 votes for the same office to 359 for Col. Fremont. In the republican convention at Chicago in 1860 he also received a number of votes. He was the author of several volumes of "Reports of the United States Circuit Court," and several published addresses.

**McLENNAN**, a central county of Texas, intersected by the Brazos river; area, 960 sq. m.; pop. in 1870, 13,500, of whom 4,627 were colored. Its surface is undulating, the river and creek bottoms well timbered, oak, cedar, and elm being abundant, and the soil of the bottoms and the prairie exceedingly fertile. A branch of the Houston and Texas Central railroad terminates at the county seat. The chief productions in 1870 were 11,711 bushels of wheat, 502,500 of Indian corn, 10,753 of oats, 21,280 of sweet potatoes, and 8,829 bales of cotton. There were 7,506 horses, 3,774 milch cows, 21,988 other cattle, 7,129 sheep, and 14,471 swine. Capital, Waco.

**McLEOD**, a S. central county of Minnesota, watered by the S. fork of Crow river; area, 504 sq. m.; pop. in 1870, 5,643. The surface is undulating and the soil productive. It is traversed by the Hastings and Dakota railroad. The chief productions in 1870 were 149,451 bushels of wheat, 48,381 of Indian corn, 96,487 of oats, 10,914 of barley, 31,855 of potatoes, 11,470 lbs. of wool, 168,438 of butter, and 16,932 tons of hay. There were 1,102 horses, 2,483 milch cows, 4,141 other cattle, 3,489 sheep, and 2,492 swine; 1 flour mill, and 2 saw mills. Capital, Glencoe.

**McLEOD. I. Alexander**, an American clergyman, born in the island of Mull, Scotland, June 12, 1774, died in New York, Feb. 17, 1833. Emigrating to the United States in 1792, he joined the Reformed Presbyterian church, entered Union college, and graduated in 1798. In 1799 he was licensed as a preacher, and two years afterward was ordained and installed in the charge of the first Reformed church in New York, and of one in Walkkill, Orange co., N. Y. The latter he soon after resigned; but his connection with the New York congregation lasted till his death. He was an assistant editor of the "Christian Magazine." His principal works are: "Negro Slavery Unjustifiable" (New York, 1802; new ed., 1860); "Ecclesiastical Catechism" (1807); "Lectures upon the Principal Prophecies of the Revelation" (1814); "View of the late War"

(1815); "The Life and Power of True Godliness" (1816); and "The American Christian Expositor" (2 vols., 1832-3). See "Memoir of Alexander McLeod, D. D.," by Samuel B. Wiley, D. D. (8vo, New York, 1855). **II. Xavier Donald**, an American author, son of the preceding, born in New York, Nov. 17, 1821, killed in a railway accident near Cincinnati, July 20, 1865. He graduated at Columbia college, and after studying theology took orders in the Episcopal church in 1845. He was settled for a short time in a rural parish, and in 1850 went to Europe, where he travelled and studied till 1852. During his residence abroad he became a Roman Catholic, and after his return devoted himself to literary pursuits, contributing to various magazines, and publishing "Pynnshurst, his Wanderings and Ways of Thinking" (New York, 1852); "Life of Sir Walter Scott" (1852); "The Bloodstone" (1853); and "Life of Mary, Queen of Scots" (1857). He also wrote "The Elder's House, or the Three Converts;" "Château Lescure, or the Last Marquis;" and a "Life of Fernando Wood," mayor of New York (1856). His fugitive poems are his most characteristic productions; some of them, as "The Weeder" and "The Saga of Viking Torquil," have great merit. In 1857 he became professor of rhetoric and belles-lettres at Mount St. Mary's (Roman Catholic) college near Cincinnati, and was ordained a priest.

**MACLEOD, Henry Dunning**, a Scottish economist, born in Edinburgh in 1821. He was educated in Edinburgh, Eton, and Cambridge, and was called to the bar in London in 1849. He has effected reforms in the poor laws of Scotland, and published "Theory and Practice of Banking" (London, 1856), "Elements of Political Economy" (1858), and "Dictionary of Political Economy (1859 *et seq.*). From 1868 to 1870 he was engaged in preparing for the government a codification of English laws and a digest of laws relating to bills of exchange. His inductive theories of political economy gave rise to Richelot's *Une révolution en économie politique* (Paris, 1863).

**MACLEOD, Norman**, a Scottish clergyman, born near Edinburgh, June 3, 1812, died in Glasgow, June 16, 1872. He studied at Edinburgh, Glasgow, and in Germany, and in 1838 became minister at Loudoun, Ayrshire, in 1843 at Dalkeith, near Edinburgh, and in 1851 at St. Columba's kirk, or the Barony parish, Glasgow. He was one of the royal chaplains, preaching at Balmoral during the queen's residence there. One of his sermons was published at her request, and widely circulated. In 1850 he made a tour through Canada, and in 1867 through India, to promote the missionary work of the kirk of Scotland. From 1850 to 1860 he was editor of the "Edinburgh Christian Magazine," and from 1860 to his death of "Good Words." His principal publications are: "The Earnest Student: Memorials of Mackintosh" (1847); "Reminiscences of a High-

land Parish" (1862); "The Old Lieutenant and his Son" (2 vols., 1862); "Eastward" (1866); "The Starling, a Scottish Story" (1867); and "Peeps at the Far East" (1871).

**MACLISE, Daniel**, a British painter, born in Cork, Ireland, Jan. 25, 1811, died in London, April 26, 1870. He was placed in a banking house, but at the age of 16 went to London, and became a student in the royal academy, where he won all the prizes for which he was a competitor. He studied during the summer of 1830 in Paris, and for the next two years made drawings for books and periodicals, and painted portraits. In 1833 he exhibited at the British institution his "Mokanna Unveiling," "All Hallow Eve," and "A Love Adventure of Francis I." The success of these enabled him to abandon portrait painting. In 1835 he exhibited "The Chivalrous Vow of the Ladies and the Peacock," and was elected an associate of the royal academy, of which in 1841 he was chosen a member. His paintings are numerous, his favorite subjects being Irish and English incidents in the days of chivalry, and scenes from Shakespeare and the Italian poets. Among his principal works are: "The Play Scene in Hamlet," "The Return of the Knight," and "The Origin of the Harp" (1842); "The Actor's Reception of the Author" (1843); "The Lady Released from the Enchanted Chair" (1844); "The Seven Ages" and "The Sacrifice of Noah" (1847); "The Spirit of Chivalry" and "The Spirit of Justice," frescoes for the house of lords; "The Marriage of Strongbow and Eva" (1854); and a set of 42 drawings illustrative of the Norman conquest (1856). For some years previous to his death he was occupied in preparing a series of cartoons to be executed in fresco for the houses of parliament. Among the subjects are "The Death of Nelson" and "The Meeting of Blücher and Wellington after the battle of Waterloo," both of which have been engraved for the art union, and a painting from the latter was exhibited in 1866. In that year he declined the presidency of the royal academy.

**MACLURE, William**, an American geologist, born in Ayr, Scotland, in 1763, died at San Angel, near the city of Mexico, March 23, 1840. At 19 years of age he visited New York, but returned to London to become a partner in the commercial house of Miller, Hart, and co., in which he rapidly acquired a fortune. In 1796 he settled in the United States, and in 1803 was in Europe as one of the commissioners to settle the claims of American citizens against France for spoiliations during the revolution in that country. While on the continent he travelled extensively, examining the geology of Europe, and collecting objects in natural history. On returning, he engaged with zeal in the extraordinary private undertaking of a geological survey of the whole country. He visited almost every state and territory, crossing and recrossing the Alleghanies no fewer than 50 times.

His first communication to the public was a memoir entitled "Observations on the Geology of the United States, explanatory of a Geological Map," read before the American philosophical society, Jan. 20, 1809, and published in vol. vi. of their "Transactions." On May 16, 1817, he presented another memoir to the society, which was published in their "Transactions," and also in a separate volume with a colored map and sections. The former publication was six years prior to William Smith's improved geological map of England, a production which gave its author the title of father of English geology. To Maclure is equally due the title of father of American geology. His map presented the general range of the secondary, transition, and primitive rocks, as they were then called, with considerable accuracy; but the tertiary groups, the arranging of which really involved an acquaintance with their fossils, were very imperfectly defined. He took up his residence in Philadelphia, and joined the academy of natural sciences in that city, whose library and museum were made the recipients of his books and specimens, forming a collection then unique in the United States. From 1817 till his death he was president of the academy, and its "Journal" was commenced under his auspices. In 1816-'17 he examined the geology of the Antilles, an account of which was published in vol. i. of the "Journal." In 1819 he visited France, and then went to Spain to establish a great agricultural school for the lower classes, in which labor should be combined with moral and intellectual culture. He purchased from the revolutionary government 10,000 acres of land near Alicante; but when his buildings were completed, the government was overthrown, and his property reverted to the church from which it had been confiscated. After a hazardous geological tour in southern Spain, he returned in 1824 to the United States. Here he attempted to establish a similar agricultural school, and removed to the New Harmony settlement in Indiana, though not adopting the peculiar views of that community. Several distinguished naturalists joined him in this enterprise. The scheme failed, but Mr. Maclure, having purchased largely of land in and around New Harmony, remained there several years in the hope of bringing his school into operation. His health failing in 1827, he embarked for Mexico, returning the next summer; but after attending the meeting of the American geological society in New Haven, Nov. 17, 1828, as the presiding officer, he again went to Mexico. In 1834 he gave directions for the removal of his library of 2,259 volumes, with many maps and charts, from New Harmony to the academy of natural sciences; and he gave to that institution in all \$20,000 to secure a suitable building for its books and collections. The American geological society at New Haven also received from him many very valuable

works and specimens. Early in 1840 Maclure attempted a journey to the United States, but was obliged to return, and died on the way. While in Mexico he wrote "Opinions on Various Subjects," devoted mainly to political economy (2 vols. 8vo, New Harmony, 1837).

**MacMAHON, Marie Edme Patrice Maurice**, count de, and duke de Magenta, president of France, born at the château of Sully, near Autun, in 1808. His Irish ancestors had settled in Burgundy after the downfall of the Stuarts, and intermarried with illustrious French families. His father, the marquis Charles Laure de MacMahon, a general and peer of France, and a personal friend of Charles X., married Mlle. de Caraman, a lady of high rank, who bore him four daughters and four sons, of whom the president is the youngest. His elder brother Joseph, like the rest of the family an ardent legitimist, retired from public life after the overthrow of Charles X., and died in 1865. MacMahon studied at the seminary of Autun, in a school at Versailles, and at the military academy of St. Cyr, which he left in 1827 with the grade of sub-lieutenant. In 1830 he served in Algeria, and in 1832 he was aide-de-camp of Gen. Achard during the siege of Antwerp. He returned to Africa in 1833 with the commission of captain, and was severely wounded at the siege of Constantine in October, 1837. He was then rapidly promoted, and in 1852 he became general of division, and afterward chief commander of the military division of Constantine. He went to the Crimea in August, 1855, as commander of a division, and the capture of the Malakhoff in the following month was mainly due to his energy. At the close of the war he took his seat in the senate, of which he had been made a member. In 1857 he again went to Africa and cooperated with Gen. Randon in the successful Kabyle expedition, after which he was placed at the head of the Algerian land and naval forces. Shortly before the outbreak of the war in Italy he attracted attention in the senate by his opposition to the restrictive measures proposed in regard to public safety. At the commencement of the campaign of 1859 he commanded the second corps, and was the first to cross the Ticino near Turbigo (June 3), arresting an Austrian column in its march on Robecchetto. On June 4 he decided the brilliant victory at Magenta, for which the emperor made him duke of Magenta and marshal. On Oct. 18, 1861, the marshal officially attended, with considerable display of magnificence, the coronation of William I. of Prussia (now emperor of Germany). From October, 1862, to September, 1864, he was stationed at Lille and Nancy as military commander, and subsequently he was governor general of Algeria. His attempted conversion of the colonial administration into a purely military viceroyalty proved a complete failure; and the trouble was complicated by a famine, by MacMahon's opposition to the resident archbishop's propaganda among the natives, and by a rising in 1869 of fanati-

cal tribes. This was speedily put down, and a more conciliatory policy was adopted. MacMahon vindicated his course in the senate, Jan. 21, 1870, and repeatedly offered his resignation, which was not accepted. At the outset of the Franco-German war, in July, 1870, he was posted near Strasburg, in command of the first corps. A division under Gen. Abel Douay, which formed his advance guard, rashly exposed itself to an attack by the Germans near Weissenburg, and met with a disastrous defeat, which was the first French reverse (Aug. 4). To retrieve this loss MacMahon advanced, and took up his position at Wörth. Its main points were speedily carried by the overwhelming forces under the Prussian crown prince, and MacMahon was utterly routed (Aug. 6), thousands of his troops and most of his artillery being captured, while the German cavalry pursued his almost panic-stricken detachments through the passes of the Vosges mountains. He rallied them with great difficulty, and retreated to Châlons. Here he was joined by the emperor, and the remnant of his soldiers, numbering barely 18,000, were reinforced to the extent of about 100,000. With this force he was ordered by Palikao to march to the relief of Bazaine at Metz, and to cooperate with that general's army. MacMahon is said to have been desirous of moving in the direction of Paris instead of Metz, and to have marched on only in obedience to imperative orders. He had not advanced far when one of his most important corps under Gen. Faily was surprised and defeated at Beaumont (Aug. 30), driven beyond the Meuse, and compelled to retreat toward Sedan, where MacMahon consequently massed his forces. The Germans opened the battle at dawn, Sept. 1, and at 7 A. M. MacMahon was disabled by a slight wound in the thigh. He resigned his command to Ducrot, who was at once superseded by Wimpffen. MacMahon took no personal part in the capitulation, though he assumed the whole responsibility for the march on Sedan, and the catastrophe which resulted from it, before the committee at Versailles (Sept. 4, 1871). During the trial of Bazaine in 1873, testimony was produced in regard to an alleged despatch of Bazaine to MacMahon, intended to arrest the progress of the latter toward the east; but he denied having received it. After the surrender he was allowed to remain on his parole in a Belgian village for the recovery of his health, and subsequently in Wiesbaden, until the preliminary treaty of peace in February, 1871. Early in April he was appointed by Thiers commander-in-chief of the Versailles troops operating against the commune of Paris. After his final victory over the latter (May 28) he remained in command in the capital till July 1, when Ladmirault succeeded him as governor of Paris. He declined to be a candidate for the national assembly at the supplementary election of July 2. In January, 1872, when Thiers proposed to resign, MacMahon called

upon him, in behalf of the army, to remain in office. On the retirement of Thiers in consequence of an adverse vote in the assembly, May 24, 1873, the presidency was offered to MacMahon. At first he hesitated to accept it, and reminded Thiers that he had repeatedly, in the course of their frequent and amicable intercourse, volunteered the pledge that he would never supersede him. Thiers intimated that he had never accepted such a pledge; and finally, when Buffet, president of the assembly, appealed to the marshal's patriotism, he yielded, and before night sent to the assembly a formal letter of acceptance. The duke de Broglie was made prime minister. The first presidential message (May 26) declared that "the government was resolutely conservative and determined to defend society against all factions," and closed with the words: "The post in which you have placed me is that of a sentinel who has to watch over the integrity of your sovereign powers." The military and the legitimists speedily gained ground, however, receiving many offices. On the reopening of the assembly, Nov. 5, the president urged the adoption of measures for the greater stability of the government, and it was proposed by Changarnier, as chairman of a committee of nine appointed by the assembly for the regulation of the presidential term, to extend it to ten years. MacMahon on Nov. 17 rejected this conclusion, but declared his willingness to accept a seven years' prolongation of his powers; and a vote taken in the night of Nov. 19-20 reduced the term to seven years, known as the septennate. The defeat of the electoral bill on May 16, 1874, broke up De Broglie's cabinet, and the unavailing efforts of M. de Goulard and others to form a new administration intensified the crisis. MacMahon put an end to it on May 22 by the unexpected appointment of Gen. de Cissey as premier, and by selecting as his other ministers mostly monarchists and imperialists, all more or less obnoxious to zealous republicans. This anomalous condition of the executive branches was little calculated to allay the agitation in the assembly and the press, and MacMahon in vain demanded early in July a thorough and permanent organization of his authority. Another ministerial difficulty in the same month resulted in the substitution of Bodet for Magne as minister of finance, and of Chabaud de la Tour for Fourtoul in the interior. The repeatedly urged motion for the dissolution of the assembly was rejected on the same day (July 24), together with Casimir Périer's constitutional bill; but that body adjourned from Aug. 13 to Nov. 30, after appointing a permanent committee to sit during the recess.—The Bonapartists, legitimists, and Orleanists, each seeking to make MacMahon their instrument, soon became dissatisfied with him in proportion to the failure of their conflicting schemes. He is most distrusted by the liberals on account of his alleged ultramontaniam and its supposed influ-



ence on the delicate relations between Victor Emanuel and Pius IX., and generally on account of his life-long sympathy with monarchical forms of government, his undisguised predilection for a strongly conservative and military administration, and his rigorous treatment of the press and of popular manifestations. But in his official capacity he has so far shown a desire to respect the institutions as they temporarily exist under the authority of parliamentary laws, and in the midst of the turmoil of the assembly, the clash of rival factions, and the doubts in regard to the ultimate fate of the present political experiment, he has displayed both loyalty and alacrity in guarding the vital interests of the nation. His administration has witnessed the further recovery of the country from the effects of the war, the extinction of the indemnity to Germany, and the relief of the territory from the last remnants of German occupation (Sept. 16, 1873). MacMahon put an end to the danger of complications arising from the civil war waged by the Carlists, by recognizing Serrano as chief of the Spanish executive (Aug. 13, 1874) simultaneously with the cabinets of London and Berlin. Increasing armaments in Germany and the reorganization of the French army, joined to the spirit of animosity engendered by the war, continue to give to the relations with the German empire an abnormal character; but the president shows great reluctance to disturb the apparently peaceful relations of France with Germany and other nations.—Mme. MacMahon (born duchess de Castries) is noted for her charities and social tact, and for her intimate relations with the ultramontane clergy and the old nobility.

**McMINN**, a S. E. county of Tennessee, bordered on the S. W. by the Hiawassee river and drained by its tributaries; area, 475 sq. m.; pop. in 1870, 13,969, of whom 1,830 were colored. It has an undulating surface and fertile soil. It is intersected by the East Tennessee, Virginia, and Georgia railroad. The chief productions in 1870 were 43,925 bushels of wheat, 350,833 of Indian corn, 77,810 of oats, 13,102 of sweet potatoes, 17,858 lbs. of wool, 124,218 of butter, and 2,249 tons of hay. There were 2,336 horses, 2,653 milch cows, 4,423 other cattle, 9,829 sheep, and 16,552 swine. Capital, Athens.

**McMULLEN**, a S. county of Texas, watered by the Nueces, Rio Frio, and San Miguel rivers; area, 1,092 sq. m.; pop. in 1870, 230. In the river valleys the land is good and timber abounds. The upland is only adapted to pasturage. In 1870 the county contained 27,523 cattle and 5,030 sheep.

**McNAB**, Sir Alan Napier, a Canadian statesman, born at Niagara, Feb. 19, 1798, died in Toronto, Aug. 8, 1862. His grandfather was a royal forester of Scotland, and his father was lieutenant of dragoons and principal aide-de-camp to Gen. Simcoe during the revolution. In 1813 Alan became a midshipman on board Sir

James Yeo's ship, and accompanied the expedition to Sackett's Harbor and other American lake ports; but he soon abandoned the navy for the army, was present as ensign of the 100th regiment at the capture of Fort Niagara, and commanded the advanced guard at the battle of Plattsburgh. After the war he studied law, and practised in Hamilton, acting also as clerk of the journals in the assembly of Upper Canada. In 1829 he was elected a member of the assembly for the county of Wentworth, and after serving three terms was returned by the electors of Hamilton. He was subsequently chosen speaker of the lower house. During the insurrection of 1837-'8 he commanded the militia on the Niagara frontier, having the rank of colonel. He routed the insurgents near Toronto, Dec. 7, 1837. A portion of these, under W. L. Mackenzie, then took possession of Navy island in Niagara river, where they were joined by sympathizers from the American side, and commenced cannonading the Canadian village of Chippewa. Supplies were brought to them from the American side by the steamer Caroline. McNab sent over a body of men, who seized the Caroline in American waters, set fire to her, and sent her adrift over the falls of Niagara. This act, which gave rise to much angry feeling in the United States, was formally sanctioned by the British government. For his services during the insurrection McNab was knighted, July 14, 1838. After the union of the two provinces of Canada (1841) he became speaker of the legislature. He was prime minister under the governorship of the earl of Elgin, and for a short time under Sir Edmund Head, 1854-'6. He was made a baronet in 1858, and in 1860 a member of the legislative council.

**McNAIRY**, a S. W. county of Tennessee, drained by branches of the Big Hatchie river; area, 620 sq. m.; pop. in 1870, 12,726, of whom 1,500 were colored. The Mobile and Ohio railroad passes through it, and the Memphis and Charleston skirts the S. border. The chief productions in 1870 were 44,599 bushels of wheat, 370,431 of Indian corn, 18,362 of oats, 22,028 of sweet potatoes, 13,509 lbs. of wool, 110,865 of butter, and 3,347 bales of cotton. There were 2,338 horses, 1,149 mules and asses, 2,999 milch cows, 5,561 other cattle, 9,865 sheep, and 21,801 swine. Capital, Purdy.

**MACNEIL**, Hector, a Scottish poet, born at Rosebank, on the Esk, Oct. 22, 1746, died in Edinburgh, March 15, 1818. He served a mercantile apprenticeship in Glasgow and Bristol, and passed many years in the West and East Indies, and at sea in the capacity of admiral's secretary. He spent his last years in Edinburgh in affluence. He published in 1788 a statement concerning the treatment of negroes, and in 1789 his poem of "The Harp," founded on a legend of the Hebrides. During a residence near the field of Bannockburn he wrote in verse "Scotland's Skaith, or the History o' Will and Jean." His later writings include

"The Pastoral or Lyric Muse of Scotland" (1808); "Town Fashions" (1810); "Bygone Times and Late Come Changes" (1811); and "The Scottish Adventurers" (1812).

**McNEIL, John**, an American soldier, born at Hillsborough, N. H., in 1784, died in Washington, Feb. 23, 1850. In March, 1812, he was commissioned as captain in the 11th regiment of infantry, and in August, 1813, as major. At the battle of Chippewa (July 5, 1814) the bayonet charge of the 11th regiment under his command secured the victory to the Americans. For his conduct in this battle, and in that of Bridgewater, where he was severely wounded, he was successively brevetted as lieutenant colonel and colonel. He remained in the service after the peace, and attained the rank of brevet brigadier general (1824), and colonel of the first regiment of infantry (1826). He resigned his commission in 1830, having in 1829 been appointed surveyor of the port of Boston, a post which he held several years.

**McNEILE, Hugh**, an Irish clergyman, born at Ballycastle, county Antrim, about 1794. He graduated at Trinity college, Dublin, in 1815, and entered upon the study of law; but in 1820 he took orders, and for some time held a curacy in Donegal. He married a daughter of Archbishop Magee in 1822, became rector of Albury in Surrey, and during his incumbency preached frequently in London. In 1834 he became rector of St. Jude's church, Liverpool, and in 1848 of St. Paul's, Prince's park, built especially for him. He received the degree of D. D. from his college in 1845, and became honorary canon, and in 1860 canon residentiary, in Chester cathedral. His services in Liverpool were so highly esteemed that the citizens collected a large sum of money, and offered it to him as a testimonial; but the money was declined, and by his advice was devoted to the cause of education. In 1868 he was appointed by the queen dean of Ripon, which post he still occupies (1874). Dr. McNeile is one of the most successful and eloquent preachers in the church, and has published a number of volumes, among which are: "Miracles and Spiritual Gifts" (1832); "Sermons on the Second Advent of our Lord" (1835; 5th ed., 1842); "Lectures on the Prophecies relative to the Jews" (1840 and 1866); "Lectures on the Church of England" (8th ed., 1842); "The Church and the Churches" (1846; new ed., 2 vols., 1867); and "Letter to Dr. Pusey on his Eirenicon" (1866). He has also written tracts on Romanism, Unitarianism, &c.

**MacNEVEN, William James**, an Irish patriot, born at Ballynahowne, Galway, March 26, 1763, died in New York, July 12, 1841. He graduated M. D. at Vienna in 1784, and commenced the practice of physic in Dublin. Having taken part in the proceedings of the "United Irishmen," he was arrested March 12, 1798, confined in Kilmainham, and afterward in Fort George. He was liberated with the other prisoners in 1802, passed the summer and au-

tumn in travelling through Switzerland on foot, and wrote an account of his journey, entitled "A Ramble through Switzerland." In October he entered Paris, and a few months after joined the French army as a captain in the Irish brigade, hoping for an attack upon Ireland by the French. He was disappointed, resigned his commission, and set sail for New York, where he arrived on the 4th of July, 1804. He there entered upon the practice of medicine, received from Columbia college the honorary degree of M. D., and from 1808 to 1830 was professor in the college of physicians and surgeons and in a medical school connected with Rutgers college, N. J. He also published "Use and Construction of the Mine Auger" (London, 1788); "Exposition of the Atomic Theory" (1804); "Pieces of Irish History" (1807); and an edition of Brande's "Chemistry." He was co-editor for three years with Dr. De Witt of the New York "Medical and Philosophical Journal." In 1812 he was appointed resident physician by Gov. Clinton, and in 1840 by Gov. Seward.

**MACNISH, Robert**, a Scottish physician, born in Glasgow, Feb. 15, 1802, died there, Jan. 16, 1837. He studied medicine in Glasgow and Paris, and contributed to several Scottish magazines, especially to "Blackwood" under the title of "The Modern Pythagorean," a series of tales and sketches, which were issued separately in 1837. He also published "The Anatomy of Drunkenness" (1827), one of the first works in which the subject was discussed from a purely physiological standpoint; "The Philosophy of Sleep" (1830); a "Book of Aphorisms" (1833); and an "Introduction to Phrenology" (1835).

**MACOMB**, a S. E. county of Michigan, bordering on Lake St. Clair, and drained by Clinton river and its branches; area, 460 sq. m.; pop. in 1870, 27,616. In the east the surface is level and well timbered, and in the west hilly and broken; the soil is deep and fertile. The Grand Trunk and the Detroit and Bay City railroads pass through it. The chief productions in 1870 were 381,862 bushels of wheat, 317,358 of Indian corn, 529,417 of oats, 264,553 of potatoes, 144,806 lbs. of hops, 322,189 of wool, 888,184 of butter, and 42,689 tons of hay. There were 7,983 horses, 9,027 milch cows, 7,741 other cattle, 64,305 sheep, and 11,289 swine; 10 manufactories of agricultural implements, 18 of carriages and wagons, 12 of saddlery and harness, 4 of turned and carved wood, 21 saw mills, and 10 flour mills. Capital, Mount Clemens.

**MACOMB, Alexander**, an American soldier, born in Detroit, April 13, 1782, died in Washington, June 25, 1841. He entered the army in 1799 as a cornet of cavalry, was retained in the service after the partial disbanding of the army in 1802, and at the commencement of the war with Great Britain in 1812 held the rank of lieutenant colonel of engineers and adjutant general of the army. Finding his position not

likely to bring him into active service, he was transferred to the artillery, and in 1813, as colonel of the third regiment of artillery, distinguished himself at Niagara and Fort George. In January, 1814, he was promoted to be a brigadier general and placed in command of that part of the northern frontier bordering on Lake Champlain. At Plattsburgh on Sept. 11, 1814, being in command of about 1,500 regular troops and some detachments of militia, he sustained the attack of a greatly superior British force under Sir George Prevost, which, after the defeat of the British squadron on Lake Champlain on the same day, retreated to Canada. For his firmness and courage on this occasion, he was commissioned a major general, and received the thanks of congress and a gold medal. He was subsequently retained in the service as colonel of engineers, and after the decease of Maj. Gen. Brown in 1835 succeeded to the office of commander-in-chief of the army. He wrote a "Treatise on Martial Law and Courts Martial, as practised in the United States" (1809).—His son, WILLIAM H., born June 16, 1818, as lieutenant in the navy, captured the barrier forts at Canton, China, in 1856, commanded the Metacomet in the Paraguay expedition of 1859, and was in active service on the southern coast during the civil war. He became commander in 1862, captain in 1866, commodore in 1870, and died in Philadelphia, Aug. 12, 1872.

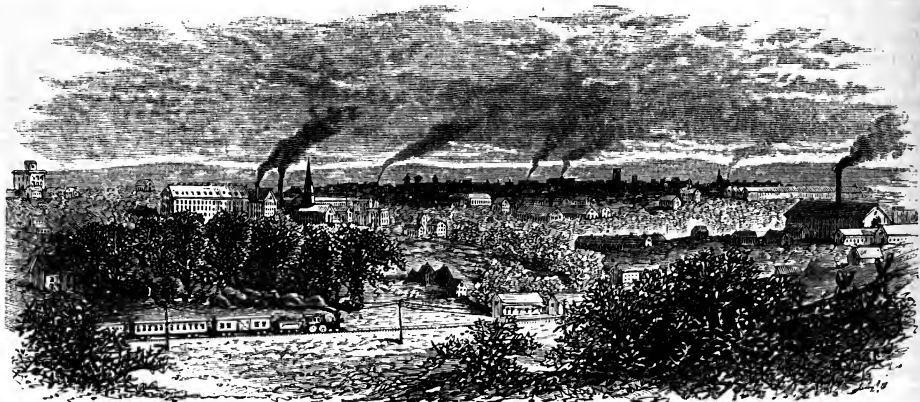
**MACON**, the name of six counties in the United States. **I.** A S. W. county of North Carolina, bordering on Georgia, and watered by the head streams of the Tennessee river; area, about 600 sq. m.; pop. in 1870, 6,615, of whom 403 were colored. On the S. E. border are the Blue Ridge mountains. It has an elevated surface and productive soil. The chief productions in 1870 were 21,365 bushels of wheat, 163,199 of Indian corn, 19,970 of oats, 10,837 of Irish and 10,225 of sweet potatoes, 26,739 lbs. of tobacco, 14,964 of wool, 64,601 of butter, and 1,007 tons of hay. There were 1,307 horses, 2,379 milch cows, 4,509 other cattle, 7,848 sheep, and 10,620 swine. Capital, Franklin. **II.** A S. W. county of Georgia, drained by Flint river and its tributaries; area, 353 sq. m.; pop. in 1870, 11,458, of whom 7,483 were colored. It has an undulating surface and fertile soil. The Southwestern railroad passes through it. The chief productions in 1870 were 4,330 bushels of wheat, 184,877 of Indian corn, 12,103 of peas and beans, 21,487 of sweet potatoes, 25,534 of butter, 2,994 of honey, 9,391 bales of cotton, and 7,261 gallons of cane molasses. There were 511 horses, 1,261 mules and asses, 1,288 milch cows, 2,482 other cattle, 1,147 sheep, and 3,205 swine. Capital, Lanier. **III.** An E. county of Alabama, drained by branches of the Tallapoosa river; area, about 700 sq. m.; pop. in 1870, 17,727, of whom 12,620 were colored. It has an undulating surface and productive soil. The Montgomery and West Point railroad traverses it.

The chief productions in 1870 were 2,429 bushels of wheat, 168,661 of Indian corn, 31,690 of oats, 20,755 of sweet potatoes, 1,745 lbs. of rice, and 11,872 bales of cotton. There were 872 horses, 1,653 mules and asses, 2,201 milch cows, 692 working oxen, 3,498 other cattle, 820 sheep, and 4,996 swine. Capital, Tuskegee. **IV.** A N. county of Tennessee, bordering on Kentucky, and drained by branches of the Big Barren and Cumberland rivers; area, 260 sq. m.; pop. in 1870, 6,633, of whom 791 were colored. The surface is uneven, and the soil generally fertile. The chief productions in 1870 were 30,525 bushels of wheat, 266,483 of Indian corn, 60,756 of oats, 9,441 of Irish and 9,340 of sweet potatoes, 950,768 lbs. of tobacco, 13,605 of wool, 82,924 of butter, and 1,988 bales of cotton. There were 2,233 horses, 1,599 milch cows, 2,696 other cattle, 8,175 sheep, and 13,227 swine. Capital, Lafayette. **V.** A central county of Illinois, intersected by the N. fork of the Sangamon river; area, 549 sq. m.; pop. in 1870, 26,481. It has a generally level surface and productive soil. The Illinois Central and the Toledo, Wabash, and Western railroads pass through it. The chief productions in 1870 were 251,852 bushels of wheat, 2,214,468 of Indian corn, 454,648 of oats, 117,959 of potatoes, 57,639 lbs. of wool, 159,426 of butter, and 19,963 tons of hay. There were 8,375 horses, 4,943 milch cows, 7,935 other cattle, 10,602 sheep, and 29,834 swine; 6 manufactories of agricultural implements, 11 of carriages, 4 of furniture, 1 of iron castings, 3 of machinery, 4 of marble and stone work, 1 of pumps, 6 of saddlery and harness, 1 woollen mill, 2 breweries, 4 saw mills, and 4 flour mills. Capital, Decatur. **VI.** A N. county of Missouri, drained by Chariton river and its E. fork, and branches of Salt river; area, 828 sq. m.; pop. in 1870, 23,230, of whom 1,496 were colored. The surface is undulating and the soil fertile. It is intersected by the St. Louis, Kansas City, and Northern, and the Hannibal and St. Joseph railroads. The chief productions in 1870 were 110,156 bushels of wheat, 857,327 of Indian corn, 411,510 of oats, 72,834 of potatoes, 355,767 lbs. of tobacco, 55,407 of wool, 412,146 of butter, and 12,385 tons of hay. There were 7,765 horses, 1,491 mules and asses, 6,635 milch cows, 11,018 other cattle, 22,757 sheep, and 31,540 swine; 12 flour mills, 14 saw mills, and 3 wool-carding and cloth-dressing establishments. Capital, Macon City.

**MACON**, a city and the capital of Bibb co., Georgia, situated on both sides of the Ocmulgee river, here crossed by a bridge, at the head of steamboat navigation, 80 m. S. E. of Atlanta, and 160 m. W. by N. of Savannah; pop. in 1850, 5,720; in 1860, 8,247; in 1870, 10,810, of whom 5,183 were colored. It occupies an elevated and healthy site, is well laid out, most of the streets being 180 ft. wide and adorned with shade trees, and has many handsome buildings. The central city park, combining

pleasure and fair grounds, was laid out in 1870 at a cost of \$125,000, and possesses great beauty. Rose Hill cemetery, near Macon, is one of the most beautiful burial grounds in the

United States. It is situated on the Ocmulgee, about half a mile below the city, mostly on elevated ground, the highest point being 142 ft. above the bed of the river, and com-



Macon, Georgia.

prises about 50 acres. Macon has ample means of communication by the Central, Southwestern, Macon and Augusta, Macon and Brunswick, and Macon and Western railroads, which centre here, and carries on an important trade. These roads have workshops in the city, and there are also three iron founderies and machine shops, a cotton factory, several flouring mills, and manufactories of sash and blinds, brick, &c. The banking capital amounts to \$1,032,000, distributed between one national and five state banks. Macon is the seat of the state academy for the blind, which occupies an imposing brick edifice four stories high, and has a library of 2,000 volumes. Mercer university (Baptist) was organized in 1838, and in 1871-'2 had 5 professors, 82 students, and 9,000 volumes in its libraries, including those of the college societies. A theological department is connected with it. The Wesleyan female college, organized in 1839, in 1872-'3 had 13 instructors and 190 students. A daily, a semi-weekly, and two weekly newspapers are published, and there are seven churches. Macon was settled in 1823.

**MACON**, a city and the capital of Macon co., Missouri, at the intersection of the Hannibal and St. Joseph, and the St. Louis, Kansas City, and Northern railroads, 170 m. N. W. of St. Louis, and 80 m. N. of Jefferson City; pop. in 1870, 3,678, of whom 920 were colored. It has a wagon factory with a capital of \$50,000, a savings bank, a private bank, two public school houses (one for white children, costing \$20,000, and one for colored, costing \$5,000), four weekly newspapers, and 12 churches. It is the seat of Macon academy, formerly Johnson male and female college.

**MACON** (anc. *Matiseo*), a town of Burgundy, France, capital of the department of Saône-et-Loire, on the left bank of the Saône, 208 m.

S. E. of Paris, and 37 m. N. of Lyons; pop. in 1866, 18,382. It has a college, a normal school, an agricultural and scientific society, and manufactories of clocks, watches, machinery, casks, earthenware, copperware, woollen coverlets, velvet, &c. *Mâcon* is the centre of a great trade in Burgundy wine. The best sorts are the growths of Thorins and Moulin à Vent, which are red, and of Pouilly, a white wine. The commerce in grain, hoops, horns, and cattle is considerable. Lamartine was a native of *Mâcon*. It was the seat of a bishopric from the 5th century till the revolution. (See *MÂCONNAIS*.)

**MACON**, Nathaniel, an American statesman, born in Warren co., N. C., in 1757, died at his plantation in the same county, June 29, 1837. He was studying at Princeton, N. J., at the opening of the war of the revolution. In 1777 he left college, and served for a short time as a private in a company of volunteers. Returning to North Carolina, he entered upon the study of the law, but soon enlisted again as a volunteer, and, though several offices were urged on him, served as a common soldier under the command of his brother, Col. John Macon. He continued in the army till the provisional treaty of peace in 1782, and was present at the fall of Charleston, the rout at Camden, and during the pursuit of Greene across Carolina by Lord Cornwallis. For his military service he refused any pay, nor would he accept a pension. While yet in the army, in 1780, he was elected a member of the senate of North Carolina, in which post he continued to serve through 1785, and though very young was employed on the most important committees of that body. He advocated the scheme of pledging the credit of the state to redeem her paper issues at their then depreciated rates, but held that the promises of the state must at any rate be redeemed. During this period he

settled on a plantation on the bank of the Roanoke, in Warren co., and made this spot his home for the remainder of his life, finding his main occupation and enjoyment in the cultivation of his farm. When the constitution of the United States was first submitted to the vote of the people of North Carolina, he opposed it as conferring too much power on the new government. He was a member of congress from 1791 to 1815, and was the speaker of the house from 1801 to 1806, when he declined renomination. He was transferred in 1816 to the senate, where he served till 1828, being president *pro tem.* in 1825-'7. Twice during Jefferson's administration he declined the office of postmaster general. At the general election in 1824 the state of Virginia cast for him her 24 electoral votes for the vice presidency of the United States. In 1828 he resigned his seat in the senate and several local offices, having been a member of congress for 37 successive years. He presided over the convention called to revise the constitution of North Carolina in 1835, and was a member of the electoral college of that state in 1836. In congress Mr. Macon voted for the embargo, and for the declaration of war against Great Britain, but held that the war should be defensive only, and so refused to enlarge the naval force beyond what was needed to guard the coasts, voted against a system of fortifications, against privateering, &c. He also voted against all schemes of internal improvement to be undertaken by congress, spoke in 1795 against a grant to the count de Grasse, and in 1824 against a grant of lands to Gen. Lafayette for revolutionary services. In the convention of North Carolina he spoke against giving to free negroes the right to vote; against a land qualification of voters; against the state engaging in any works of internal improvement; against all religious tests as a condition of holding office; and in favor of voting *viva voce* at all elections. He died after only a few hours' illness, but had already given directions to a neighbor to make for him a plain coffin, to be paid for before his interment, had selected for the place of his burial a barren ridge, where the plough could never come, and ordered the spot to be marked only by a pile of loose stones from the field. Mr. Macon was a student of few books besides the Bible, and was a member of the Baptist church. Mr. Jefferson called him "the last of the Romans;" and Mr. Randolph pronounced him "the wisest man he ever knew." A sketch of his life, by Edward R. Cotton, was published at Baltimore in 1840.

**MACONNAIS**, an ancient territory in Burgundy, now comprised in the department of Saône-et-Loire. It was inhabited by the *Ædui*, conquered by Julius Cæsar, and in the 5th century by the Burgundians. Afterward it was united to the empire of Charlemagne, and at the end of the 9th century to Cisjurane Burgundy. It became a hereditary county in the 10th century, and was purchased by Louis IX. in the

early part of the 13th. The duke of Berry came into possession of it in the middle of the 14th century. It was restored to the crown in 1416; 19 years afterward Charles VII. gave it to Philip the Good, duke of Burgundy; and it was finally reunited to the French crown in 1477. Capital, Mâcon.

**MACOUPIN**, a S. W. county of Illinois, drained by Macoupin, Otter, and Cahokia creeks; area, 864 sq. m.; pop. in 1870, 32,726. It has a diversified surface and excellent soil. It is traversed by the Chicago and Alton, the Indianapolis and St. Louis, and other railroads. The chief productions in 1870 were 861,558 bushels of wheat, 1,051,544 of Indian corn, 459,417 of oats, 60,964 of potatoes, 88,080 lbs. of wool, 291,608 of butter, and 42,423 tons of hay. There were 12,926 horses, 2,007 mules and asses, 6,907 milch cows, 11,846 other cattle, 17,670 sheep, and 32,395 swine; 6 manufacturing of agricultural implements, 5 of brick, 17 of carriages, 7 of cooperage, 10 of saddlery and harness, 1 of woollen goods, and 14 flour mills. Capital, Carlinville.

**MACPHERSON. I.** A central county of Kansas, intersected by the Little Arkansas and Smoky Hill rivers; area, 1,080 sq. m.; pop. in 1870, 738. The surface consists of rolling prairies, well adapted to stock raising. The chief productions in 1870 were 5,138 bushels of wheat, 40,540 of Indian corn, 3,458 of potatoes, and 1,444 tons of hay. There were 263 horses, 340 milch cows, 1,650 other cattle, and 260 swine. Capital, Lindborg. **II.** A central county of Dakota, recently formed, and not included in the census of 1870; area, about 1,050 sq. m. The E. part is drained by the Elm and Maple rivers, affluents of the Dakota. The surface is elevated, the W. portion being occupied by the Plateau du Coteau du Missouri.

**MACPHERSON, James**, a Scottish author, born in Ruthven, Inverness-shire, in 1738, died at his seat of Belleville, Feb. 17, 1796. He completed his education at King's college, Aberdeen, and is supposed to have studied for the ministry. At the university he gave evidences of a taste for poetry, and in his 20th year published a poem in six cantos entitled "The Highlander." Subsequently, while a private tutor in the family of Mr. Graham of Balgowan, he was encouraged to publish a small volume entitled "Fragments of Ancient Poetry collected in the Highlands of Scotland," and purporting to be a translation of genuine remains of ancient Celtic poetry. The enthusiasm with which these "Fragments" were received was universal; men of letters expressed the highest opinion of their value; and a subscription was immediately raised to enable the author to undertake a mission to the highlands and secure such remaining specimens of Celtic poetry as might yet be recovered. Macpherson accordingly made an extensive tour through the mainland and islands inhabited by the Gaelic race, and published in 1762, as the first result of his explorations, "Fingal,



an ancient Epic Poem in six Books; together with several other Poems composed by Ossian, the son of Fingal, translated from the Gaelic" (4to), which was succeeded in the following year by "Temora, in eight Books, with other Poems by Ossian." The reception of the first of these works was extremely flattering, and not only was it read with avidity in Great Britain, but it was translated into the principal European languages. With the publication of "Temora," however, a change began to take place in public opinion, and a party sprung up which did not hesitate to question the authenticity of the alleged translations. Macpherson affected to treat such doubts with contempt. In 1764 he received the appointment of secretary to Gov. Johnstone of Pensacola; but after spending a short time in that colony and visiting other parts of North America, he returned in 1766 to England, and fixed his residence in London. In 1771 he published "An Introduction to the History of Great Britain" (4to), which was attacked with a severity little calculated to improve the author's irritable temper. Shortly afterward he still further endangered his literary reputation by a prose translation of the *Iliad* (1773), which was almost universally condemned as beneath criticism. In 1775 he produced his "History of Great Britain from the Restoration to the Accession of the House of Hanover" (2 vols. 4to), written in the tory interest to detract from the integrity and patriotism of the men who had brought about the revolution of 1688, for the copyright of which he received £3,000; and about the same time he employed his pen in the service of the government, producing "The Rights of Great Britain asserted against the Claims of the Colonies" (1776), and "A Short History of the Opposition during the last Session of Parliament" (1779), both of which went through several editions, the latter being generally attributed to Gibbon. In reward for his services he was appointed agent to the nabob of Arcot, and was returned a member of parliament for Camelford, which he represented for upward of ten years. Compelled by failing health to withdraw from public life, he built a handsome seat at Belleville in his native county, whither he retired a few years before his death. His remaining works relate principally to Indian affairs. At his own request he was buried in Westminster abbey, the expense of erecting his monument being defrayed by himself.—The controversy respecting the authenticity of the alleged translations from the poems of Ossian, though now of comparatively little interest, was one of the most important in English literary history, as well on account of the eminence of those who participated in it, as of the activity and bitterness with which it was waged. Various shades of opinion, from utter disbelief in the Ossianic poems to enthusiastic adoption of every word they contained, characterized the arguments of the controversialists, the two extremes being

represented by Dr. Johnson and a few others on the one side, and by Drs. Blair and Gregory, Lord Kames, and Sir John Sinclair on the other. Others again believed that the poems were to a certain extent authentic, the remainder being interpolations; while a fourth party, including David Hume, entertained strong doubts of their authenticity, but hesitated to declare them entirely spurious. During the progress of the controversy Macpherson maintained an obstinate silence, making no effort to rebut the charge of literary forgery brought against him, refusing to afford proofs of the authenticity of his translations, and affecting only indignation that his veracity should be called in question. When urged by the highland society of London (which, after a careful inquiry into the whole subject, had reported that no single poem, "the same in title and tenor with the poems published," could be discovered in all Scotland) to publish the originals of his Ossianic poems, he promised to employ his leisure time in arranging and printing them. At the time of his death, nevertheless, which occurred 33 years subsequent to the appearance of "Temora," they were not ready for the press, and only in 1806 were given to the world by Sir John Sinclair. But as the manuscripts were all in the handwriting of Macpherson or of his amanuenses, the proof of their authenticity was in no degree advanced; and it has been generally believed that, whatever may have been the source from which the English versions of Ossian were derived, the so-called "originals" were translated from them into Gaelic by Macpherson himself or by other persons in his employ; hence the delay in their publication. Within a few years past the controversy has been revived in Scotland, and the authenticity of the poems has found several earnest defenders. The question has also been started whether they are of Scotch or Irish origin. The poems themselves, which, notwithstanding their false imagery, the perpetual recurrence of the same ideas, the verbiage and bombast with which they abound, contain passages conceived with true feeling and power, have fallen into comparative neglect.

**MACRAUCHENIA** (Owen), a genus of fossil herbivorous animals, forming one of the connecting links between the paleotherium and other extinct pachyderms of the Paris basin and the camel family, especially its American representatives. This genus was established in 1838 by Prof. Owen on some vertebrae and bones of extremities obtained by Mr. Darwin in Patagonia, from an irregular bed of pale reddish earth and sand, evidently of subaqueous origin, overlying the porphyritic gravel at St. Julian, in lat. 49° 14' S.; the gravel bed itself was over the pumiceous strata and argillaceous beds of the upper tertiary formation. The bones were found in a deep furrow in the upper tertiary filled with the earthy deposit, evidently but recently elevated above the sea; indicating that this animal lived after the gravel was

spread over this plain, and long after the existence of recent shells, which, according to Darwin, are among the most common now living on the coast. The *M. patachonica* (Owen) was as large as the present hippopotamus and rhinoceros. The cervical vertebræ were very much like those of the llama, forming a long and slender neck, bearing probably a comparatively small head without a proboscis; as in the llama, these have no canal for the vertebral artery in their transverse processes, this vessel passing for a considerable part of its course in the spinal canal itself; their form is also elongated, with a slight anterior convexity and posterior concavity on their articulating surfaces, indicating a less freedom of motion in the neck. The lumbar vertebræ, though seven in number as in the llama, in their form and the structure of their articulating surfaces resemble those of pachyderms, and indicate a slight concavity in the region of the loins. The union of the radius to the ulna, and of the fibula to the tibia, approximates it to the ruminants; but the feet resemble those of pachyderms (like the tapir) in having separated metacarpals, and three almost equal fingers terminating each in a small rounded hoof. According to Pictet, the molar teeth resemble those of the palæotherium, the last lower one having no third lobe, and the premolars being more simple. For details see Owen's description of the fossil mammals in the "Zoölogy of the Voyage of the Beagle" (1840).

**MACREADY, William Charles**, an English actor, born in London, March 3, 1793, died at Weston-super-Mare, Somersetshire, April 29, 1873. His father, the lessee and manager of several provincial theatres, having designed him for one of the learned professions, he was placed at 10 years of age at Rugby school, where he attained considerable reputation as a classical scholar; but about 1810 he was induced by his father's pecuniary embarrassment to go upon the stage. He made his début at the Birmingham theatre in June of that year as Romeo, and soon acquired a respectable position upon the provincial boards. He made his first appearance in London at Covent Garden theatre, Sept. 16, 1816, as Orestes in Phillips's tragedy of "The Distressed Mother," and was pronounced by Hazlitt "by far the best actor that had come out in his remembrance, with the exception of Mr. Kean." From that time forward he continued to rise steadily in the public estimation, until he was generally recognized as the first of English tragedians. Among his most successful personations aside from the Shakespearian plays were Virginius, Cains Gracchus, and William Tell in Knowles's dramas, Melantius in "The Bridal," Rob Roy, Gambia, Werner, and Richelieu. As a delineator of Shakespeare's heroes he attempted a wide range of characters, but was most successful in Macbeth, Hamlet, Othello, Coriolanus, and Leontes. In 1826 he made a successful tour through the United States, and in 1828 visited

Paris, where he was received with great favor. In 1837 he undertook the management of Covent Garden theatre, but retired at the end of the second season, and for two seasons commencing with 1840 he had charge of Drury Lane. As a manager he did much to elevate the standard of dramatic representations, and to relieve the theatre of its reputation for immorality and profligacy. The enterprise nevertheless was pecuniarily unsuccessful. In 1843-'4 he played a series of engagements in the United States, which he again revisited in 1848. In consequence of a misunderstanding of some years' existence between Edwin Forrest and himself, the friends of Forrest threatened to prevent the appearance of Macready in New York. He nevertheless played for a number of nights at the Astor Place opera house in October, 1848; but upon commencing a farewell engagement there in the succeeding May he was menaced by serious opposition. On Monday, May 7, when he appeared as Macbeth, such was the confusion that the manager was obliged to order the curtain to fall before the termination of the performance. Macready was thereupon inclined to resign his engagement; but upon the publication in the newspapers of a card signed by many citizens, requesting him to remain, and promising to protect him in the discharge of his professional duties, he consented to reappear on the following Thursday. On that evening, owing to the precautions taken to preserve order in the house, he succeeded in performing his part. Outside of the theatre the friends of Forrest, after vainly endeavoring to effect an entrance, commenced an attack upon the building with stones and other missiles. The police being unable to restrain the mob, the military were called out, and after several volleys of musketry, by which 22 persons were killed and 36 wounded, the riot was quelled. Though assured of ample protection, Macready determined to make no further attempt to act in New York, and soon after left the country. In 1850-'51 he performed a series of farewell engagements in England, and on Feb. 26, 1851, took a formal leave of the stage at Drury Lane theatre. On March 1 a complimentary dinner was given to him in London, which was numerously attended. His rank as an actor was due principally to intelligent study, his genius being the reverse of impulsive, and his imagination not of that plastic nature which can instantly seize and embody impressions. Many excellent plays of Bulwer, Talfourd, Knowles, Browning, Marston, White, Taylor, and others, were brought out under his auspices; and his exertions to elevate his art, and to suppress the vicious tendencies connected with it, had a beneficial effect.—See his "Reminiscences and Diaries," edited by Sir Frederick Pollock (1875).

**MACRINUS**, Roman emperor from April, A. D. 217, to June, 218, born in Cæsarea, Mauritania, in 164. Of the humblest parentage, he was admitted into the employment of Plau-

tianus, the favorite of Septimius Severus, and received successive appointments in the imperial household, until he became prefect of the prætorians under Caracalla. On the death of the latter, whose assassination he plotted, he was proclaimed emperor, gaining the favor of the prætorians by a liberal donative and of the senate by repealing some obnoxious taxes. He immediately marched against the Parthians under Artabanus, and was signally defeated by them near Nisibis. His enforcement of discipline caused disaffection among his troops, a portion of whom renounced their allegiance to him in favor of the pretender Elagabalus. He marched against the latter, was defeated at Antioch, fled in disguise to Chalcedon, was betrayed, and was put to death in Cappadocia.

**MACROBIUS, Ambrosius Aurelius Theodosius**, known as the grammarian, a Latin author of the 5th century. Little is known of his life, but the frequent Hellenisms in his writings indicate that he was a Greek; and though he mentions the massacre of the innocents by Herod, he appears to have been a heathen, following the Neo-Platonist philosophy of his time. Three of his works are extant: *Saturnaliorum Convivorum Libri VII.*, a series of dissertations, in the manner of the dialogues of Plato, discussing the attributes and festivals of Saturn and Janus and the Roman calendar, commenting on the works of Virgil, and treating various other subjects; *Commentarius ex Cicerone in Somnium Scipionis*, a work greatly admired during the middle ages, which discourses of the constitution of the universe according to the views of the Neo-Platonists; and *De Differentiis et Societatibus Græci Latine Verbi*, a grammatical treatise, abridged in the time of Charles the Bald from the original work, which is now lost. The best edition of his works is that of Gronovius (Leyden, 1670), but it does not contain the *De Differentiis*, which was published in Paris in 1533. His works have been twice translated into French (Paris, 1826, and 3 vols., 1845-'7), but not into English.

**McTYEIRE, Holland Nimmons**, an American clergyman, born in Barnwell district, S. C., July 28, 1824. He graduated at Randolph Macon college in 1844, and was appointed professor of ancient languages and mathematics there. After a year he entered the Virginia conference of the Methodist Episcopal church, South, and was stationed at Williamsburg, Va., whence he was transferred in 1846 to Mobile, Ala. He preached in New Orleans two years (1849-'51), after which he became editor of the New Orleans "Christian Advocate." In 1858 he was elected by the general conference editor of the "Christian Advocate" at Nashville, Tenn. In 1866 he was elected a bishop, and in 1873 president of the board of trust of Vanderbilt university, Nashville, Tenn. He is the author of a prize essay on "The Duties of Christian Masters," and a "Manual of the Discipline" (1870). He received the degree of

D. D. in 1858 both from the Wesleyan university, Alabama, and Emory college, Georgia.

**McVICKAR, John**, an American clergyman, born in New York, Aug. 10, 1787, died there, Oct. 29, 1868. He graduated at Columbia college in 1804, and spent some time in England with his father. He entered the ministry of the Protestant Episcopal church in 1811, and became rector of St. James's church, Hyde Park, on the Hudson. In 1817 he was appointed professor of moral philosophy, rhetoric, and belles-lettres (to which was afterward added the evidences of Christianity) in Columbia college, which office he occupied for nearly half a century. In 1830 he made a visit to England and the continent. From 1844 to 1862 he was also chaplain at Fort Columbus, Governor's Island. In 1864 he retired from active duty in the college, but was made emeritus professor. He was also for many years actively engaged in the guidance and direction of Episcopal church work in the state of New York. Besides a number of occasional pamphlets and essays, he published "Narrative of the Life of Dr. Samuel Bard" (1825); "Outlines of Political Economy" (1825); "Memoir of the Rev. Edmund D. Griffin" (1831); "Early Years of Bishop Hobart" (1834); and "Professional Years of Bishop Hobart" (1836). His life has been written by his son, W. A. McVickar, D. D. (1873).

**McWHORTER, Alexander**, an American clergyman, born in Newcastle co., Del., July 15, 1734, died in Newark, N. J., July 20, 1807. In 1756 he entered the junior class in the college of New Jersey, then at Newark, but removed the next year to Princeton, where he graduated shortly after. He studied theology with William Tennent, was licensed to preach by the presbytery of New Brunswick in 1758, and in the following year was installed pastor of the church in Newark, which office he retained with some interruption for nearly half a century. In 1764 he was appointed by the synod of New York and Philadelphia to a mission in North Carolina, where his friends were settled, and where he was invited to settle, but declined; and after visiting Boston, he returned to Newark in 1766. In 1775 he was sent by congress to western North Carolina to persuade the numerous royalists there to adopt the patriot cause. In 1776 he visited the army encamped opposite Trenton, and was present at the passage of the Delaware and the surprise of the Hessians. In 1778 he became chaplain of Knox's artillery brigade. In 1779 he accepted a pastorate and the presidency of Charlotte academy, in Mecklenburg co., N. C.; but the place being captured by Cornwallis, he lost his library and furniture, and was recalled and in 1781 reinstated at Newark. In 1788 he was prominent in forming the constitution of the Presbyterian church of the United States. Dr. McWhorter was for 35 years a trustee of the college of New Jersey; and after the burning of the college buildings in 1802, the collec-

tion of funds for a new edifice was chiefly due to his influence and personal solicitations in New England. In 1800 he published a century sermon, describing the settlement and progress of the town of Newark, and in 1803 a collection of sermons in 2 vols. 8vo.

**MADAGASCAR**, the largest and most important of the African islands, situated in the Indian ocean, between lat.  $11^{\circ} 57'$  and  $25^{\circ} 42' S.$ , and lon.  $43^{\circ} 10'$  and  $50^{\circ} 25' E.$ , separated from Africa by the Mozambique channel, which is in its narrowest part about 250 m. broad; length of the island, from Cape Amber in the north to Cape St. Mary in the south, about 1,030 m.; average breadth 225 m., greatest breadth (in the centre) about 350 m.; area

the north, and opposite its mouth are several small islands. Between Antongil bay and Foul point lies St. Mary's island, 31 m. long and 3 broad, belonging to France. Tamatave, lat.  $18^{\circ} 10'$ , is the most frequented port on the E. coast. It has good anchorage, but ships are exposed to easterly winds in its harbor. S. of Tamatave there are no ports of consequence excepting Fort Dauphin, lat.  $25^{\circ}$ , where the French carry on a small trade. The W. coast is much more irregular in outline, being broken by numerous bays and capes. The principal bays between Capes Ambar and St. Andrew are Ambarou or Chimpaiki, Passandava, Narinda, Mazamba, and Bembatooka; the principal capes, St. Sebastian and Ambarata. On the N. side of Bembatooka bay is Majunga, a large town and the principal port of the island. A number of small islands lie along this coast, the largest of which is Nossi Be, belonging to France. From Cape St. Andrew to Cape St. Vincent, lat.  $21^{\circ} 55'$ , the coast line is comparatively regular. S. of the latter cape are Murderer's bay and the bay of St. Augustin. —The N. E. portion of the island is quite mountainous, the chains (the central one of granitic formation) pursuing a direction generally from N. N. E. to S. S. W., and rising to a general level of 3,000 to 4,000 ft. The highest summit is Ankaratra, which is estimated at from 6,500 to 12,000 ft. These mountain ranges are separated by sandy plains, or barren plateaus cleft by deep ravines. The granitic mountains end in lat.  $22^{\circ} S.$ , and undulating plains stretch southward and westward to the coast. The S. region is of secondary formation, and has little fertility except along the infrequent watercourses. The only fertile region of any extent in the island is the E. slope of the northern mountain region, which is watered by frequent rains from the Indian ocean. It is covered by a narrow uninterrupted line of forests. The whole island may be divided into the E. and W. slopes, the former being from 30 to 80 m. wide, while the latter extends over three or four degrees, and is traversed by important rivers. The most remarkable river flowing E. is the Mananguru, which is obstructed by islets and rocks almost to its mouth. No river flowing E. is navigable even for the smallest pirogues more than 10 m. from its mouth. On the W. coast several rivers are navigable for 30 or 40 m. The Tsidsubu or Menabe is ascended by pirogues to the foot of the central range of mountains. The Betsibooka is said to be navigable by small vessels for 160 m. The Mangooka or St. Vincent's is also a navigable river. The S. W. region has no rivers of importance. Madagascar is not rich in lakes. The largest are Itasa and Alaoutre, the latter 30 m. long. Along the E. coast is a series of fresh and salt lagoons formed by the overflow of the rivers or of the sea. The great salt lake of Mananpetsootse is about 20 m. long; it is very narrow and very salt, and contains no fish. There are many



estimated at 230,000 sq. m.; pop. about 5,000,000. The E. coast, beginning at Cape Amber, follows a S. by E. course to Cape East or Ngoney, lat.  $15^{\circ} 12'$ , when it turns S. by W. and pursues a nearly straight course to lat.  $25^{\circ} S.$ , after which it runs W. by S. to Cape St. Mary. On this coast are a number of good harbors. On the north is Diego Suarez, a bay with five large harbors, all well protected; next Port Luquez, a large inlet, and Port Leven; then Vohemare, protected by a coral reef, and with water deep enough for large ships; further S., in lat.  $16^{\circ}$ , is the bay of Antongil, so called from Antonio Gil, its discoverer, the largest inlet of the island. The river Tingabale, navigable for boats, enters this bay on

medicinal and warm springs, but they are not used on account of superstitious prejudices.—The climate is exceedingly diversified, both in temperature and salubrity. In the low lands and on the coast the heat is intense; but in the interior the mercury seldom rises above 85°, and on the mountain summits ice is sometimes formed. The rainy season continues from December to April. The coast region, with few exceptions, is extremely unhealthy to natives of the interior as well as to Europeans. The rank vegetation and stagnant water cause a deadly fever. This is also the case in many interior valleys, only Ankova and some elevated regions in the north being exempt from it. One elevated spot near Tananarivo is so unhealthy, that banishment to it is considered equivalent to condemnation to death.—Of the geology of the island few details are known. The hills between the E. coast and the interior appear to consist of primary rocks; gneiss, granite, and quartz are found, and also basalt and large beds of clay. In other parts slate and limestone have been seen. Excellent iron abounds in the interior. In the mountainous district of Ankaratra volcanic rocks occupy an extensive area. Rock salt is an important article of inland trade, and it is said that there is coal on one of the affluents of the Betsibooka.—The botany of the island is exceedingly rich, and is yet mostly unexplored. Among the plants peculiar to it is the ravenala or “traveller’s tree” (*urania speciosa*), so called because at all seasons its trunk, when an incision is made, yields a cool, sweet, and wholesome beverage. Its wood is used in the construction of dwellings, and for many domestic purposes. The zozoro (a papyrus) is also peculiar to the island. In the forests are found ebony and a species of mahogany. Other valuable trees are the filao; the baobab, which abounds on the W. coast; the ampaly, whose hard leaf is used to polish wooden ware; the avoha, from which coarse paper is made; the *tapia edulis*, on which the native silkworm is reared; the tamarind, the aviavy and other species of fig, the vakoa or screw pine, the dragon tree, and the bamboo. The azaina is used for canoes, which are made by scooping out the trunk; it yields a great quantity of yellow juice, very adhesive, and used by the natives as glue. The voahena, which furnishes gum elastic, is abundant. Madagascar produces rice, which is the principal food of the people, tobacco, sugar, cotton, indigo, and various spices; also coconuts, breadfruit, plantains, bananas, yams, and a great variety of tropical and temperate fruits. The coffee plant has been introduced, and thrives well. Ten or twelve kinds of vegetable oil are made for home consumption. Domestic poultry of all kinds is reared in profusion. Cattle, both wild and tame, are numerous, and are generally humped, as in India. Sheep and pigs are found in some districts. The sheep, like those of the Cape of Good Hope, have long legs and fat tails, and are covered with

hair instead of wool. Horses have been recently introduced. In the forests are wild hogs, dogs, and cats, ounces or small leopards, monkeys, foxes, squirrels, and the curious animal called the aye-aye. (See AYE-AYE.) The rivers swarm with crocodiles, which are sometimes found 20 ft. long. They destroy cattle, and sometimes human beings. The natives regard them with veneration, and dare not injure them even in self-defence. Serpents of great size are found, but few are venomous. From St. Mary’s island to Antongil the coast abounds with excellent oysters. Fossil remains are found, among which are those of a colossal bird, the *opyornis maximus*; these consist of the bones of the foot, and fragments of eggs, six times as large as those of the ostrich.—It has been usual to consider Madagascar as one kingdom of 22 provinces, with Tananarivo, in the centre, for its capital; but this town is only the capital of Imerina in Ankova, the territory of the Hovas, the dominant tribe. The Hovas exercise no authority S. of their fort of Manza, and many tribes are practically and some absolutely independent. The Antandronis are subject to several petty chiefs of their own, who are continually at war with one another. The Madagascans are derived from a variety of stocks. The two great divisions of the people are into black and olive, the former occupying the western slope of the island, and the latter the eastern. The olive race is distinguished by a light, exquisitely formed person, fair complexion, and straight or curling hair; while the black race is of more robust form, and has woolly hair. Besides these two great ethnological divisions, the population is distinguished into four political or geographical sections: the Hovas, the Sakalavas, the Betsileos, and the Betsimasarakas. The Hovas have within the present century made themselves the dominant tribe. In person they are generally below the middle stature; their complexion is a light olive; their features are rather flat than prominent; their lips occasionally thick and projecting, but often thin as in the Caucasian race; their hair is black, but soft, fine, and straight or curling; their eyes are hazel, and their figures erect and well proportioned. They are remarkably active, but have less bodily strength than the black tribes. The Sakalavas during the last century were the dominant nation, and held the Hovas in subjection. Physically they are the finest race in Madagascar. They are tall and robust, and their limbs well formed, muscular, and strong. Their features are regular, their eyes dark, and their hair black, shining, and crisped or curly. Their complexion is blacker than that of any other people in the island. In war they are bold, energetic, and resolute; in peace they are indolent, and much addicted to sorcery and other superstitious practices. They are friendly to Europeans, evince a strong desire for improvement, and are said to exhibit ample proofs of mental powers capable under



proper culture of the highest attainments. They are more numerous than the Hovas, and occupy the western coast. The Betsileos are low in stature, slender in figure, erect and nimble in their movements. Their color is dark, though some are of light copper complexion. Their lips are thick, their eyes hazel, and their hair black, long, and curling. They are a modest and unassuming people, inferior to the Hovas in energy and enterprise, but peaceful and laborious cultivators of the soil. The Betsimasarakas are taller than the Betsileos, and next to the Hovas are the fairest people in the island. Their hair, though not always black, is generally frizzly. They are peculiarly distinguished for cleanliness in their houses and apparel, but are reputed to be of lower morals than any other portion of the people. On the E. coast a small part of the population is descended from the Arabs, who for centuries have traded to Madagascar.—The Hovas, having adopted Christianity under the lead of Queen Rasoherina II., abandoned many of their heathen customs and superstitions, which however still have a footing in many parts of the island. Among these are infanticide, the victims being chiefly those born on days or at hours pronounced unlucky, and polygamy, which was limited only by the restriction of all except the king to 12 wives, and with it an almost unlimited liberty of divorce on the part of the husband. Circumcision was practised, but rather as a political than a religious ceremony, being regarded in some respects as an initiation into the rank, privileges, and obligations of manhood and citizenship, and in some sense as a transfer of the subjects from the jurisdiction of the parent to that of the king. The rite was performed on a large number of boys at once by order of the sovereign, and at a time fixed by him. Slavery was introduced in Madagascar at a very early period, and still exists, although nominally abolished. Captives taken in battle and tribes conquered in war were reduced to bondage, and their descendants generally still remain in that state. Free persons also sometimes become slaves by their own act, by selling themselves when reduced to poverty. A father may also sell his children into slavery in certain cases. Many are made slaves by the sentence of the judges or the edict of the sovereign. Slavery is considered the heaviest penalty of the law, and is attended with confiscation of property and the enslaving of the criminal's wives and children. Some of the nobles have many hundred slaves. The master has absolute power, except that death can only be inflicted by order of the king. Between the slaves and the freemen there is an intermediate class, composed chiefly of those who labor for the government, especially those employed in felling timber or in burning charcoal. In one of the great forests near Tananarivo, the woodcutters, called the "twelve hundred," though their number is nearer 2,000, are employed through life in

felling and preparing for building or other purposes timber for the government. They build their huts and rear their families in the recesses of the forest, and cultivate enough land to yield them a scanty subsistence. Their male children are woodcutters from their birth, and labor at their vocation without any pay; and were any of them to abandon their occupation, they would be treated as criminals or deserters. The smiths or general workers in iron, the gunsmiths and spear makers, carpenters, tailors, and all other workmen employed by the king of the Hovas, are expected to labor for life without wages, and to provide for the support of themselves and their families. The Bezanozano, a class inhabiting the eastern districts, are required to carry all goods for that sovereign from the coast to his capital, a distance of 300 m., without pay.—The Madagascans are generally remarkably hospitable. Whenever a stranger enters a village, a present is brought him of whatever refreshment the place affords. If he approaches a house, he is cordially invited to enter, and treated with the utmost attention and civility. Vegetables of all kinds are abundant, and cattle and poultry are plentiful and cheap. Locusts, of which large swarms appear in the spring and summer, form an important article of food. They are gathered in baskets by the women and children, and after the legs and wings have been picked off they are partially boiled, and then dried in the sun. The silkworm also in its chrysalis state is cooked and eaten in some provinces. But the most general article of support is rice, which is native to the island. Next to it, the most valuable kinds of food are maize, manioc, arrowroot, which is the principal food of the Sakalavas, and several varieties of yam, together with a number of European vegetables which have been introduced. In 1872 several parties of English subjects began to plant cotton in the S. part of the island, having brought seed from the Feejee islands. They employed Madras coolies, as labor in Madagascar cannot be relied on. Parties from Mauritius have planted sugar cane and built mills for making sugar; but the crop is exported to Mauritius for refining. Coffee also has been planted by foreigners in several parts of the island, with good success. The government fosters all such enterprises, and makes free grants of land for cultivation to any extent desired. A lichen used in dyeing grows on the bark of the thorny shrubs of the S. W. region, and constitutes its chief commercial wealth. The natives weave cotton and silk into handsome fabrics on looms of the rudest description. They also make beautiful carpets. The Madagascans are temperate in drinking, and water is almost the universal beverage, though a distilled spirit called *toaka* is occasionally used as a luxury. Ardent spirits are prohibited in Tananarivo, and drunkenness is almost unknown except at the seaports frequented by Europeans. Tobacco

is extensively cultivated, but is not smoked; it is mixed with other herbs and made into snuff, which is taken, not into the nose, but into the mouth. The *rongona* or native hemp is smoked in reed pipes. The favorite amusements are fishing, hunting wild cattle, bull baiting, cock fighting, and a game called *katra*, somewhat resembling draughts. The people are extremely fond of music, both vocal and instrumental, though they have not made much progress in either. They have, besides the drum, two native instruments of music, the *valiha* and the *lokanga*. The former is a bamboo having eight small slips cut from its rind between two of its joints, and then by means of small pieces of wood, used as bridges in a violin, elevated about a quarter of an inch. The player holds the instrument before him, and uses both hands in twitching the cords. The music is soft and plaintive; the tunes are few, short, and monotonous. The *lokanga* is made of a piece of wood notched at one end so as to form three or four rests for the cord or string. One string is stretched upon it and attached to the head of a hollowed calabash. The music is feeble and dull. The women sing in chorus with much skill and effect, and the villagers often assemble and pass the evening in singing and dancing. The houses of the better class are built of wood, and so well put together that they are perfectly firm, although joined without nails. They are oblong, invariably placed N. and S., with the door to the W. They often have verandas, but no chimneys, though the climate of the highlands is often cold enough for fires in the evening. The roof is covered with rushes, and rises to an extreme height, and ornamented poles at the gables indicate the owner's rank. The rich have many such houses. The poorer dwellings are built of bamboo, rushes, or clay, and are colored pink or yellow. The villages are surrounded by deep ditches, unless placed on inaccessible heights. The usual vehicle of travel is the *tacon*, a light palanquin borne upon the shoulders of four Bezanozanos or carriers.—The dress is uniform and simple. It consists generally of two and at most of three garments, chiefly of hemp or cotton, varied among the slaves and poorer classes by a cloth inferior to either of these, and manufactured from the bark of the rofia, the banana, and some other trees; and among the rich by silk or foreign cassimere and broadcloths. The *salaka*, a piece of cloth about a yard in width and two yards long, is fastened round the loins, passing under the body, and having the extremities in front reaching to the knees. The women wear a cloth called *kitamby*, of the same materials as the *salaka*, but considerably broader. It is worn round the person immediately below the breast, and reaches nearly to the feet. But the most important and characteristic garment is the *lamba* or mantle, which varies in dimensions and quality with the rank and circumstances of the wearer. It is worn by both

sexes and all classes, both adults and children; for adults it is usually three or four yards in length and two or three in breadth. The royal *lamba*, which is held in the highest estimation, is of fine scarlet English broadcloth, bordered and richly ornamented with gold lace; it is worn by the king on sacred festivals and state occasions. The use of a dress entirely scarlet is the exclusive privilege of the king, to whom is restricted also the distinction of using a scarlet umbrella. The *lamba* is worn by all classes over the shoulders, whence its folds hang loosely, reaching nearly to the ankles, the ends being drawn together in front of the wearer. By the men it is adjusted so as to hang principally over the left shoulder; by the women, over the right.—The Madagascans are remarkably fond of peddling and of frequenting public markets, which are held every day in the week in the neighborhood of the large towns, and at which vast multitudes assemble. Foreign commerce has long been carried on with the Arabs from Muscat and Zanzibar, and with traders from the W. coast of India, who bring raw silk, cotton cloth, gunpowder, trinkets, and other articles to the N. W. ports, particularly to Majunga, in the bay of Bembatooka. American vessels going up the Mozambique channel or from Tamatave to Zanzibar usually stop there to exchange cotton sheetings, hardware, furniture, gunpowder, and firearms for hides, rice, ebony, beeswax, and gum copal. There is also a trade with Mauritius and the Cape of Good Hope. The commerce of the E. coast is mostly at Tamatave, where a United States consular agent is accredited. In 1872 6 steamers and 99 sailing vessels, of an aggregate of 35,055 tons, entered this port; the total value of imports was \$377,361 90, of exports, \$382,066 02. The principal imports were cotton sheetings, calico prints, crockery, rum, shoes, salt, and hardware; principal exports, India rubber, beeves and swine, hides, beeswax, arrowroot, gum copal, and *rabannes*, a kind of coarse matting. The trade in India rubber began in 1869-'70, and in 1872 the export from Tamatave alone amounted to 449,591 lbs. The customs duties are 10 per cent. in kind on all imports and 10 per cent. in money on exports. The money in use is mostly French silver, the current piastre or dollar being the five-franc piece.—The government of the Hovas is a despotism, modified and tempered by customs and usages which have the force of law. Of late years, however, the military force at the command of the sovereign has so much increased, that there is little or no practical check upon the royal authority. The succession to the crown is hereditary in the royal family, but not in the direct line of descent, for the reigning sovereign designates his successor at pleasure. Females are not excluded from the throne. The nobles or *andriambarenti*, who rank next to the members of the royal family, fulfil the functions of judges. Their number is not fixed, but usually there are about 12 re-

siding at the capital. The officers of the army constitute also a powerful and well organized aristocracy. Rank among them is conferred by number from 1 up to 13. A colonel, for example, is a noble of the 9th honor, a general of the 11th, and a field marshal of the 13th. The army is large, well armed, and disciplined in the European manner. The revenues of the government arise from taxes, duties and customs, fines, and confiscations. They are not large, but the property belonging to the crown is considerable, and the practice of using the services of the subjects without paying for them precludes in a great measure the necessity of a large money revenue.—The native religion of the Madagascans is not very clearly understood. They have a vague belief in a supreme God, whom they call *Andria-manitra*, "the prince of heaven," and in an evil principle; but the people worship 12 or 15 principal idols, belonging respectively to different tribes or classes, of whom they are supposed to be the guardians or tutelary gods. Four of these are superior to the others, and are considered public and national. The two greatest idols, *Rakelimalaza* and *Ramahavaly*, were kept each at small villages about 7 m. from Tananarivo, where they were lodged in houses resembling the common dwellings of the people, there being no temples, and no priests except the men who have charge of the idols. In September, 1869, both were publicly destroyed by order of the government, in order to convince the pagan masses, who demanded the return of the queen to the native religion, that their gods were powerless. The worship of the dead is also a part of their religion. The Madagascans are much addicted to divination, which they practise according to certain definite rules, with the help of beans, rice, straw, sand, or any other object that can be easily counted or divided. They also cast nativities and foretell fortunate days by the moon and its phases. Trial by ordeal until very recently prevailed extensively among them, principally by causing the accused to drink a decoction of a poisonous fruit called the *tangena*, a small dose of which acts as an emetic, while a large dose is generally fatal. By skilfully managing the size of the dose, those who administer it have it in their power to decide the result.—The Madagascans have no records of their history, but from their traditions and usages there is reason to believe that none of the races now existing in the island were its primitive inhabitants. An extinct race called the *Vazimba* seem to have preceded the present population; nothing is known of them except that they dwelt in the interior, and at a remote period were conquered by invaders and in time exterminated. The existence of the island was first made known to Europeans by Marco Polo in the 13th century; he did not visit it, but gathered in Asia some vague idea of its extent and position. It was discovered in 1506 by Lorenzo Almeida, son of the first Portuguese viceroy of India. The

Portuguese not long afterward made a settlement on the banks of the river Franchere in the province of Anosy, but their colony was soon massacred by the natives. The French in 1642 made an attempt to possess themselves of Madagascar, and settled a colony in Anosy. Several expeditions were subsequently sent thither, and for some years the French had considerable influence in the southern provinces, and claimed sovereignty over the whole country; but the climate and wars with the natives eventually compelled them to abandon the island. In 1644 the English had a fort at St. Augustin's bay, with a garrison of 200 men, of whom one fourth died of fever in two years, and the settlement was soon broken up. For a considerable period Madagascar was not molested by Europeans, till the close of the 17th century, when it became a favorite resort of pirates, who in time, under the lead of a Frenchman named Misson, formed a settlement and a sort of commonwealth, which they called *Libertalia*, on the N. E. coast. After committing great depredations, these buccaneers were suppressed by powerful naval forces sent against them by several European governments. About 1745 the French East India company took possession of the island of St. Mary's on the E. coast, and made a settlement there, and in 1768 they established another colony at Fort Dauphin at the S. E. extremity of Madagascar. In 1774 the celebrated Hungarian adventurer, Count Beniowsky, attempted to conquer Madagascar, and for a time met with considerable success; but his plans were frustrated by his violent death in 1786. (See BENIOWSKY.) At the beginning of the present century Madagascar was divided into a number of independent states, one of the most powerful of which was the kingdom of Imerina, a subdivision of Ankova, the country peopled by the Hovas. In 1808 Radama (born in 1792), the descendant of a long line of kings, ascended the throne of Imerina on the death of his father Impoina. This able and ambitious monarch was visited in 1816 by British agents, whom he received with great favor. He formed a treaty with them in 1817, by which the slave trade was abolished on condition of an annual supply of ammunition and arms from the British government, which also sent men to instruct the native soldiers in military tactics. With the arms and discipline thus obtained, Radama was in a few years enabled to subdue the whole island. In 1818 the London missionary society sent a number of missionaries, accompanied by artisans to instruct the people. The native language was reduced to writing, a grammar prepared, and the Bible translated and printed. In the course of ten years about 15,000 of the natives had learned to read, and a large number were converted to Christianity. Mr. Hastie, an Irishman sent by the British government as its agent, resided several years at the capital, where he had great influence. His counsels, which all tended to promote civiliza-

tion, had much weight with Radama, who was strongly imbued with love of truth and justice, and was humane and gentle in character. The king gave all the encouragement in his power to the missionaries, and great advances were made in civilizing the kingdom. Infanticide and other cruel customs were abolished, and rapid progress was made in the useful arts and in education. The premature death of Radama in 1828 put a stop to the advance of Madagascar. He was succeeded by his widow, Ranaivalona, who exerted herself to undo his work. The schools were closed and the missionaries driven from the island in 1835. The influence of the idol-keepers and of the supporters of divination and other superstitions was restored to its former supremacy. The profession of Christianity by any of the natives was prohibited, and violent persecution of the native Christians commenced, in which many suffered martyrdom with heroic fortitude. The French were expelled from their settlements on the E. coast by Radama in 1825, and again by the queen's troops in 1831. In 1845 the English and French cruisers in those seas undertook to humble the Hovas, and, after fruitless conferences and attempts at negotiation, bombarded and burned Tamatave, and landed to attack the fort, but were repulsed with considerable loss. From this period all amicable intercourse between the French and English and the Madagascans ceased for eight years, till in 1853 commercial relations were renewed by the payment of an indemnity to the queen of the island. In 1846 the queen's son, then 17 years of age, embraced Christianity, and through his influence Christian doctrines were more widely spread than ever; but in 1849 a fresh persecution broke out, and more than 2,000 persons were arrested and punished for their faith, some of them with death. In 1837 a conspiracy organized by French emissaries for the overthrow of the queen's government led to another persecution of the Christians, in which 2,000 persons were put to death. In 1861 Ranaivalona died, and was succeeded by her son Radama II., who proclaimed liberty to all religions, released the Christian captives, and forbade sorcery and the ordeal by poison. The English missionaries returned, and Christianity made rapid progress. On May 12, 1863, he was murdered and his widow Rasoherina made sovereign. She was a heathen, and the patron of the idols, but preserved liberty of worship. In 1867 a large church was erected in memory of the Christian martyrs. Rasoherina died April 1, 1868, and was succeeded by her sister, who took the name of Rasoherina II. She publicly professed Christianity on Feb. 20, 1869, and has exerted her influence for the advancement of education. Three printing presses are established at her capital, and during 1869 36,243 books were issued, and in the first six months of 1870 81,000 tracts, Bibles, Testaments, and other books. In 1871 about 150 schools were in

operation, attended by more than 6,000 pupils. The number of nominal Christians in Madagascar is estimated at 300,000, and with the favor of the sovereign and the higher classes it is rapidly increasing. About 60,000 are church members, most of them in connection with the London missionary society, and adopting congregational principles. In 1874 the church of England placed a bishop at the head of its mission there. The Wesleyans and Friends also support missionaries in the island. The number of Roman Catholics is estimated at 10,000.—The Madagascan language, or Malagasy, belongs to the Malayo-Polynesian family. (See MALAYO-POLYNESIAN RACES AND LANGUAGES.) There are several dialects, of which the Ankova dialect, spoken by the Hovas of the interior, the Betsimisaraka, spoken in the east, and the Sakalava, in the west and northwest of the island, are the most important and best known. The consonantal system is like that of the Malayan languages, with the exception of *t*, which is sounded somewhat like *tr*, and of *d*, which is generally changed into *ts* or *z*. A Malayan *k* is commonly replaced by *h*, and *y* by *z*; thus, Malay *kayu*, wood, is changed in Malagasy into *hazo*. There are no special case forms properly so called. The nominative is indicated by its position before the subject verb; the genitive either by prefixing the particles *na*, *ni* to the possessor, or by placing the thing possessed before the possessor or in conjunction with a possessive pronoun; the accusative is determined by its position only, and the other cases by placing before the noun certain particles mostly of an adverbial character. The construction of the singular and plural number is that peculiar to the Malayo-Polynesian family. The pure pronominal forms are *aho*, *izaho* for the first person singular, plural inclusive *isikia*, plural exclusive *isahay*; *hianao* for the second person singular, plural *hianareo*; and *izy* for the third person in both numbers. The pronominal suffixes are *-ko* for the first person singular, plural *-nay*; *-nao* for the second person singular, plural *-nareo*; and *-ny* for the third person in both numbers. A verb with *man* is transitive, with *mi* intransitive; as *manresse*, to conquer, *miresse*, to be conquered; *manhina*, to humble another, *mihina*, to humble oneself; and intransitives may commonly be used also in a passive sense. The particle *maka* gives to verbs a causative or potential meaning; as *mahateia*, to be capable of loving, *maha faty*, to make dead or kill. Verbs with *mana* suggest the continuance of an action; as *dia*, clean, *mandio*, to cleanse, *manadio*, to be cleaning. *Haro*, to mix, changes into *manaro* for the present, *naharo* for the preterite, and *hanaro* for the future active; and into *miharo* for the present, *niharo* for the preterite, and *hiharo* for the future passive. These tenses are formed by the addition of the particle *na*, which assimilates with the verb.—See the Rev. William Ellis, "History of

Madagascar" (2 vols., London, 1838), "Three Visits to Madagascar" (1858), and "The Martyr Church" (1870); Ida Pfeiffer, "A Visit to Madagascar" (London, 1861); L. McLeod, "Madagascar and its People" (London, 1865); S. P. Oliver, "Madagascar and the Malagasy" (London, 1866); and J. Sibree, "Madagascar and its People" (London, 1870).

**MADAME** (Fr. *ma* and *dame*, my lady), a French title, originally applied only to female saints and ladies of quality, but now extended to married women generally. Under the old French monarchy the daughters of the sovereign received this title at their birth, and were designated Madame Élisabeth, Madame Victoire, &c., the eldest only being called simply Madame. It applied more particularly perhaps to the wife of Monsieur, the king's eldest brother, or to the eldest daughter of the dauphin, by but one of whom, however, it could be borne at a time. The daughters of the king's younger sons and of his brothers and uncles were called Mesdemoiselles, the one taking precedence of the others in rank or birth being Mademoiselle.

**MADAWASKA**, the N. W. county of New Brunswick, Canada, formed in 1873 from a portion of Victoria co.; area, about 1,500 sq. m. It is watered by the Madawaska river and other affluents of the St. John, which separates it on the S. W. from Maine. The surface is rolling and varied; the soil is very fertile. Capital, Edmundston.

**MADDALONI**, a town of Italy, in the province of Caserta, 14 m. N. N. E. of Naples, with which it is connected by rail; pop. about 18,000. It is built around the base of a hill, two peaks of which are crowned with an old castle and the church of San Michele. It contains six churches, four convents, a college, a hospital, and the ancient palace of the dukes of Caraffa. There is a large aqueduct to Caserta. An important trade is carried on in wine and agricultural products. The town dates from the 9th century, and is supposed to occupy the ancient site of Suessula.

**MADDEN**, Sir Frederick, an English antiquary, born in Portsmouth in 1801, died in London, March 8, 1873. In 1825 he was employed to assist Mr. Roscoe in preparing a catalogue of the MSS. at Holkham, the property of the earl of Leicester of Holkham, and from 1826 to 1828 he was engaged in the British museum to assist in compiling the classed catalogue of printed books. He then became assistant keeper of the department of MSS., and in 1837 succeeded to the keepership. He became an editor of the *Collectanea Topographica et Geographica* in 1834. During his administration the department was considerably enlarged. In 1832 he was made by William IV. a knight of the Hanoverian order, and in 1834 he was gazetted as one of the gentlemen of the privy chamber. In 1866 he retired from his office in the British museum, and devoted himself to private literary research. He published many works re-

lating to literary antiquities; among them are editions of the romances of "Havelok the Dane" and "Sir Gawayne," the Saxon poem of "Layamon's Brut," Wycliffe's Bible, "The Privy Purse Expenses of the Princess Mary," and the letterpress to Shaw's "Illuminated Ornaments selected from MSS. and Early Printed Books." He also contributed many articles to the "Archæologia," among which one entitled "Observations on the Autograph of Shakespeare" attracted much attention, as supporting the authenticity of the celebrated autograph of the great poet found in a copy of a translation of Montaigne's "Essays."

**MADDEN**, Richard Robert, an Irish author, born in Dublin in 1798. In 1829 he became a fellow of the royal college of surgeons. From 1833 to 1847 he was employed in the civil service, especially in connection with the suppression of the slave trade, and as a commissioner he visited the United States, Jamaica, and Cuba. In 1847 he was colonial secretary of Western Australia; and since 1850 he has been secretary to the loan fund board in Dublin castle. His principal works are: "Travels in Turkey, Egypt, &c., in 1824-'7" (2 vols., London, 1829); "The Mussulman, a Tale" (3 vols., 1830); "The Infirmities of Genius" (2 vols., 1833); "A Twelvemonth's Residence in the West Indies" (2 vols., 1835); "The United Irishmen of 1798" (in 3 series, 2 vols. each, 1842, '3, '6); "Connection of the Kingdom of Ireland with the Crown of England" (1845); "Shrines and Sepulchres of the Old and New World" (1851); "The Life and Martyrdom of Savonarola" (1854); "Memoirs of the Countess of Blessington" (1855); "Phantasmata, or Illusions and Fanaticisms of an Epidemic Character" (1857); "The Turkish Empire in its Relations with Christianity and Civilization" (1860); "Galileo and the Inquisition" (1863); and "The History of Irish Periodical Literature" (1st series, 2 vols. 8vo, 1867).

**MADDER**, a plant (*rubia tinctorum*), the roots of which are employed as a red dye. It was known and used by the ancients, and a correct description of the plant is given by Dioscorides under the name of *ereuthodanon*. The plant belongs to the natural order *rubiaceæ*, is a native of the south of Europe, and is largely cultivated in France, Asia Minor, and Holland; experiments have been made in cultivating it in some parts of this country, but it has not yet found a place in our agriculture. The roots are perennial, and throw up annual slender, quadrangular, jointed stems, a few feet in length, and furnished with prickles, by which they are held in climbing upon other plants. The leaves are produced in whorls at the joints, at which point the branches are borne in pairs; the flowers are in clusters at the ends of the branches, have a rotate yellow corolla, and are succeeded by a small, globular, two-lobed, juicy berry. The roots, proceeding from a central head, are long succulent fibres. Those esteemed the best for dyers' use are from the size of a



goose quill to that of the little finger, and of the second or third year's growth. When stripped of the dark bark which covers them, they appear semi-transparent, are of a reddish color, and possess a bitter taste and a strong peculiar odor. The plants are propagated by shoots, which are planted in August about a foot apart, and left to grow for two years, being kept free from weeds. They are also raised from seed. When the roots are dug, they are dried in the air and in kilns, threshed with a flail to remove the cuticle, and several times winnowed and sifted with sieves of increasing fineness; the dust and sand which pass through the last sieve are rejected, and the fibrous portions which remain are further cleaned and assorted. The coarsest fibres are esteemed the best. They are again dried in stoves until they break easily when squeezed in the hand; and after this they are cut up by a machine furnished with knives, and then ground between



Madder (*Rubia tinctorum*).

millstones, and the powder is bolted. In commerce the powdered roots only are called madder, the whole roots being known by the name of *lizari*; the variety called *mulle* or *bilon* is of inferior quality, consisting of the fibres and epidermis of the larger roots, earthy impurities, and the refuse from the sieves. The best varieties are those from Bakir and other places in the vicinity of Sinope. At Smyrna, whither most of the Turkish product is brought for shipment, the roots are sorted and packed by means of hydraulic presses into bales of 6 to 7 cwt. each. The annual product varies with the prices, the growers refusing to dig the roots when the price is low, and when it is high they often take them up when they are only two years old. They should be in the ground three or four years, according to the sort. The European madders are distinguished as Dutch, Alsatian, and of Avignon, or of the Comtat. The qualities are very vari-

able. Many sorts are prepared without removal of the epidermis, and are consequently of darker hue than those denominated "stripped." The powders are improved by being kept from one to three years in the cask; they undergo in this time a process of fermentation, the particles agglomerating and expanding, often with sufficient force to cause the heads of the casks to swell out. The madder becomes so hard that it can be removed only by cutting it out with chisels.—In dyeing, the common reds employed for cottons are prepared from madder, and in calico printing this dye is particularly convenient on account of the variety of tints it affords when used with different mordants. The composition of madder is exceedingly complicated, from the great number of organic and inorganic substances it contains. (See ALIZARINE.)—Madder is often adulterated, sometimes with earthy substances, the presence of which is easily detected by the grittiness of the article when chewed; but more frequently with saw dust, as of pine bark, mahogany, logwood, &c., substances that seriously impair its qualities as a dye, and are very difficult of detection and separation. Hence, to judge of the value of samples of madder, it is necessary to submit them to actual trial upon pieces of cloth prepared with different mordants in order to determine their tinctorial power and peculiar hues.—A singular property possessed by madder was first noticed by John Belchier, an English surgeon, in 1736, and subsequently attracted much attention from physiologists, especially Haller and Hunter. He observed that the bones of pork served at table were of a red color, and on investigation traced the cause to the hogs having been fed on bran which had been boiled with printed calicoes in order to brighten their colors. It was afterward ascertained that the color of madder was very rapidly deposited on the external portion of bones of animals that partook of the dye in their food. No point of ossification in the system escaped its action. Pigeons soon exhibited a red circle round the iris of the eye, where in birds there exists a circle of minute osseous pieces. Flourens in 1839, by a series of experiments upon pigs fed alternately with food mixed with madder and food free from it, was led to very interesting conclusions as to the manner of growth and absorption of bones, the former resulting from external accretion, and the latter taking place on the inner surface, except in the teeth, in which the operations are reversed. The milk of cows that feed upon it is said to be tinged to a reddish color, which is imparted to the butter. But there is little ground for the opinion of Beckmann, that Virgil in his fourth Eclogue referred to madder under the name of *sandyx*, in the line: *Sponte sua sandyx pascentes vestiet agnos*, there being no authentic case recorded of either wool or hair made red by an introduction of madder in food.—East India madder, known also as *munjeet*, is the roots of *rubia munjistia*, a species

found in Bengal, Nepaul, &c.; it has different foliage from the common madder, and its roots are longer and thinner. The root is sent out in the whole state in bundles about 2 ft. long and the thickness of one's wrist. Its uses are the same as the common madder, but it is but little employed; the annual supply received in England from all sources is less than 100 tons.

**MADEIRA** (Port., wood), a Portuguese island in the Atlantic ocean, lying between lat. 32° 37' and 32° 52' N., and lon. 16° 38' and 17° 16' W.; greatest length from E. to W. 34 m., greatest breadth from N. to S. 14 m.; area, 311 sq. m.; pop. in 1871 reported at 118,379 (probably including the contiguous island of Porto Santo, the aggregate area and population of the two islands being set down in the census of 1869 at 317 sq. m. and 115,804). The number of inhabitants rapidly decreased after 1845, owing to the disease of the vine and the consequent decay of agricultural interests; in the decade ending with 1855 no fewer than 85,000 persons emigrated, the greater part of them to Surinam. Funchal is the capital and chief port, and the only town of any note. The coast line is remarkably regular, there being not a single indentation that can be called a bay. The island is almost exclusively a mass of basalt, and the surface is extremely irregular, rising abruptly from the north and south toward the interior, in a longitudinal ridge forming as it were the backbone of the island, with an elevation of from 2,000 to 4,000 ft. above the sea level, and surmounted here and there by jagged peaks and pyramids of rock of most picturesque appearance. The loftiest summits are for the most part off the line of the ridge; Pico Ruivo, the culminating point of the island, rises in the central portion and slightly northward; its height is 6,165 ft., and many of the adjacent peaks are little inferior. The mountain slopes on either side are furrowed by deep valleys, watered by limpid streams, covered with gardens and vineyards, the latter being formed on the rocky declivities to the height of more than 2,000 ft.; and the elevations separating the valleys come down abruptly to the coast and terminate in lofty headlands, or in bold precipices of basalt or crumbling tufa, so steep that soundings close along shore are scarcely found under 50 fathoms, save in the roadstead of Funchal, where the depth varies from 30 to 40 fathoms. At the E. extremity the hills taper to a narrow and comparatively low promontory of rock some 6 m. long, called Point São Lourenço, where is a calcareous sand with terrestrial shells of an extinct species, and calcareous infiltration resembling the roots and branches of trees. The most remarkable of the gorges or valleys is named the Curral das Freiras. A road encircles the island, leading now between tall cliffs, now along the brow of bold precipices overhanging the sea. From the mountains descend three small rivers in different directions, which, by means of arti-

ficial channels (*levadas*) and sluices, are so directed as to serve for irrigation.—The climate is one of the finest in the world, and so equable that for 18 years the mean annual temperature at Funchal, on the S. E. shore, did not vary from 68° F.; the extremes being 80° on the coast in the hottest months, August and September, and 63° in the coldest, December and January. The difference of temperature between day and night is likewise inconsiderable. Frequent rains at regular intervals throughout the year except from June to September, when it seldom rains, and light dews, add to the freshness and salubrity of the air, and produce a rich vegetation. Madeira is a favorite resort of consumptives, especially from England, the number of invalid visitors from that country being estimated at 300 annually, and their expenditure at \$100,000, affording the exclusive means of subsistence to many of the inhabitants. Of the benefit to be derived from a timely sojourn in Madeira by persons afflicted with pulmonary disorders and other affections of the respiratory organs, there is no doubt whatever; but the efficacy of the climate in cases of confirmed disease has been greatly exaggerated.—The soil is extremely fertile; but an unwise division of the land proved inimical to agricultural prosperity. Small holdings of from 10 to 50 acres, on the *métayer* plan, were let at a rent of half the produce, according to a yearly valuation of the crops; but at present the actual cultivators of the ground raise crops of sugar, vegetables, &c., on their own account, and are consequently more prosperous. Every spot of the island not encumbered by rocks is turned to account. The agriculture, however, is conducted in the primitive Portuguese manner, and with the rudest implements. Immense labor was expended in the erection of terrace walls to prevent the earth of the mountain slopes from being washed into the sea by the rains, and in the construction of the *levadas* already mentioned to conduct the water of the mountain streams to the cultivated lands. The water thus supplied is subject to a tax, and the supply regulated with great strictness. From the introduction of vines into Madeira in 1421, wine was until the middle of the present century the staple production and chief source of wealth of the island. The richest vine district was the valley of the Cama de Lobos, on the S. side, where grew the famous grape which gave the choice and rare Malmsey wine. This wine, the dry Madeira, the Sercial, and the *tinto*, constituted the four principal kinds; besides which there were several others of inferior quality. (See PORTUGAL, WINES OF.) The grapes, almost all white, ripen in the shade of trellises, where they are allowed to become half dry before being gathered. They all come, it is said, from stocks brought from Candia in 1445, and have in turn contributed to the vineyards of Constance at the Cape of Good Hope. Most of the wine growers are English; and the chief commerce is with

England, whose products are received into the island at one half of the usual duties. Many kinds of Canary wines and enormous quantities of wine manufactured in Europe are sold under the name of Madeira, which competition was in a degree instrumental in determining the decadence which reduced the insular production from 22,000 pipes in 1813 to 3,000 in 1844. The devastations of the *oidium*, however, reduced the islanders almost to absolute penury, and gave rise to a regular tide of emigration from the shores of Madeira to the West Indies and Guiana. The disease became apparent in 1851, diminished the production of juice, and at length nearly destroyed the vines themselves. The sulphur remedy was tried in 1857, and so successfully as to have produced a marked improvement in the vintage of 1861; since which time the favorable signs have continued in regard to both the quantity and the quality of the wine. Catawba and Isabella vines from the United States were used for grafting, and found productive of good, although no wine was obtained from the original stocks. The following statement shows the rapid decrease in the vintages from 1847 to 1855: 1847 to 1850, 16,000 to 17,000 pipes; 1851, 12,000; 1852, 1,000; 1853, 754; 1854, 187; 1855, 29. On the failure of the vine, the sugar cane, which had formerly been extensively cultivated, again became an object of care; and an attempt was made to employ in cochineal rearing as many as possible of the laborers who had been suddenly deprived of occupation. The cane, however, will not flourish in Madeira at a greater elevation than 1,000 ft. above the sea level; it grows best in the vicinity of Funchal and São Jorge. Coffee, which was plentifully produced, and of excellent quality, before the prosperous era of viticulture, has been almost totally abandoned; and numerous attempts to grow tobacco have been thwarted by the government, although its cultivation in the island has not been prohibited since 1864. Maize, for which the soil is peculiarly favorable, is grown in large quantities; as are also wheat, barley, arrowroot, potatoes, sweet potatoes, cabbage, onions, beans, and pumpkins. Among the fruits, besides the grape, are oranges, peaches, guavas, figs, mangos, pineapples, yams, pomegranates, custard apples, bananas, and nearly all the fruits of the temperate zone; walnuts and chestnuts growing in great abundance in the woods on the mountains, and forming an important article of food for the people. The island produces 80 or 90 indigenous plants, but the greater part of the flora resembles that of the Canary islands and of the Mediterranean basin. Hedges of geraniums, fuchsias, and heliotropes fringe the roads and narrow paths in every part of the island. The most remarkable forms of the native vegetation are the dragon tree and a species of cactus, the latter of which exists in great abundance in the lowlands. The aloe, agave, and hydrangea flourish in the elevated

regions; and heaths, pines, and brilliant flowering plants crown the loftiest summits. The laurels, of which there are four kinds, are also conspicuous; and the juniper attains the height of 50 ft., and yields a valuable aromatic wood. Madeira has no indigenous land mammals; the cattle, goats, horses, asses, rabbits, rats, and mice were introduced by the Portuguese. The horses are small, but active and hardy; they are used only for riding, oxen being employed for draught, and asses for carrying. The only bird peculiar to the island is a wren, but about 30 species breed there, among which are the kestrel, buzzard, and barn owl, the blackbird, redbreast, goldfinch, quail, partridge, woodcock, two kinds of swallows and three of pigeons, and the green Canary bird from which the domesticated species is derived. There are very few reptiles, and none poisonous; a small lizard is seen in hosts basking on the rocks. About 190 species of fish are found near the island, many of which are peculiar. Among them are the torpedo, the stag-horned horse fish, striped remora, flying fish, sword fish, trumpet fish, and several curious species of shark. About 1,200 species of insects have been enumerated, and about 119 species of shells have been found, most of which are peculiar to the island.—The people of Madeira are of mixed Portuguese, Moorish, and negro descent. The men are well formed and strong, with black hair and eyes; but the women are generally far from comely, though they have fine eyes and hair. The lower classes are gay, polite, respectful to their superiors, industrious, and capable of long continued labor; the upper classes are indolent; neither have much intellectual culture; the morals of both are extremely lax; and illegitimate children are numerous. The Portuguese, the language of the country, is spoken with little purity; and French and English are pretty commonly understood by the commercial classes and the hotel keepers. The manufactures are insignificant, consisting chiefly of baskets, straw hats, coarse linens and woollens, shoes, artificial flowers, sweetmeats, and some needlework embroidery.—The imports, which are mainly from Great Britain, consist of cotton, woolen, and linen fabrics, fancy and dress goods, hardware, breadstuffs, salt fish, and coal, the last mostly for the use of ocean steamers. The main article of export is wine, of which 49,413 gallons were sent to England in 1868, 53,667 in 1869, 71,590 in 1870, 86,800 in 1871, and 93,588 in 1872. The other articles of export are cochineal and embroidery and other needlework. The value of the exports to Great Britain for five years was as follows: 1868, \$264,465; 1869, \$269,965; 1870, \$283,735; 1871, \$456,680; 1872, \$419,095. The total value of the imports from Great Britain during the same period was: 1868, \$421,525; 1869, \$464,000; 1870, \$467,440; 1871, \$469,355; 1872, \$560,085. The total value of the exports and imports to all countries in 1872

was \$841,032 and \$1,504,953, respectively.—Madeira is divided into about 50 parishes, each of which has a church and a resident priest, under the jurisdiction of the see of Funchal. Although the Roman Catholic is the established religion, Protestants of foreign birth enjoy freedom of worship. About 800 natives who openly professed themselves Protestants were obliged to flee to the United States or Trinidad. There are primary and Sunday schools throughout the island; but not more than one eighth of the children are registered, and scarcely one third of these are in regular attendance. A law exists requiring parents to send their children to school after a certain age, but it has never been enforced.—Belonging to and about 11 m. S. E. of Madeira are three small, rocky, and uninhabited islands, called the Desertas, whither a few farmers repair to sow grain and to gather their meagre crops. The island of Porto Santo, about 25 m. N. E. of Madeira, is also dependent upon it. (See PORTO SANTO.)—There is a story that Madeira was accidentally discovered by an Englishman named Machin, about 1346; but the true discoverer is commonly admitted to be Gonçalves Zarco, who visited the island in 1419. A Portuguese colony was founded there in 1421; and Funchal, the capital, was incorporated as a city in 1508. From 1580 to 1640 Madeira, in common with Portugal, formed a part of the Spanish dominions. In July, 1801, an attack by the French being apprehended, the island was garrisoned with British troops under Col. Clinton; after the removal of which a second garrison, commanded by Commodore Hood and Major Beresford, landed in December, 1807, and held possession until the peace of 1814. It was seized by the partisans of Dom Miguel in August, 1828, and declared for Donna Maria in June, 1834. About 7,000 persons were carried off by cholera in 1856.

**MADEIRA**, or *Madera* (Port. and Span., wood), a river of South America, the largest of the affluents of the Amazon, formed by the united waters of the Beni and the Mamoré or Grande, which drain almost three fourths of the Bolivian territory, and of the Guaporé or Iténez, which flows through the auriferous plains of the Brazilian province of Matto Grosso. The Madeira proper begins at the confluence of the Mamoré and the Iténez, about lat. 12° S.; it receives the Beni on the left bank in lat. 10°, flows N. E., and falls into the Amazon midway between Manáos and Serpa, about lat. 3° 30' S., after a course of 750 m.; but its entire course is reckoned at 2,000 m. At its mouth it is 2 m. wide and 65 ft. deep; 500 m. up its width is 1 m. and its depth 100 ft.; and were it not for a series of 12 magnificent cataracts commencing some 480 m. from the Amazon, vessels of almost any size might sail up into the very heart of Bolivia. But a railway of about 150 m., traversing the bend of the river in which the falls are comprised, which was commenced in 1872 by an American engineer, Col. E. Church, is to connect the navigation

of the upper and lower Madeira. Traffic has hitherto been carried on by canoes 30 to 40 ft. long, which have to be lifted out of the water on nearing the successive cataracts. The river derives its name from the vast quantity of wood that floats down its stream, especially during and for a short time after the floods.

**MADISON**, the name of 19 counties in the United States. **I.** A central county of New York; area, 670 sq. m.; pop. in 1870, 43,522. Oneida lake is on the N. border, and Owahgena or Cazenovia lake on the W. Its principal streams are the Unadilla and Chenango rivers, and Chittanooga and Oneida creeks. The central and S. portions are hilly, the N. low and swampy. It is intersected by the New York Central and several other railroads. The Chenango canal passes through the S. E. part. The chief productions in 1870 were 160,155 bushels of wheat, 286,284 of Indian corn, 737,624 of oats, 153,016 of barley, 418,990 of potatoes, 53,575 lbs. of tobacco, 129,813 of wool, 3,232,925 of flax, 117,056 of maple sugar, 1,575,027 of butter, 280,776 of cheese, and 138,657 tons of hay. There were 10,084 horses, 36,088 milch cows, 12,847 other cattle, 24,926 sheep, and 9,094 swine; 9 manufactories of agricultural implements, 38 of carriages and wagons, 77 of cheese, 10 of cider, 1 of cotton goods, 12 of furniture, 9 of iron castings, 1 of distilled liquors, 7 of machinery, 6 of sash, doors, and blinds, 1 of silk goods, 4 of woollen goods, 3 ship building and repairing establishments, 27 flour mills, 25 saw mills, 19 tanneries, and 10 currying establishments. Capital, Morrisville. **II.** A N. county of Virginia, bounded N. W. by the Blue Ridge, and S. E., S., and S. W. by the Rapidan river; area, 276 sq. m.; pop. in 1870, 8,670, of whom 3,711 were colored. Robertson's and Hazel rivers have their sources in the county. The surface is elevated and noted for its fine scenery. In the valleys the soil is fertile. The chief productions in 1870 were 105,833 bushels of wheat, 240,240 of Indian corn, 54,884 of oats, 60,650 lbs. of tobacco, and 46,705 of butter. There were 1,597 horses, 1,739 milch cows, 3,100 other cattle, 3,026 sheep, and 6,215 swine. Capital, Madison Court House. **III.** A W. county of North Carolina, bordering on Tennessee, and intersected by French Broad river; area, about 450 sq. m.; pop. in 1870, 8,192, of whom 384 were colored. It has a hilly surface, lying on the S. E. declivity of Bald mountain. The chief productions in 1870 were 29,749 bushels of wheat, 167,971 of Indian corn, 19,108 of oats, 15,924 lbs. of tobacco, 12,007 of wool, and 65,675 of butter. There were 739 horses, 1,912 milch cows, 3,223 other cattle, 6,670 sheep, and 10,567 swine. Capital, Marshall. **IV.** A N. E. county of Georgia, drained by Broad river and branches; area, 275 sq. m.; pop. in 1870, 5,227, of whom 1,581 were colored. The surface is undulating, and the soil varies in fertility. It has some mineral springs, and contains gold, granite, and iron ore. The

chief productions in 1870 were 9,031 bushels of wheat, 49,523 of Indian corn, 732 bales of cotton, and 3,815 lbs. of wool. There were 2,101 sheep, 2,095 swine, and 5 flour mills. Capital, Danielsville. **V.** A N. county of Florida, bordering on Georgia, bounded E. by the Suwanee and Withlacoochee rivers, and W. by the Ocala; area, 800 sq. m.; pop. in 1870, 11,121, of whom 6,692 were colored. It is intersected by the Jacksonville, Pensacola, and Mobile railroad. The chief productions in 1870 were 161,105 bushels of Indian corn, 13,885 of sweet potatoes, 2,311 gallons of molasses, and 4,470 bales of cotton. There were 361 horses, 760 mules and asses, 1,904 milch cows, 7,074 other cattle, 1,371 sheep, and 5,055 swine; 6 flour mills and 5 saw mills. Capital, Madison. **VI.** A N. county of Alabama, bordering on Tennessee, bounded S. by the Tennessee river, and intersected by the Flint river; area, 760 sq. m.; pop. in 1870, 31,267, of whom 15,740 were colored. It has a hilly surface and a fertile and well cultivated soil. The Memphis and Charleston railroad passes through the county seat. The chief productions in 1870 were 36,878 bushels of wheat, 674,625 of Indian corn, 13,223 of oats, 10,386 of Irish and 22,437 of sweet potatoes, 78,373 lbs. of butter, 8,134 gallons of sorghum molasses, and 12,180 bales of cotton. There were 3,319 horses, 1,911 mules and asses, 3,385 milch cows, 770 working oxen, 4,033 other cattle, 4,062 sheep, and 17,824 swine; 6 manufactories of carriages and wagons, 2 of cotton goods, 2 flour mills, and 4 saw mills. Capital, Huntsville. **VII.** A central county of Mississippi, bounded W. by Big Black river, and S. E. by Pearl river; area, 720 sq. m.; pop. in 1870, 20,948, of whom 15,139 were colored. It is intersected by the New Orleans, Jackson, and Great Northern railroad. The chief productions in 1870 were 320,602 bushels of Indian corn, 45,623 of sweet potatoes, 77,588 lbs. of butter, and 19,269 bales of cotton. There were 1,817 horses, 2,862 mules and asses, 4,035 milch cows, 1,120 working oxen, 6,831 other cattle, 4,237 sheep, and 12,120 swine. Capital, Canton. **VIII.** A N. E. parish of Louisiana, bordered by the Mississippi river on the E. and intersected by the Tensas; area, 700 sq. m.; pop. in 1870, 8,600, of whom 7,663 were colored. It has a low surface and a fertile soil. The Northern Louisiana and Texas railroad passes through it. The chief productions in 1870 were 170,477 bushels of Indian corn, 12,964 of sweet potatoes, and 17,189 bales of cotton. There were 896 horses, 1,605 mules and asses, 756 milch cows, 539 other cattle, and 2,303 swine. Capital, Richmond. **IX.** An E. county of Texas, bounded E. by the Trinity river, and W. by the Navasoto; area, 336 sq. m.; pop. in 1870, 4,061, of whom 1,470 were colored. The surface is rolling, covered with pine and oak; the soil good in the bottoms, sandy elsewhere. The chief productions in 1870 were 84,006 bushels of Indian corn, 8,296 of sweet potatoes,

9,560 lbs. of wool, 21,430 of butter, and 2,729 bales of cotton. There were 2,233 horses, 3,186 milch cows, 16,603 other cattle, 5,264 sheep, and 9,896 swine. Capital, Madisonville. **X.** A N. W. county of Arkansas, drained by White river and its branches; area, about 800 sq. m.; pop. in 1870, 8,231, of whom 150 were colored. It has a diversified surface and fertile soil. The chief productions in 1870 were 68,779 bushels of wheat, 374,171 of Indian corn, 17,973 of oats, 23,059 of Irish and 10,763 of sweet potatoes, 14,080 lbs. of tobacco, 13,110 of wool, 160,187 of butter, and 14,291 gallons of sorghum molasses. There were 2,336 horses, 2,036 milch cows, 4,118 other cattle, 6,783 sheep, and 26,283 swine. Capital, Huntsville. **XI.** A W. county of Tennessee, watered by branches of the Forked Deer river; area, 265 sq. m.; pop. in 1870, 23,480, of whom 10,152 were colored. The surface is undulating and the soil fertile. It is intersected by the Mobile and Ohio and the Mississippi Central railroads. The chief productions in 1870 were 48,438 bushels of wheat, 692,910 of Indian corn, and 9,255 bales of cotton. There were 2,849 horses, 3,195 mules and asses, 3,931 milch cows, 6,843 other cattle, 3,558 sheep, and 31,906 swine; 4 tanneries, 12 flour mills, and 7 saw mills. Capital, Jackson. **XII.** A central county of Kentucky, bounded N. by the Kentucky river; area, 434 sq. m.; pop. in 1870, 19,543, of whom 6,272 were colored. It has an undulating surface and fertile soil. The Richmond branch of the Louisville and Nashville railroad terminates at the county seat. The chief productions in 1870 were 53,849 bushels of wheat, 49,271 of rye, 1,115,061 of Indian corn, 88,162 of oats, 39,439 of potatoes, 16,600 lbs. of tobacco, 26,757 of wool, 265,616 of butter, and 3,798 tons of hay. There were 6,957 horses, 4,287 mules and asses, 5,664 milch cows, 2,010 working oxen, 12,855 other cattle, 11,777 sheep, and 30,496 swine; 10 manufactories of carriages and wagons, 6 of saddlery and harness, 2 of woollen goods, 3 distilleries, 3 flour mills, and 4 saw mills. Capital, Richmond. **XIII.** A S. W. county of Ohio; area, 400 sq. m.; pop. in 1870, 15,633. It has a nearly level surface and a fertile soil. It is intersected by the Columbus, Springfield, and Cincinnati, and the Pittsburgh, Cincinnati, and St. Louis railroads. The chief productions in 1870 were 73,154 bushels of wheat, 1,164,121 of Indian corn, 73,741 of oats, 37,572 of potatoes, 348,114 lbs. of wool, 206,244 of butter, and 20,344 tons of hay. There were 6,626 horses, 3,462 milch cows, 13,085 other cattle, 70,810 sheep, and 23,570 swine. Capital, London. **XIV.** A central county of Indiana, drained by White river and its branches; area, 430 sq. m.; pop. in 1870, 22,770. It has an undulating surface and very fertile soil. It is intersected by the Cleveland, Columbus, Cincinnati, and Indianapolis, and the Pittsburgh, Cincinnati, and St. Louis railroads. The chief productions in 1870 were 541,669 bushels of



wheat, 1,028,150 of Indian corn, 74,673 of oats, 62,184 of potatoes, 73,457 lbs. of wool, 322,487 of butter, and 10,385 tons of hay. There were 7,677 horses, 5,145 milch cows, 7,737 other cattle, 22,820 sheep, and 29,885 swine; 11 manufactories of carriages, 1 of agricultural implements, 3 of cooperage, 7 of furniture, 7 of saddlery and harness, 2 of sash, doors, and blinds, 3 of woollen goods, 17 planing mills, and 6 flour mills. Capital, Anderson.

**XV.** A S. W. county of Illinois, bordered W. by the Mississippi; area, 760 sq. m.; pop. in 1870, 44,131. The surface is undulating and the soil very fertile. The Chicago and Alton and several other railroads pass through it. The chief productions in 1870 were 1,207,731 bushels of wheat, 2,127,540 of Indian corn, 474,262 of oats, 667,460 of potatoes, 24,899 lbs. of wool, 288,988 of butter, and 26,088 tons of hay. There were 12,194 horses, 3,070 mules and asses, 7,734 milch cows, 6,145 other cattle, 8,627 sheep, and 52,480 swine; 9 manufactories of agricultural implements, 1 of bells, 28 of carriages, 19 of cooperage, 14 of furniture, 1 of window glass, 3 of iron castings, 2 of lime, 2 of machinery, 23 of saddlery and harness, 3 of sash, doors, and blinds, 13 of tin, copper, and sheet-iron ware, 3 of tobacco and snuff, 2 of woollen goods, 6 breweries, 7 saw mills, and 17 flour mills. Capital, Edwardsville.

**XVI.** A S. W. county of Iowa, drained by North and Middle rivers, tributaries of the Des Moines, and by a branch of Middle river; area, 396 sq. m.; pop. in 1870, 13,884. It has an undulating surface and fertile soil. The Chicago, Rock Island, and Pacific railroad skirts the N. part, and the Winterset branch terminates at the county seat. The chief productions in 1870 were 358,031 bushels of wheat, 1,453,684 of Indian corn, 140,639 of oats, 62,231 of potatoes, 71,999 lbs. of wool, 302,835 of butter, and 20,758 tons of hay. There were 5,459 horses, 4,337 milch cows, 7,903 other cattle, 20,183 sheep, and 19,185 swine; 1 woollen mill, 4 flour mills, and 9 lumber mills. Capital, Winterset.

**XVII.** A S. E. county of Missouri, drained by St. Francis and Castor rivers; area, about 550 sq. m.; pop. in 1870, 5,849, of whom 159 were colored. The soil is moderately fertile. Very fine iron and lead ores abound. The St. Louis and Iron Mountain railroad passes through it. The chief productions in 1870 were 11,431 bushels of wheat, 155,352 of Indian corn, 45,156 of oats, 8,949 of potatoes, 17,887 lbs. of tobacco, 7,869 of wool, 42,419 of butter, and 1,298 tons of hay. There were 1,101 horses, 1,014 milch cows, 2,195 other cattle, 4,108 sheep, and 7,358 swine. Capital, Frederick.

**XVIII.** A N. E. county of Nebraska, intersected in the N. part by the Elkhorn river; area, 576 sq. m.; pop. in 1870, 1,133. The surface is undulating and the soil fertile. The chief productions in 1870 were 24,929 bushels of wheat, 8,105 of Indian corn, 15,330 of oats, 3,907 of potatoes, 15,180 lbs. of butter, and

1,662 tons of hay. There were 209 horses, 194 milch cows, 514 other cattle, 317 sheep, and 251 swine. Capital, Norfolk.

**XIX.** A S. W. county of Montana, bordering on Idaho, from which it is separated by the Rocky mountains; area, 5,100 sq. m.; pop. in 1870, 2,684, of whom 299 were Chinese. It is watered by Jefferson and Madison rivers, and is one of the best agricultural counties of the territory. Gold is abundant, and the census of 1870 returns 33 mines as in operation, of which 15 were hydraulic, 10 placer, and 8 quartz. The chief productions were 10,764 bushels of wheat, 15,768 of oats, 11,130 of barley, 17,065 of potatoes, 28,470 lbs. of butter, and 1,449 tons of hay. There were 776 horses, 1,216 milch cows, 4,155 other cattle, and 375 sheep; 1 flour mill, 3 saw mills, and 12 quartz mills. Capital, Virginia City, the capital of the territory.

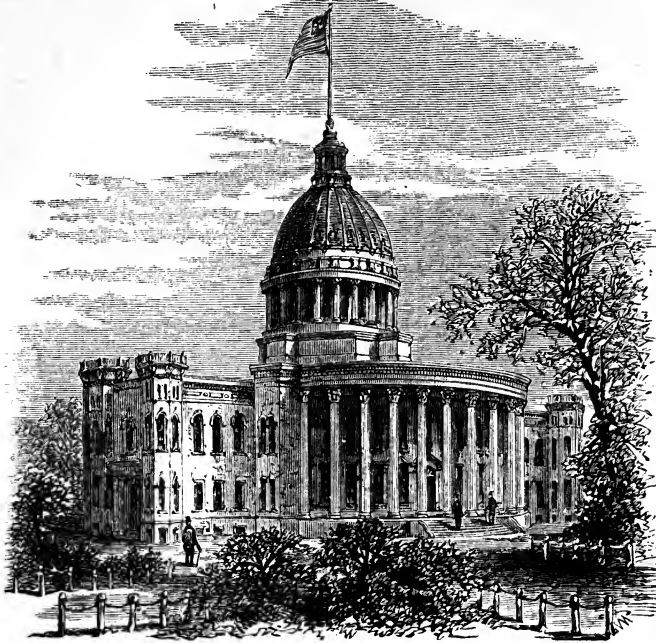
**MADISON**, a city of Wisconsin, capital of the state and of Dane co., situated in lat. 43° 4' N., lon. 89° 23' W., 75 m. W. of Milwaukee; pop. in 1850, 1,525; in 1860, 6,611; in 1870, 9,176, of whom 3,114 were foreigners. It is built in the midst of the "Four Lake region," so called from a chain of beautiful lakes which extend over a distance of 16 m. and discharge their surplus waters into Yahara or Catfish river, a tributary of Rock river. Mendota or Fourth lake, the uppermost and largest, is 9 m. long, 6 m. wide, and from 50 to 70 ft. deep in some places, and fed chiefly by springs; it has beautiful white gravelly shores and pure cold water. Monona or Third lake is 5½ m. long and 2 m. wide, and Lakes Waubesa and Kegonsa are each about 3 m. in length by 2 m. in width. The city of Madison occupies an undulating isthmus between Lakes Mendota and Monona, and in point of situation and scenery is the most beautiful city in the west. It is about 3 m. in length and 1 m. in breadth, and has wide, straight, and regular streets, with many beautiful buildings. The capitol, placed in the centre of a square park of 14 acres wooded with native timber, is built of limestone, and commands a fine view. It has recently been enlarged and improved at a cost of about \$550,000. The length of the N. and S. wings is 228 ft., and of the E. and W. 226 ft. The height from the basement to the top of the dome is about 200 ft. The court house and jail are situated near the S. corner of the park. The university of Wisconsin, with four buildings, stands on a picturesque eminence a mile W. of the capitol, and 125 ft. above the lakes. (See WISCONSIN.) The soldiers' orphans' home stands on the shore of Lake Monona, about a mile from the park. The building of the state hospital for the insane, 569 ft. long, on the N. shore of Lake Mendota, 4 m. N. of the capitol, is surrounded by grounds containing 393 acres, partly wood and farming land, and partly laid out and adorned. There is a United States court-house and post-office building, which cost about \$400,000. Madison has railroad communication with Chicago, Milwaukee, Green Bay, St. Paul,

and other points, by means of the Chicago and Northwestern and the Chicago, Milwaukee, and St. Paul lines. It is surrounded by a fertile

an aqueduct. Steamers ply daily to Cincinnati and Louisville. Madison contains several pork-packing establishments, and has an important

trade in provisions. There are also brass and iron foundries, flouring mills, planing mills, tanneries, breweries, machine shops, &c. The banking capital amounts to \$650,000, distributed between two national banks and one state bank. There are graded public schools, including a high school, a library of 4,000 volumes, a daily, a semi-weekly, and two weekly newspapers, and 15 churches. Madison was first settled in 1808.

**MADISON, I.** A post village of Chatham township, Morris co., New Jersey, on the Morris and Essex division of the Delaware, Lackawanna, and Western railroad, 24 m. W. of New York; pop. about 3,000. It is the seat of Drew theological seminary, chartered in 1866, and organized in 1867. This institution was founded by the Methodists, and



State Capitol of Wisconsin.

country, has an important trade, and contains manufactories of carriages and wagons, furniture, agricultural implements, woollen goods, saddlery and harness, flour, ale and beer, iron ware, &c. There are a state bank, a national bank, two savings banks, graded public schools, including a high school, two daily, one tri-weekly, and five weekly (two German) newspapers, and 14 churches. The principal libraries are the following: state historical society, 57,254 volumes; state, 7,500; university and societies, 6,830; Madison institute, 3,500; state agricultural society, 1,000.—Madison was selected as the territorial capital in 1836, while yet a wilderness, and in the following year the building of the capitol was commenced.

**MADISON**, a city and the county seat of Jefferson co., Indiana, on the Ohio river, 90 m. below Cincinnati and 44 m. above Louisville, and at the terminus of the Madison division of the Jeffersonville, Madison, and Indianapolis railroad, 85 m. S. S. E. of Indianapolis; pop. in 1850, 8,012; in 1860, 8,130; in 1870, 10,709, of whom 2,194 were foreigners. It is beautifully situated, at an elevation secure from floods, in a valley about 3 m. long, enclosed on the north by a range of hills 400 ft. high. The streets are regularly laid out, and a large proportion of the houses are built of brick. It is lighted with gas and supplied with water by

named in honor of Daniel Drew of New York, who gave \$250,000 for its establishment, which sum has been increased by successive donations to nearly \$1,000,000. The grounds comprise 95 acres, the greater portion of which is handsomely laid out with walks and drives, and adorned with trees and shrubbery. The three seminary buildings are situated near the centre, and are flanked on either hand by the professors' residences. The number of professors and instructors in 1873-'4 was 8, besides several lecturers; number of students, 104, of whom 28 were in introductory classes and 15 in special courses; volumes in the library, 10,000; alumni, 54. The regular course comprises three years. The introductory course is two years, corresponding to the freshman and sophomore years of most colleges. **II.** A post village and the capital of Morgan co., Georgia, on the Georgia railroad, 60 m. E. by S. of Atlanta, and 175 m. N. W. of Savannah; pop. in 1870, 1,389, of whom 770 were colored. It is pleasantly situated in the midst of a fertile country, from which it derives an active trade. It has a weekly newspaper, and is the seat of the Georgia female college (Baptist), established in 1850, which in 1873 had 5 instructors and 58 students.

**MADISON, James**, an American bishop, second cousin of President Madison, born in Rock-

ingham co., Va., Aug. 27, 1749, died March 6, 1812. He graduated at William and Mary college in 1772, and in 1773 became professor of mathematics in the college, and studied theology. In 1775 he went to England, and was admitted to orders by the bishop of London. From 1777 till his death he was president of William and Mary college, and from 1784 also professor of natural, moral, and political philosophy. Dr. Griffith, who had been chosen as the first bishop of Virginia, having declined, Dr. Madison was selected for the office, and was consecrated by the archbishop of Canterbury, at Lambeth palace, Sept. 19, 1790. He published several addresses and sermons, including one on the death of Washington (1800), and several scientific papers in "Barton's Journal" and the "Transactions of the American Society."

**MADISON, James**, fourth president of the United States, born at King George, Va., March 16, 1751, died at his seat of Montpelier, near Orange Court House, Va., June 28, 1836. His father was James Madison of Orange, a planter of ample means and high standing, descended from John Madison, an Englishman who settled in Virginia about the year 1653. The maiden name of his mother was Eleanor Conway. He was the eldest of seven children. After receiving a good preliminary education, he was sent in 1769 to the college at Princeton, N. J., where he graduated in 1771; but he remained there until the spring of 1772, pursuing a course of reading under Dr. Witherspoon, the president. His habits of application were so close at this period, that his health became seriously affected, and seems never to have been fully restored. In 1772 he returned to Virginia, and commenced a course of legal study, with which he mingled a large amount of miscellaneous reading and study in theology, philosophy, and belles-lettres. His attention was particularly directed to the first, and he thoroughly explored all the evidences of the Christian religion. From these pursuits he was soon diverted by public affairs. In the local contest for religious toleration, Madison distinguished himself by his zeal and activity in defence of the Baptists particularly, who with other non-conformists had been subjected to violent persecutions. In the spring of 1776 he was elected a member of the Virginia convention from the county of Orange, and procured the passage of the substance of an amendment to the declaration of rights by George Mason, which struck out the old term toleration and inserted a broader exposition of religious rights. In the same year he was a member of the general assembly, but lost his election in 1777, from his refusal to treat the voters, and the general want of confidence in his powers of oratory. The legislature, however, on meeting in November of the same year, elected him a member of the council of state; and in the winter of 1779 he was chosen by the assembly a delegate to congress. He took his seat in March, 1780, and remained in that body for three

years. He strongly opposed the issue of paper money by the states, and was in favor of a formal recommendation on the part of congress against the continuance of the system. As chairman of the committee to prepare instructions to the ministers at Versailles and Madrid, in support of the claims of the confederacy to western territory and the free navigation of the Mississippi, he drew up an elaborate and able paper, which was unanimously adopted by congress. He zealously advocated in 1783 the measures proposed to establish a system of general revenue to pay the expenses of the war, and as chairman of the committee to which the subject was referred prepared an able address to the state in support of the plan, which was adopted by congress, and received the warm approval of Washington. A striking proof of the value which the people of Virginia attached to his services is exhibited by the fact that the law rendering him ineligible after three years' service in congress was repealed, in order that he might sit during a fourth. On his return to Virginia he was elected to the legislature, and took his seat in 1784. In this body he inaugurated the measures relating to a thorough revision of the old statutes, and supported the bills introduced by the revisers, Jefferson, Wythe, and Pendleton, on the subject of entails, primogeniture, and religious freedom. He aided in the separation of Kentucky from Virginia and the formation of the new state, opposed the further issue of paper money, and favored the payment of debts due to British creditors. His greatest service at this time was the preparation, after the adjournment of the assembly, of a "Memorial and Remonstrance" against the project of a general assessment for the support of religion, which caused the complete defeat of the measure against which it was directed. In January, 1786, he obtained the passage of a resolution by the general assembly, inviting the other states to appoint commissioners to meet at Annapolis, and devise a new system of commercial regulations. He was chosen one of the commissioners, and attended at Annapolis in September of the same year. Five states only were represented, and the commissioners recommended a convention of delegates from all the states to be held at Philadelphia in May, 1787. The recommendation was generally adopted, and Madison was chosen one of the delegates from Virginia. The convention assembled, and the result was the abrogation of the old articles, and the formation of the constitution of the United States. Madison was prominent in advocating the constitution, and took a leading part in the debates, of which he kept private notes, since published by order of congress. His views in regard to the federal government are set forth at length in a paper still extant in the handwriting of Washington, which contains the substance of a letter written to Washington by Madison before the meeting

of the convention, proposing a scheme of thorough centralization. The writer declares that he is equally opposed to "the individual independence of the states" and to "the consolidation of the whole into one simple republic." He is nevertheless in favor of investing congress with power to exercise "a negative in all cases whatever on the legislative acts of the states, as heretofore exercised by the kingly prerogative." He says further that "the right of coercion should be expressly declared; . . . but the difficulty and awkwardness of operating by force on the collective will of a state, render it particularly desirable that the necessity of it should be precluded." From these extreme views Madison afterward conscientiously departed, but in the convention he supported them with zeal and vigor. The scheme known as the "Virginia plan" was adopted instead, and the convention adjourned. The subsequent adoption of the constitution was in large measure brought about by a series of essays now familiar, in their collected form, as "The Federalist." They were commenced in a New York newspaper soon after the adjournment of the convention, and continued to appear until June, 1788. The public journals everywhere republished them, and it was soon known that they were the work of Hamilton, Madison, and Jay. The volume remains the most forcible exposition upon the side which it espoused. The whole ground is surveyed generally and in detail; the various points at issue are discussed with the utmost acuteness, and the advantages of the adoption of the instrument urged with a logical force and eloquence which place the "Federalist" beside the most famous political writings of the old English worthies. The Virginia convention assembled in June, and Madison was a member of it. He had completely overcome his natural diffidence, and, although deficient as an orator, exerted a powerful influence over his associates, and contributed to the final triumph of the constitution as much as any one in the body. The instrument was adopted by a vote of 89 to 79, and the convention rose. The part which he had taken in its deliberations very greatly increased Madison's reputation; and he was brought forward as a candidate for United States senator, but was defeated. He was however chosen a representative in congress, and took his seat in that body in April, 1789. Alexander Hamilton was at the head of the treasury department, and Madison was obliged either to support the great series of financial measures initiated by the secretary, or distinctly abandon his former associate, and range himself on the side of the republican opposition. He adopted the latter course. Although he had warmly espoused the adoption of the constitution, he was now convinced of the necessity of a strict construction of the powers which it conferred upon the general government. He accordingly opposed the funding bill, the national bank, and Hamilton's system

of finance generally. His affection for Washington and long friendship for Hamilton rendered such a step peculiarly disagreeable to a man of Madison's amiable and kindly disposition. But the tone of his opposition did not alienate his friends. Occupying middle ground between the violent partisans on both sides, he labored to reconcile and harmonize the antagonism of the two parties. He always retained the cordial regard of Washington. On Jefferson's return from France, Madison was solicited to accept the mission, and it was kept open awaiting his decision for twelve months. He declined the place, as he afterward did the office of secretary of state on the retirement of Jefferson, from a conviction that the radical antagonism of views between himself and the majority in the cabinet would render his acceptance of either office fruitful in misunderstandings and collisions. He remained in congress, became thoroughly identified with the republicans, and in 1792 was the avowed leader of the party in congress. In 1794 he gave his full support to its foreign policy by moving a series of resolutions, based upon the report of Jefferson, advocating a retaliatory policy toward Great Britain, and commercial discriminations in favor of France. These resolutions he supported in a speech of great ability. In March, 1797, his term expired, and he returned to Virginia. The insulting treatment of the American envoys to France, and the war message of President Adams, were about to be followed by the passage of the alien and sedition laws. The republicans vainly tried to stem the popular current in favor of the measures of the administration. The passing of the alien and sedition laws in July, 1798, gave them the first opportunity to make a stand. Opposition to even these violent measures was however ineffectual in the federal legislature; and the republican leaders determined to resort to the state arenas for the decisive struggle. It commenced in Kentucky, and resulted there in the adoption of a series of resolutions, which were followed, in December, 1798, by similar resolves of the Virginia assembly. The latter, now known as "the resolutions of 1798-'9," were drawn up by James Madison, not then a member. They declared the determination of the assembly to defend the constitutions of the United States and of the states, but to resist all attempts to enlarge the authority of the federal compact by forced constructions of general clauses, as tending to consolidation, the destruction of the liberties of the states, and finally to a monarchy. In case of a "deliberate, palpable, and dangerous" exercise of powers not clearly granted to the general government, the states had a right to interpose; and as the passing of the alien and sedition laws was such an infringement of right, the assembly protested against those laws. The seventh resolution called upon other states to join with the state of Virginia "in declaring, as it does hereby declare, that

the acts aforesaid are unconstitutional, and that the necessary and proper measures will be taken by each for cooperating with this state in maintaining unimpaired the authorities, rights, and liberties reserved to the states respectively, or to the people." The resolutions passed the house by a vote of 100 to 63, and were duly communicated to the several states of the Union. They met with little favor, especially in the northern states. Massachusetts and New England generally remonstrated against them, and declared the obnoxious laws both constitutional and expedient. This drew forth, in the winter of 1799-1800, Madison's "Report" in defence of his resolutions. This elaborate paper subjected the resolves to an exhaustive analysis, and defended them with masterly vigor. It is the most famous of his political writings, and will rank with the greatest state papers written in America. Although the resolutions met with an unfavorable response from the other states, they exerted a powerful influence upon public opinion. Virginia had shown how deeply in earnest she was by directing the establishment of two arsenals, and an armory sufficiently large to store 10,000 muskets and other arms; but a wholesome change in the sentiment of the country happily restored good feeling, and softened down all bitterness. The alien and sedition laws found few supporters ultimately, and Madison's views were fully vindicated. The revulsion against the federal party and in favor of the republicans terminated in the election of Jefferson, who entered upon the presidency in 1801. Madison was secretary of state during Jefferson's entire administration, and his opinions upon public affairs closely agreed with the views of the president. He became still more popular with and acceptable to his party, and toward the end of Jefferson's second term was generally spoken of for the presidency. A caucus was finally held of the majority of the republican members of congress, and Madison was nominated. This met with bitter opposition from a wing of the party, headed by John Randolph, who were friendly to the election of Monroe. They published a caustic "Protest" against the action of the caucus, and denounced Madison for his "want of energy," his connection with the "Federalist," and his report upon the Yazoo claims. His friends defended him against all the charges, and retorted so strongly upon the authors of the protest that they were silenced. The action of the caucus was approved by the party generally, and Madison was elected by a vote of 122 out of 175, and took his seat as president, March 4, 1809. The members of his cabinet were: secretary of state, Robert Smith of Maryland, succeeded by James Monroe of Virginia, April 2, 1811; secretary of the treasury, Albert Gallatin of Pennsylvania till Feb. 9, 1814, George W. Campbell of Tennessee till Oct. 6, 1814, afterward Alexander J. Dallas of Pennsylvania; secretary of war, William Eustis of Massachu-

setts till Jan. 13, 1813, and William H. Crawford of Georgia from March 3, 1815, James Monroe acting in the interim; secretary of the navy, Paul Hamilton of South Carolina till Jan. 12, 1813, William Jones of Pennsylvania till Dec. 17, 1814, afterward Benjamin W. Crowninshield of Massachusetts; postmaster general, Gideon Granger of New York, succeeded by Return J. Meigs of Ohio, March 17, 1814; attorney general, Cæsar A. Rodney of Delaware till Dec. 11, 1811, William Pinkney of Maryland till Feb. 10, 1814, afterward Richard Rush of Pennsylvania.—President Madison entered upon his duties at a crisis in public affairs which required the utmost foresight, resolution, and prudence. Great Britain and the United States were on the verge of war. In 1807 the long series of wrongs inflicted by England upon the commerce of America, and the rights of her seamen, had been consummated by the affair of the Leopard and Chesapeake. This wanton insult had thrown the country into violent commotion, and occasioned the embargo, which had been succeeded by the non-intercourse act, prohibiting all commerce with France or England until the decrees of the French emperor and the British orders in council in relation to the seizure of neutrals and the impressment of seamen were repealed. The first act of the British cabinet did not encourage hopes of peace. Mr. Erskine, the English minister, in promising reparation for the affair of the Chesapeake and a repeal of the obnoxious orders in council, on condition of a renewal of intercourse on the part of the United States, was declared to have exceeded his authority, and was recalled. He was succeeded by Mr. Jackson, who was authorized to enter into negotiations for a commercial treaty, but who speedily became embroiled with the secretary of state. The president directed the secretary to receive no further communications from him, and soon afterward requested his recall. This was complied with, but no censure was visited upon the envoy, and no other was sent in his place. In May, 1810, congress approved the course of the executive, declared the official communications of Mr. Jackson highly indecorous and insolent, and passed a new act of non-intercourse. This provided that if either France or England repealed her hostile decrees, and the other did not within three months do likewise, then intercourse should be renewed with the one, while with the other non-intercourse should be persisted in. In August the French minister for foreign affairs gave notice to the American minister that the Berlin and Milan decrees had been revoked by the emperor; and in November Madison issued his proclamation, declaring the fact, and announcing that the act of non-intercourse would be revived as to Great Britain unless her orders in council should be revoked within three months from the date of the proclamation. The British government resisted



this demand, on the ground that there was no official evidence of the repeal of the French decrees, and the act of non-intercourse was accordingly declared in full force against Great Britain. In March, 1811, the emperor Napoleon disavowed the statement of the duke of Cadore, and declared that "the decrees of Berlin and Milan were the fundamental laws of the empire." American vessels had been seized and sequestered by France even after the president's proclamation, and every overture on the part of the American minister at Paris toward the reestablishment of friendly relations between the two countries was viewed with indifference, and completely failed. The country was slowly but surely drifting toward a war, which no exertions on the part of the administration seemed adequate to prevent. Madison pushed his pacific views to an extent which proved displeasing to many of the most prominent of the republican party. Bills were passed for augmenting the army, repairing and equipping ships of war, organizing and arming the militia, and placing the country in an attitude to resist an enemy; for all which congress appropriated \$1,000,000. Madison acquiesced in this policy with extreme reluctance, but on June 1, 1812, transmitted a special message to congress in which he reviewed the whole controversy, and spoke in strong terms of the aggressions of Great Britain upon commercial rights. The act declaring war between Great Britain and the United States speedily followed. The president gave it his approval on June 18, and promptly issued his proclamation calling upon the people to prepare for the conflict, and to support the government. A short delay would probably have defeated the policy of the war party, and reopened the old negotiations. A decree of the French emperor had been exhibited to the United States minister to France, dated April 28, 1811, which declared the definite revocation of the Berlin and Milan decrees, from and after Nov. 1, 1810. In consequence of this, Great Britain, on June 23, within five days after the declaration of war, repealed the obnoxious orders in council in relation to the rights of neutrals, and thus removed one of the great grounds of complaint on the part of the American government. On June 26, before the course of the British cabinet was known in America, Mr. Monroe, secretary of state, wrote to Mr. Russell, proposing the terms of an armistice. These were a repeal of the orders in council, with no illegal blockades substituted, and a discontinuance of the impressment of seamen. In the latter part of August Mr. Russell, United States chargé d'affaires at London, received from the English government a definite refusal to accede to these propositions as "on various grounds absolutely inadmissible," and thereupon returned to the United States. In September Admiral Warren arrived at Halifax. In addition to his

naval command, he was invested with powers to negotiate a provisional accommodation with the United States government. A correspondence on the subject ensued between himself and Mr. Monroe, as the representatives of the two countries. The admiral proposed an immediate cessation of hostilities, with a view to the peaceful arrangement of the points at issue. Monroe replied that his government was willing to accede to this proposition, provided Warren was authorized and would agree to negotiate terms for suspending in future the impressment of American seamen. The British government refused to relinquish the claim, and nothing remained but war.—On March 4, 1813, Madison entered upon his second term of service. He had received 128 electoral votes; his opponent, De Witt Clinton, 89 votes. The congressional elections had resulted in a large majority in favor of the administration, and the war policy thus appeared to be acceptable to the great body of the people, though a strong party were opposed to it, and endeavored to obstruct the measures necessary for the prosecution of hostilities. The contest commenced in earnest with the appearance, in February, 1813, of a British fleet in the Chesapeake bay; and in March the whole coast of the United States, with the exception of Rhode Island, Massachusetts, and New Hampshire, was declared in a state of blockade. The long series of engagements on land and water, during the war which followed, find their proper place in the general history of the country. In March, 1813, soon after the commencement of hostilities, the Russian minister to the United States communicated to the American government a proposal from the emperor Alexander to mediate between the belligerents. The proposition was accepted, and the president appointed commissioners to go to St. Petersburg, to negotiate under the mediation of the emperor. Great Britain declined the Russian mediation in September; but in November the American government was informed that that power was prepared to negotiate the terms of a treaty of peace. Steps were at once taken to meet this proposal. Mr. Clay and Mr. Russell were added to the commission previously appointed, and in January, 1814, joined their associates in Europe. In August of the same year the country was deeply aroused by the attack upon the capital. A British force of 5,000 men ascended the Chesapeake, landed on the shores of the Patuxent, and marched on Washington. The few troops hastily called together were wholly unable to offer any effective resistance, and retired before the enemy, who proceeded to the city, burned the capitol, the president's house, and other public buildings, and returned without loss to their ships. The president and several members of his cabinet were in the American camp, but were compelled to abandon the city in order to avoid capture. The enemy gained little by their movement, and

the wanton outrage only increased the bitterness of the people. Among the public occurrences of the year 1814, the meeting of the Hartford convention, in opposition to the continuance of the war, occupies a prominent place. (See HARTFORD CONVENTION.) The victory at New Orleans, however, and the intelligence of the conclusion of peace, terminated the popular agitation. A treaty of peace had been signed by the United States commissioners at Ghent on Dec. 24, 1814, and being communicated by the president to the senate, was ratified by that body in February, 1815. It was silent on the paramount question of the right of impressment, and left the commercial regulations between the two countries for subsequent negotiation. But the country was tired of the war, and the treaty was hailed with acclamation. In this general joy no one shared more sincerely than Madison. He had acquiesced reluctantly in the commencement of hostilities, and had longed for the conclusion of peace. The country came out of a war which cost her 30,000 lives and \$100,000,000 stronger and more honored than before, thoroughly convinced of her own power and resources, and regarded with increased respect by all the nations of the world. In 1815 a commercial treaty was concluded with Great Britain, based upon a policy of perfect reciprocity. The subjects of impressment and blockades were not embraced in it. The return of peace disbanded the organized opposition to the administration, and the remainder of Madison's term of office was undisturbed by exciting events. In April, 1816, congress incorporated a national bank with a capital of \$35,000,000, to continue for 20 years. The president had vetoed a similar bill in January of the preceding year, but now approved of it, from a conviction that the derangement of the currency made it necessary. It encountered strong opposition, but was supported by Mr. Clay and other friends of the administration, and passed both houses. In December, 1816, Madison sent in his last annual message to congress. Its recommendations were considered liberal and judicious, and secured the general approbation of the country.—On March 4, 1817, his long official connection with the affairs of the nation terminated, and he retired to his farm of Montpelier in Virginia. In this pleasant retreat he passed his days tranquilly in agricultural pursuits. He had married in 1794 Mrs. Todd, a Virginia lady, the widow of a distinguished lawyer of Philadelphia; and though their union had not been blessed with children, this amiable and accomplished woman's faithful devotion was a source of the greatest happiness to him. She survived him, dying at Washington, July 12, 1849, at the age of 82. During these years, in spite of his infirm health, Madison still busied himself in services to his neighbors and the commonwealth. He was chosen president of the county agricultural society, and for a long time act-

ed as visitor and rector of the university of Virginia. In 1829 he sat in the Virginia convention to reform the old constitution. When Madison rose to utter a few words, the members left their seats and crowded around the venerable figure, dressed in black, with his thin gray hair still powdered as in former times, to catch the low whisper of his voice. This was his last appearance in public.—If not endowed with the very first order of ability, Madison's mind was symmetrical and vigorous. An un-failing accuracy and precision marked the operation of his faculties. He was naturally deficient in powers of oratory, and yet made himself one of the most effective public speakers of his time, although the epoch was illustrated in Virginia by such men as Patrick Henry, Richard Henry Lee, George Mason, and Edmund Pendleton. Jefferson's testimony on this point is strong. "Mr. Madison," he says, "came into the house in 1776, a new member and young; which circumstances, concurring with his extreme modesty, prevented his venturing himself in debate before his removal to the council of state in November, 1777. From thence he went to congress, then consisting of few members. Trained in these successive schools, he acquired a habit of self-possession, which placed at ready command the rich resources of his luminous and discriminating mind and of his extensive information, and rendered him the first of every assembly afterward of which he became a member. Never wandering from his subject into vain declamation, but pursuing it closely, in language pure, classical, and copious, soothing always the feelings of his adversaries by civilities and softness of expression, he rose to the eminent station which he held in the great national convention of 1787; and in that of Virginia which followed, he sustained the new constitution in all its parts, bearing off the palm against the logic of George Mason and the fervid declamation of Mr. Henry. With these consummate powers was united a pure and spotless virtue, which no calumny has ever attempted to sully." From his earliest years Madison was a hard student. His memory was singularly tenacious, and what he once clearly discerned became assimilated, and was ever after retained. He thus laid up that great store of learning which in the conventions of 1787, and 1788 especially, proved so effective. After Washington, no public man of his time was more widely respected and beloved. The public confidence in and respect for his honesty and singleness of aim toward the good of the country ripened into an affectionate attachment. His bearing and address were characterized by simplicity and modesty. He resembled a quiet student, rather than the head of a great nation. He was somewhat taciturn in public, but when he conversed his tone was weighty and impressive. It was often naked, abstract reasoning; mild, simple, and lucid, but summing up long trains of thought. He had a

strong relish for everything facetious, and told a story admirably. In his old age, when some friends came to visit him, he sank back upon his couch with the smiling words: "I always talk more easily when I *lie*;" and during his last illness, while the family and the doctor were at dinner, his voice was heard feebly from the adjoining chamber crying: "Doctor, are you pushing about the bottles? Do your duty, doctor, or I must cashier you." In addition to the passage already quoted, Jefferson wrote of Madison: "From three and thirty years' trial I can say conscientiously that I do not know in the world a man of purer integrity, more dispassionate, disinterested, and devoted to pure republicanism; nor could I in the whole scope of America and Europe point out an abler head." Madison was a very voluminous writer. His manuscripts were purchased by congress from his widow for \$30,000, and portions of them, "The Madison Papers," were published under the supervision of Henry D. Gilpin, by authority of congress (3 vols. 8vo, 1840).—See William C. Rives, "History of the Life and Times of James Madison" (3 vols., Boston, 1859, '66, and '69), and "Letters and other Writings of James Madison" (4 vols., Philadelphia, 1865).

**MADISON UNIVERSITY.** See HAMILTON, N. Y.

**MÄDLER, Johann Heinrich,** a German astronomer, born in Berlin, May 29, 1794, died in Hanover, March 14, 1874. He gained a high reputation as teacher in the principal normal schools in Berlin. In 1829, in company with his pupil Wilhelm Beer, the brother of Meyerbeer, he commenced the construction of the great map of the moon afterward published at Berlin (1834-'6). This was followed by his *Allgemeine Selenographie* (2 vols., 1837). In 1833 he made chronometrical observations for the Russian government on the island of Rügen. In 1836 he was appointed director of the Berlin observatory, and in 1840 of that of Dorpat. In 1865 he returned to Germany on account of a disease of the eyes. In his work *Die Centralsonne* (Dorpat, 1846) he advanced the hypothesis of the existence of a central body, preponderating in mass, as the universal centre of gravity about which the whole stellar universe revolves, designating the bright star  $\gamma$  Tauri (Alcyone) in the Pleiades as such centre. This latter assumption is now very generally rejected by astronomers. He made a great number of important observations upon the physical aspects of Mars and Jupiter, upon double stars, the determined periods of variable stars, and the centre of gravity of the solar system. Among his works are: *Untersuchungen über die Fixsternsysteme* (Mitau, 1847-'8); *Populäre Astronomie* (Berlin, 1841; 6th ed., 1866); and *Geschichte der Himmelskunde nach ihrem gesammten Umfange* (Brunswick, 1872-'3).

**MADOC,** a legendary Welsh prince, said to have been the son of Owen Gwynedd, who according to Cambrian chroniclers discovered

America more than three centuries before the discovery by Columbus. According to the legends, Madoc, compelled by civil disturbances to leave his native country, sailed westward in 1170 with a small fleet, and after a voyage of some weeks landed on a continent of exuberant fertility, whose inhabitants differed altogether from those of Europe. After some time he returned to Wales, but left behind him 20 of his crew. He fitted out another fleet of 10 sail, departed again with the intention of revisiting the newly discovered land, and was never more heard of. Madoc is the hero of one of Southey's poems.

**MADOCKAWANDO,** a chief of the Etechemin Indians, on the Penobscot, who figured prominently in the border wars between the French and English colonies. He first appears as a leading chief about 1676, when he made a treaty at Boston, but from 1690 to 1694 he was the scourge of the New England frontier. The baron de St. Castin married the chief's daughter Matilda, and the tribe espoused his cause when despoiled by the English. In May, 1690, Madockawando with his Indians aided Portneuf to reduce Fort Casco; and in June, 1692, he made an attack on Wells. He joined in the peace made at Pemaquid in August, 1694, but soon after accompanied Villieu in his operations against Oyster River, now Durham, N. H.

**MADONNA** (Ital.), a word originally equivalent in Italy to the French *madame*, and as such used as a title of deference and honor; but now applied almost exclusively to the Virgin Mary, or, as she is called in other languages, Our Lady. The title has also given the name to a great number of pictures in which the Virgin forms the sole or prominent object, such as the *Madonna di San Sisto* or the *Madonna della Seggiola* of Raphael. The pictures of Madonnas without the infant Christ belong only to modern art; the most celebrated of these is Murillo's "Conception." The "Legends of the Madonna" (8vo, London, 1852), by Mrs. Jameson, describes the manner in which the subject has been illustrated by different painters.

**MADOU, Jean Baptiste,** a Belgian painter, born in Brussels about 1796. He studied under Célestine François, and exhibited in 1835 "The Strolling Musicians" and "The Dealers in Jewelry." He became professor at the royal school, and drawing master to the junior members of the royal family. Among his finest genre pictures are "The Marplots," which was purchased by the government, and "The Entertainment at the Palace," which was much admired at the Paris exhibition of 1855. He also excels as an engraver. Among his designs are those for a work on the "Physiognomy of Society in Europe, from Louis XI. to our Days," and lithographed "Belgian Designs and Costumes, Ancient and Modern," and "Scenes in the Lives of Painters of the Flemish and Dutch Schools."

**MADOZ, Pascual**, a Spanish author, born in Pamplona, May 17, 1806, died in 1870. His studies at Saragossa were interrupted in 1823 by his part in the defence of the castle of Monzon against the French invading army, and by his imprisonment during 17 months, after which he returned to the university, where he graduated; but, expelled on a charge of teaching Jansenist doctrines, he lived for some time at Tours in France. On his return to Spain he became editor of the *Diccionario geográfico universal*, commenced by Bergues (10 vols., Barcelona, 1829-'34), and published a *Coleccion de causas célebres*. In 1835 he was appointed judge at Barcelona, and military governor of the valley of Aran. His successful operations against the Carlists in Catalonia led to his election to the cortes. In 1842-'3 he took a prominent part in the movement against Espartero. In August, 1854, he was appointed governor of Barcelona, and afterward became the leader of the *progresista* party in the cortes. In January, 1855, he was appointed minister of finance, and proposed the famous law of *desamortisation*, decreeing the sale of the property vested in the state, the clergy, and other public bodies. He retired from the ministry in June, and was at the head of the opposition in the cortes until July, 1856, when he was compelled to flee on account of his resistance to the cabinet of O'Donnell. He cooperated in the revolution of 1868, becoming governor of the province of Madrid, and a member of the constituent cortes. In the early part of 1870 he favored Espartero; but when Prim proposed Amadeus, he again sided with him, accompanied the Spanish deputation to the Italian capital, and died on the journey. His principal work is *Diccionario geográfico estadístico y histórico de España* (16 vols. 4to, Madrid 1848-'50), of which he was the publisher as well as editor, having established a printing office at his own expense, and at the same time superintending the sale, the government contributing largely to the expenses.

**MADRAS.** I. A province of British India, commonly known as a presidency, comprising the southern part of the peninsula of Hindostan, bounded N. W. by the Bombay territories, N. by the Nizam's Dominions and the Central Provinces, and on the extreme N. E. by Bengal. It extends from Cape Comorin, in lat.  $8^{\circ} 5' N.$ , to the N. E. limits of the district of Ganjam, in lat.  $20^{\circ} 18'$ , and is included between lon.  $74^{\circ} 40'$  and  $85^{\circ} 15' E.$ , having an extreme length of about 950 m., and a breadth of 450 m. measured northward from the capital. Area, 141,746 sq. m.; pop. in 1872, 31,311,142. For administrative purposes it is divided into three divisions or commissionerships, called the Northern, Central, and Southern ranges, and into 21 districts, as follows, beginning at the N. E. extremity and proceeding southward and westward: Ganjam, Vizagapatam, Godavery, Kistnah, Nellore, Kurnool,

Bellary, Cuddapah, N. Arcot, Chingleput, Madras, Salem, S. Arcot, Trichinopoly, Tanjore, Madura, Tinneveli, Coimbatore, the Neilgherry hill district, Malabar, and S. Canara. The population of the divisions is respectively as follows: Northern Range, 6,794,912; Central Range, 10,436,821; Southern Range, 14,079,409. In the S. W. part of the province are the subject-allied native states of Cochin and Travancore, both of which are prosperously administered under the supervision of the Madras government. Cochin has an area of 1,988 sq. m. and about 300,000 inhabitants; Travancore, about 4,700 sq. m. and 1,500,000 inhabitants. These feudatory states, together with the Malabar and Canara districts, form the western seaboard. French settlements at Pondicherry, Karical, Yanaon, and Mahé are also included within the boundaries of Madras.—The coast line of Madras constitutes one half the entire coast line of the great Indian peninsula, and extends northward from Cape Comorin 540 m. along the Arabian sea and 1,187 m. along the bay of Bengal. The western shore, which is generally muddy or sandy, is known as the Malabar coast. It is deeply indented and penetrated by many creeks and backwaters. Of the latter the most important is at the port of Cochin, which is said to be capable of being made the finest close harbor in the world, as it is 10 m. wide at its southern end, and has a depth varying from 10 to 48 ft. The harbor at Mangalore admits vessels drawing from 10 to 12 ft. The port of Calicut, whence teak is exported, is on this coast. Between Cape Comorin and Calimere point, opposite the N. extremity of Ceylon, the E. coast of Madras is low, rocky, and fringed with reefs. The mainland is here separated from Ceylon by the gulf of Manaar and Palk strait, and almost united to it by a line of islands and the shoals and rocks known as Adam's Bridge. A passage through this obstruction has been constructed by deepening the Pamban channel between the continent and the nearest island, called Rameswar, so that it is navigable for vessels which do not draw more than 12 ft. There is an excellent roadstead at Tuticorin, on this part of the coast. From Calimere point northward to lat.  $15^{\circ} 20'$  stretches the Coromandel coast, a part of the ancient province of the Carnatic, low, sandy, and without good harbors. Its principal port is the capital, Madras; and other important shipping resorts are Negapatam, Nagore, Tranquebar, Cuddalore, Sadras, the French colony of Pondicherry, and Pulicat, at one of the entrances to the extensive salt-water lake or inlet of that name. There is not a harbor on the coast, however, which affords safe anchorage in all weathers. North of the Coromandel coast begins the Golconda coast, extending up to lat.  $17^{\circ} 15'$ , a distance of about 270 m., the only ports of which are Masulipatam and Coringa. Between the termination of this coast and the northern

boundary of the province, the maritime border, which is bold and rocky but not high, is known as the Orissa coast. Ganjam and Vizagapatam are its leading ports.—The mountains of Madras are the Eastern and Western Ghauts, parallel to the E. and W. seaboard respectively, and the ranges which traverse the peninsula and connect them S. of the table land of Mysore, including the Neilgherry hills. (See GHAUTS.) The great rivers of the province flow eastward. They comprise the Godavery, the Kistnah, the Pennar, the Cavery, and the Vygay, all of which flow into the bay of Bengal. There are no large rivers on the W. coast, though small streams are numerous. The tank system of irrigation prevails in Madras, and there are extensive irrigation works in the river deltas, particularly in those of the Godavery, Kistnah, Pennar, and Cavery, the water being diverted by means of dams thrown across the streams just above the heads of the deltas. There are 43,000 tanks in 14 districts, and in the whole province 3,300,000 acres of irrigated land.—The climate of Madras, generally esteemed the hottest in India, seems to vary according to elevation above the sea level, rather than with latitude. Among the Neilgherry hills it resembles that of the temperate zone. The heat is greatest on the E. coast, being lessened in Malabar by the sea breezes and the nearness of the Western Ghauts. This range receives an enormous rainfall during the prevalence of the S. W. monsoon, which begins to blow in April. The N. E. monsoon sets in during October, and is accompanied by much less rain, which fact to some extent accounts for the excessive heat in the eastern districts; the annual rainfall there ranging from 45 in. at Vizagapatam and 50 in. at Madras, to 30 and 22 in. further S., as against upward of 75 in. on the W. coast. Malabar is frequently visited by terrific thunder storms.—The soil of that portion of the province adjacent to the bay of Bengal is light and sandy near the coast, but increases in richness and fertility as the surface rises inland toward the Ghauts and the interior plateau. N. of Vizagapatam the country is somewhat hilly; between that district and the Kistnah a flat alluvial plain stretches backward to the mountains. Bellary, Kurnool, and Cuddapah, known as the ceded districts, are upon the table land between the Eastern and Western Ghauts, at an elevation of from 500 to 1,600 ft. above the sea, while further S. wide plains, traversed by rivers, slope seaward from the inland ranges. The rugged western coast rises more abruptly, and borders an elevated region of exuberant vegetation and magnificent forests. Ship timber, including teak and peon, grows abundantly and of excellent quality in Travancore, Malabar, and Canara, and forms one of the most valuable products of the province. The finest teak plantation in all India is in Malabar on the river Bepur, where the annual rainfall is 150 in.;

it contains 1,800,000 trees. The Madras forest department maintains 26 plantations for railway fuel, three or four for teak, and two for sandalwood, which is exported to China.—The chief agricultural productions of Madras are rice, cotton (of which the largest quantity is raised in the Tinneveli district), sugar, and coffee, which is the special product of the province. In 1872, 72,983 lbs. of cinchona bark were obtained from the government plantations on the Neilgherry hills, where there are 2,639,285 plants. Small quantities of tea, indigo, and jute are raised. Other important crops are a small dark-colored grain called ragi, millet, maize, tobacco, oil seeds, spices, pulse, yams, and plantains. An intoxicating beverage is made from the sap of the palmyra palm, and the cocoanut palm is raised both for its fruit and cordage. Iron is the most abundant mineral, and immense deposits of magnetic ore, from 50 to 100 ft. in thickness, occur in the Salem district. Coal of inferior quality is found on the banks of the Godavery. Large quantities of salt are produced by manufactories under government control. The consumption of salt averages 12 lbs. per annum for each inhabitant.—The city of Madras is connected by railway with Bombay, Negapatam, Bangalore, and Bellary. Up to April 1, 1873, 957½ m. of railways had been opened for traffic in the province. An important line of water communication is afforded by the Malabar and Travancore back-waters, and the delta canals are much navigated by boats. The foreign trade is with Great Britain, France, New South Wales, America, Mauritius, Ceylon, the Straits Settlements, and ports on the Arabian sea and Persian gulf. The following table shows the quantity and value of the principal articles exported from Madras in 1871-'2:

ARTICLES.	Quantity.	Value.
Coffee.....	52,047,458 lbs.	£1,278,759
Cotton.....	73,771,643 lbs.	1,684,942
Grains.....	2,370,247 cwts.	827,017
Indigo.....	44,598 cwts.	1,193,715
Jute.....	4,771 cwts.	2,728
Seeds.....	538,735 cwts.	433,461
Tea.....	36,758 lbs.	4,883

The total value of the exports, inclusive of treasure, from Madras for the year ending March 31, 1872, was £7,297,324. The principal articles imported in 1871-'2, with their values, were as follows: cotton twist and yarn, £718,326; cotton piece goods, £1,084,594; machinery, £16,422; manufactured metals, £83,873; raw metals, £100,638; railway materials and stores, £60,232; silk goods, £9,093; wines and liquors, £211,449. The total value of the imports, including treasure, for the year ending March 31, 1872, was £3,792,232. The chief exports to Great Britain, and the quantities and value thereof, for the entire year 1872, were as follows: cotton, 75,238,688 lbs., £2,099,310; coffee, 27,979,280 lbs., £888,108; indigo, 19,413 lbs., £508,042;

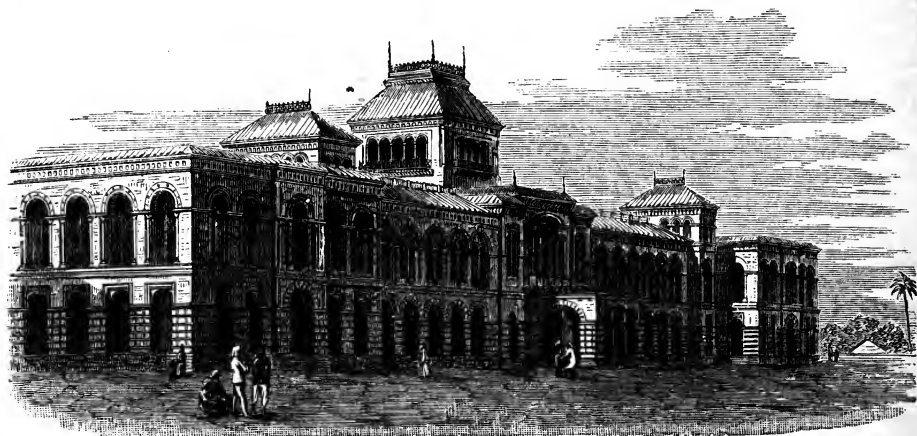


goat skins, 4,103,367, £448,608; sugar, 31,170,496 lbs., £353,040; and cocoanut oil, 129,272 cwts., £266,341. The total value of the exports to Great Britain in the same year was £5,653,636. The total value of the imports from Great Britain and the British colonies in 1872 was £1,491,630. In 1871-'2, 3,497 vessels, of 493,372 tons, entered the ports of the province from foreign countries; and the clearances to foreign ports comprised 3,738 vessels, aggregating 571,728 tons.—The ryotwar system of land revenue, whereby each ryot or actual cultivator pays a fixed money assessment directly to the government, prevails throughout the greater part of Madras. The net revenue derived from land in 1871-'2 was £4,016,555 on 16,877,509 acres. The districts of Ganjam, Vizagapatam, and a part of Godavery, embracing most of the former Northern Circars, are subject to a permanent land settlement like that of Bengal; and there are many rent-free estates in the country. In Malabar a proprietary tenure exists, the landlords retaining from 20 to 40 per cent. of the rent received from the cultivators, and paying the balance to the government. The salt monopoly yielded a net income of £1,153,425 in 1871-'2. A bonus of £40,000 a year is paid to the French government to prevent the manufacture of salt at Pondicherry. The receipts for customs in 1871-'2 were £298,206, and the excise revenue was £553,791.—Under the former division of British India into three presidencies, the proper designation of Madras was the presidency of Fort St. George, from the name of the principal fortification at the capital. The administration is in the hands of a governor, assisted by a council of three persons, of whom the commander-in-chief is one, and also by a legislative council. The governor is appointed by the crown. The military force under the government supplies troops not only for Madras itself, but also for the Central Provinces, the Nizam's Dominions, Mysore, and Burmah; in 1871-'2 it comprised 40,121 men, of whom 26,934 were natives and the rest British. There are 46 municipalities in Madras. The principal cities and towns are Madras, the capital, Ganjam, Bellary, Tanjore, Trichinopoly, Calicut, and Cochin. The entire number of judicial divisions is 699, with 760 judges. There are six classes of civil tribunals and seven classes of criminal courts. The high court, composed of a chief justice and four puisne justices, exercises original civil and criminal jurisdiction in the city of Madras, and appellate jurisdiction throughout the country. In 1871-'2 there were 4,401 schools and colleges in the province, with an average daily attendance of 135,192 pupils. At the head of these educational institutions stands the Madras university, attended by more than 500 undergraduates; with it are affiliated 13 colleges and 52 high schools. In the southern districts education is largely under the control of Christian missionaries, who exert great influence, partic-

ularly in Tanjore, Tinneveli, Travancore, and Madura; in the last named district there is a prosperous American mission with 7,000 converts. There are 160,955 native converts in the province. Hindoos make up the bulk of the population, and more than half the entire number of inhabitants are of Tamil nationality. The country is well furnished with medical dispensaries, which are numerous and popular. In 1871-'2 there were 508 books published in Madras, in the English, Tamil, Telugu, Malayalam, and Canarese languages. The latest official reports contain no information as to the newspapers. II. A city, capital of the province, on the Coromandel coast of the bay of Bengal, in lat. 13° 5' 10" N., lon. 80° 16' 29" E., 835 m. S. W. of Calcutta, and 640 m. S. E. of Bombay; pop. in 1872, 395,440, mostly Hindoos. According to the census of June 15, 1871, there were but 1,308 British-born residents. The city extends about 9 m. along the shore, with an average breadth of 3½ m. It is bounded S. by the small river Adyar, which is not navigable; another small river called the Kuam, at the mouth of which is an island, flows through the city from W. to E., and connected with this stream is the Cochrane canal, extending northward. Fort St. George, a strong and handsome fortress, having a double line of bomb-proof defences on the land side, and a sea face 500 yards in length, with accommodations for a garrison of 1,000 men, fronts the sea immediately N. of the mouth of the Kuam. The most populous section of the city, called the Black Town, is about 1 m. in width, extending northward from the Kuam, and 1½ m. long, between the Cochrane canal and the seashore. It is protected by a stone wall against the inroads of the spring tides, to which its low level renders it liable. It contains three broad and well built streets, in which there are some fine residences and shops; but the minor streets, inhabited by the natives, are narrow and dirty. In the outskirts or suburbs of the city, which rise to a height of 20 ft. above the sea level back of the Black Town, are many ornamental villas belonging to the European residents, usually light and comfortable two-story dwellings, in enclosures thickly planted with shade trees. The custom house, some of the government buildings, and the warehouses and offices of the principal European merchants, are built along the beach; and here too are the principal drive and promenade, and the fine esplanade adjoining the fort. The government house stands in a park on the S. side of the Kuam river, opposite the island; immediately W. of it, on the shore of the bay of Bengal, is the marine villa, where the governor resides in hot weather. Other notable public buildings are the arsenal, the mint, the military male orphan asylum, the university, and the Madras club. There are three cathedrals in the city, English (St. George's), Scotch (St. Andrew's), and Roman Catholic, seven or eight Anglican churches,

American and Armenian missions, a mosque, and several unpretending Hindoo temples. The institutions of learning comprise the Madras university, which was founded by Lord Harris in 1857, the presidency college, the medical college, the school of art, and the government central museum, with a zoological garden attached, which was visited by 116,691 persons in 1871-'2. The Madras literary society, a distinguished branch of the London Asiatic society, was founded in 1818. An excellent astronomical observatory is maintained by the government, and its recorded observations extend back to the year 1787. An agri-horticultural society was founded in 1835. Madras is supplied with excellent water from wells in the Black Town; it is conveyed in pipes to two reservoirs, and thence distributed through the city. The streets are lighted with gas. There is telegraphic communication from Madras to all the leading cities of India, and by

submarine cable to Penang and Singapore. The railway lines leading from the city are referred to in the account of the province.—Madras is totally destitute of a harbor. Large ships are obliged to anchor about 2 m. from the beach in nine fathoms of water, and landing is effected by boats called masulahs, built of thin planks, flat-bottomed, without ribs or keel, and so flexible as to yield to the impulse of the breakers. The greatest skill is required to conduct them through the tremendous surf, in which no boat of ordinary construction could live a moment. The native fishermen use a float or raft called a catamaran, consisting of two or three light logs lashed together, upon which they make their way through the surf in weather far too rough for boats. Throughout the S. W. monsoon the anchorage is extremely hazardous, and ships are often obliged to cut loose their anchors and put out to sea. Propositions for the erection of a breakwater



The Presidency College, Madras.

2,000 yards long, or of two piers so placed as to form a closed harbor, were under consideration by the government in 1873. A lighthouse, 128 ft. high, furnished with a powerful flashing light, stands near the fort. In the year 1871-'2, the value of the imports and exports of the port of Madras was as follows:

	Imports.	Exports.
Merchandise.....	£2,515,073	£2,640,344
Treasure.....	450,080	260,723
Total.....	£3,065,103	£2,901,067

—Madras was founded in 1639 by Francis Day, chief of the British factory at Armegon, the second English settlement on the Coromandel coast, who in that year removed his establishment to the site of the present city, and built Fort St. George on a small tract of territory granted by a native prince. The settlement was known at first as Chenappatam.

The presidency was created in 1653. The city was blockaded in 1702 by Daoud Khan, a general of Aurungzebe. In September, 1746, it was besieged by the French under Labourdonnais, and surrendered after five days' bombardment. In 1758-'9, having reverted to Great Britain by the peace of Aix-la-Chapelle (1748), it successfully withstood a siege by a large French and native force under Lally. After the first war with Tipoo Saib in 1799, the presidency was enlarged by the incorporation of Canara, Coimbatore, and the Neilgherry hills, parts of the conquered kingdom of Mysore; and soon afterward Bellary and Cuddapah were ceded to Madras by the Nizam. In 1801 the nawaub of the Carnatic, whose dominions comprised the present districts of Nellore, N. and S. Arcot, Trichinopoly, and Tinneveli, transferred them all to the British. The Madras government acquired Kurnool in 1841, and ceded N. Canara to Bombay in 1862. The city and province remained undisturbed during the sepoy mutiny.

**MADRAZO.** I. José Madrazo y Aguda, a Spanish painter, born in Santander, April 22, 1781, died in Madrid, May 8, 1859. He studied at the academy of Madrid, in Paris under David, and in Rome, where he spent several years, having been sent there by the king of Spain. In 1818, on his return to Madrid, he became director of the academy, and afterward of the museum, presiding over the former institution till his death. His principal works are: "Jesus in the House of Ananias," "The Sacred Heart of Jesus," "Battle of Cerignola," "Seizure of Breda," "Storming of Montefrío," and an admirable portrait of the empress Eugénie. II. Frederico Madrazo y Kunt, a Spanish painter, son of the preceding, born in Rome, Feb. 12, 1815. He received his first instruction from his father, completed his studies in Paris under Winterhalter, and became the most fashionable portrait painter of Madrid. In 1873 he was elected an associate member of the French academy of fine arts. Among his historical pictures are "Godfrey of Bouillon," and "Godfrey proclaimed King of Jerusalem," the latter at Versailles. His "Holy Women at the Sepulchre" obtained a first medal at the Paris exhibition of 1855.—His brother Luis won in 1848, at the school of Madrid, the great prize of Rome. His principal work, at Madrid, is the "Burial of St. Cecilia."

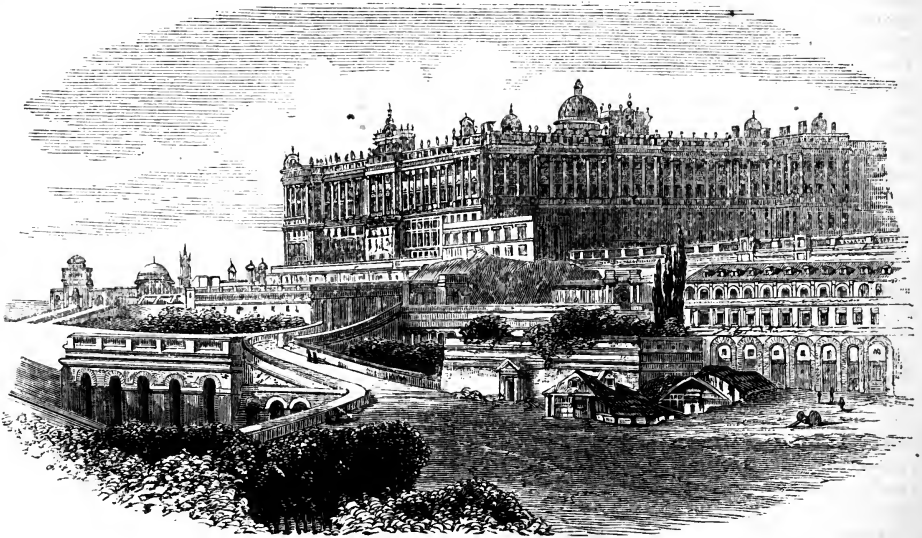
**MADREPORE.** See CORAL.

**MADRID.** I. A central province of Spain, in New Castile, bordering on Segovia, Guadaluajara, Cuenca, Toledo, and Avila; area, 2,997 sq. m.; pop. in 1870, 487,482. The general aspect of the province differs little from that of the other portions of the plain of the Castiles, which, with a mean elevation of 3,500 ft. above the sea, is covered with secondary formations, grit stone, gypsum, mineral salt, and the Jurassic calcareous stone, and is almost everywhere devoid of vegetation. The surface is generally mountainous, particularly in the north, where rises the granitic summits of the Sierra de Guadarrama, covered with snow several months in the year. The Tagus, forming a portion of the S. boundary, with its branches the Guadarrama, Jarama, Tajuna, Henares, and Manzanares, drains almost the whole of the province. Although the mean annual temperature is about 60° F., the climate is somewhat severe, and the transitions from heat to cold are extremely rapid. In the few fertile districts, especially in the south and west, wheat, rye, barley, oats, and hemp are grown in abundance; some wine and olive oil are produced; and there are large numbers of sheep and goats. The chief town, besides the whole of the province. II. A town, capital of the province and of Spain, on the left bank of the Manzanares, 310 m. E. N. E. of Lisbon, 640 m. S. W. of Paris, and 795 m. S. W. of London; lat. 40° 25' N., lon. 3° 42' W. The population in 1870, according to the official *Guía de forasteros*, was 332,024, an increase of 60,770 since 1857, partly attributable

to the influx of refugees from the wars in Cuba and France. The only merit of the situation of Madrid is that of being the geographical centre of Spain. The town stands in a vast basin forming part of a plateau of sand hills about 2,200 ft. above the sea, and arid even in the cultivated portions, with no indication of the vicinity of a great capital until within a short distance of the walls. Here the scene becomes almost grand; new plantations are springing up in every direction to replace the dense forests which in early times covered the whole plateau; a sort of boulevard, encircling the town, and well shaded with trees, expands at many points into a network of delightful public walks; the spires and domes within rise glittering in the sun; and the Somosierra mountains and the snow-capped Guadarrama range, fringing the horizon N. E. and N. W., form a picturesque background.—Madrid is surrounded by a brick wall 20 ft. high, but comparatively useless for defence, with 15 gates; the finest of these is the Puerta de Alcalá, 72 ft. high, with five openings, being a triumphal arch erected by order of Charles III. in commemoration of his entry in December, 1759. The town, about 1½ m. long from N. to S., and 1½ m. wide from E. to W., is traversed nearly in a straight line N. E. and S. W. by the *calles* (streets) Alcalá, Mayor, Platerías, and Almodena, dividing it into two *cuarteles* or quarters, each of which is subdivided into five districts, and these in their turn into *barrios* or wards, 98 in number; and there are 658 streets, lanes, courts, and alleys, and 72 *plazas* or public squares, large and small. The streets in the ancient or S. W. districts are tortuous, narrow, and ill kept; but in the modern portions of the centre and east they are spacious, regular, clean, adequately lighted with gas, and lined with rows of lofty houses, palaces, and noble public edifices. The houses are generally large, built of brick, four or five stories high, with balconied windows; and most of them are let in separate floors, as in Paris. In the streets S. of the Plaza Mayor, windowless shops, open to the street like oriental bazaars, and thronged with Manchegeois mendicants, Andalusian smugglers, or gypsies from Guadaluajara, are common. There is an abundant supply of water, the best being from a spring outside the Puerta de Segovia, with excellent hydraulic machinery established by an English company; the water brought from a distance of 32 m. by the canal of Lozoya, an admirable work, the engineer of which has been created marquis of Lozoya, is copiously distributed through the town by numerous jets and fountains. The chief streets are those of Alcalá, ¼ m. long, the handsomest in Spain, and one of the widest and finest in the world, Mayor, Montera, Carretas, Gerónimo, Ancha, and Toledo, all except the last two radiating from the Puerta del Sol, and forming the principal commercial thoroughfares, with elegant shops, mostly kept by foreigners, and especially

French. Among the plazas, that of Oriente, before the royal palace and behind the Teatro Real, is the largest. In the centre of the grounds, which are oval, is a magnificent bronze equestrian statue of Philip IV., removed from the Buen Retiro in 1844, 19 ft. high, weighing 20,160 lbs., and cast in Florence in 1640 by Pedro Tacca, from a model in wood by Montafes, with bassi rilievi representing Philip knighting Velazquez, and allegorical accompaniments. The outermost promenade is embellished with 44 colossal statues of kings and queens. The Plaza Mayor, first named Plaza del Arrabal, 398 ft. long by 306 wide, was built in 1619 by Juan de Mora, under Philip III.; a bronze equestrian statue of the latter was removed from the Casa de Campo at the W. end to the centre of this square in 1848. Here stands the Real Casa de la Panaderia (so named

because bread was formerly sold therein by weight), with its frescoed saloons by Cuello and Donoso, in which the king and courtiers formerly assembled to witness the *fiestas reales* (bull fights, tournaments, &c.) and the *autos de fe*, which took place in the Plaza Mayor, the heretics being there arraigned before their judges, condemned, and then led to the stake without the gate. Laborers excavating for the formation of a new boulevard in 1869 discovered a succession of layers of charcoal mingled with the incriminated remains of hundreds of victims. Many of the best buildings of the square were repeatedly destroyed by the flames. The duke of Osuna's palace in the Plazuela de la Villa, near the *casa de ayuntamiento* (town house), was long occupied by the dukes of Infantado, and for a time by Ferdinand and Isabella. The town house dates from



The Palace, Madrid.

the 16th century. A very good bronze statue of Cervantes, the cost of which was defrayed by a religious fund, has been erected in the Plaza de las Cortes; and there is a street named after him. The Plazuela de la Cebada, adjoining the calle de Toledo, is the hay market, where criminals were formerly executed; a house in the Plazuela de Santo Domingo, which was the principal scene of the revolution in June, 1866, was demolished by the government artillery; in the Plazuela de la Paja, opening on the calle de Segovia, many victims were executed in the times of persecution and tyranny; and a cross in the centre of the diminutive Plazuela de la Cruz Verde, N. of Paja, marks the spot where the last heretic was burned in Madrid. But the best known of all the Madrid squares is the world-famous Puerta del Sol, once the E. portal of the ancient town, and now the

heart of the modern, and the favorite rendezvous for business or pleasure. On the S. side of this, the Mecca of all true Spanish pilgrims, are the *palacio de gobernacion* (government palace) and the post office; while a handsome pile of edifices at the E. extremity occupies the site of the old church of the Buen Suceso, memorable as being the scene of the melancholy events of May 2, 1808. Here also are the best hotels and cafés; and in the immediate vicinity are grouped the modern clubs and reading rooms, which have largely diminished the old custom of lounging in the Puerta del Sol.—First among the numerous promenades is the Prado, 2½ m. long, but divided into several branches. The Prado proper extends from the calle de Atocha on the south to that of Alcalá north, and is thence continued by the Prado or Paseo de Recoletos. The most fashionable portion, the *salon*, between

San Gerónimo and Alcalá streets, is about 1,450 ft. long and 240 ft. wide, and is decorated with three superb fountains: Cybele on a car drawn by two colossal lions of white marble, at the north, Apollo in the centre, and Neptune to the south. There are five smaller fountains in the Prado, and on the *campo de lealtad* (field of loyalty), beside the salon, is a beautiful obelisk to the memory of the victims of the *dos de mayo* (May 2), surrounded by funereal cypresses. Among the gay crowds which throng this paseo on fine afternoons, in carriages, on horseback, and on foot, the graceful national veil and mantilla of the women of the middle classes and the *capa* or cloak of the men are still worn; but French fashions have been generally adopted by the higher ranks. The Fuente Castellana, formerly called the Delicias de Isabel, is a prolongation of the Prado; it was laid out during the regency of Espartero, is embellished with two fountains, and comprises three parallel avenues, that in the centre being for equestrians and carriages. Other paseos are those of Atocha, a favorite resort for invalids, being more sheltered than the rest; Las Delicias, from the Puerta de Atocha to the banks of the river; La Virgen del Puerto, between the Puerta de Segovia and that of San Vicente, along the banks of the Manzanares, the usual holiday resort for the lower classes; and La Florida, a northern continuation of the last. The new suburban boulevard de Narvaez, about 1 m. long, parallel to the Fuente Castellana, and planned by the marquis of Salamanca in 1865, will greatly enhance the picturesqueness of that locality. The gardens and other public grounds of Madrid are more numerous than beautiful. The most noteworthy is the Buen Retiro, an extensive park arranged for Philip IV. by the duke of Olivares, E. of the Prado, and extending from the calle de Alcalá to the Paseo de Atocha; it contains numerous spacious and shady walks, a pond, a lake, a *mirador* or belvedere commanding a magnificent view of the town, a menagerie, botanic gardens, and the observatory. The garden was used by the French as a military post in 1808, and little has since been done to reclaim it from decay. N. of the Buen Retiro are the Campos Eliseos, with well kept gardens and a small theatre (Teatro de Rossini), frequented in summer by multitudes of pleasure seekers. On the W. side of the town are the Montaña del Príncipe Pio, and the ancient Jardin del Moro, now the palace gardens.—Madrid is a suffragan bishopric of Toledo, and has no cathedral, ranking consequently as a town (*villa*), and not a city (*ciudad*). The place of a cathedral is supplied by the antique church of Santa Maria de la Almudena, once a mosque, but dedicated to the Virgin by Alfonso VI. The architecture and decorations of this, as of all the other churches, numbering between 60 and 70, are with few exceptions barbarous. The church of Nuestra Señora de Atocha, founded for the Dominicans in 1523, contains the wonder-working image of

the Virgin, patroness of Madrid, whose miracles have been sung by countless poets, from Lope de Vega down to our time. The treasure of this church, valued at \$500,000, was seized by the revolutionary government in 1868. Isabella II. with her husband and family attended a special mass here every Saturday. Among the other most important churches are the *colegiata* or convent of San Isidro (the patron of Madrid), founded in 1651, with frescoed cupolas by Claudio and Donoso Cuello; the royal chapel, in the palace, with a ceiling from the brush of Giaquinto, and gorgeous tapestry; and those of Cármen Calzado, Descalzas Reales, and Encarnación. The convents, of which Madrid once possessed the largest number of any one city in the world, have been almost entirely suppressed, and the buildings either demolished or appropriated to other purposes. Protestant churches have been established of late years, and large congregations formed, while Protestant Sunday schools are multiplying in several quarters of the town.—The most distinguished public edifice is the royal palace, erected in 1737-'50, one of the most magnificent in Europe; it is of granite and white marble, occupies an area of 220,900 sq. ft. on the site of the ancient Moorish *alcázar*, and rises dazzlingly white against the sky to a height of 100 ft., between the Plaza de Oriente and the palace gardens. The ceilings are masterpieces of Corrado, Mengs, Tiepolo, and Velazquez; the decorations include gorgeous mirrors from San Ildefonso and the richest marbles of Spain, and until recently the walls were hung with a profusion of paintings by the best masters, many of which have been removed to the Museo Real. The palace library contains about 100,000 volumes; the royal stables, N. E. of the palace proper, have an astonishing variety of carriages, and in regal days sheltered the hundreds of horses, ponies, and mules comprising the monarch's stud. But the most curious of all the appurtenances of the royal residence is the armory (*real armería*), with 2,533 specimens of arms and accoutrements, embracing the armors of Guzman el Bueno, Gonsalvo de Cordova, Hernan Cortes, Columbus, and that worn by Don John of Austria at the battle of Lepanto, with the crowns of the Gothic kings found in the mountains of Toledo. In the throne room is a valuable numismatic collection, of upward of 150,000 specimens. The royal museum, in the Prado, is unequalled in the world for its collection of masterpieces of painting, the number of which, catalogued in 1874, is about 2,500; "a collection," says Mr. Hay, "not only the greatest in the world, but the greatest that can ever be made until this is broken up." It comprises 46 works of Murillo, conspicuous among which is the "Martyrdom of St. Andrew;" 65 of Velazquez, 53 of Ribera (the least sympathetic of the Spanish masters), 10 of Raphael, 64 of Rubens, 60 of Teniers (of whose works the Louvre possesses only about a dozen), 43 of Titian, 34 of Tintoretto, and 25 of Paul Veronese; while



some of the great masters of Spanish art, such as Zurbaran (whose chief works are in Seville), Herrera, Morales, and Juan de Juanes, are meagrely represented. Other museums are that of natural sciences, the national, the naval, and the museum of artillery. The only other public edifices worthy of mention are the *palacio de los consejos* (palace of the councils); that of Buena Vista, with fine pleasure grounds, and occupied by the offices of the ministry of war; the custom house, built in 1769, and in which are the offices of the ministry of finance; the post office; the *casas consistoriales* (town house), completed in 1580; the old *casa de los ministerios*, built by order of Charles IV., and now occupied by the ministry of the navy, which, with the other ministerial departments, the public picture galleries, and numismatical and archæological museums, are to be reunited in the new government house in process of construction in the Recoletos promenade, where likewise stands the mint; the senate, in the Plazuela de las Cortes; the *casa de los Lujanes*, in which Francis I. of France was confined in 1525-'6, and the tower of which now serves for a telegraph; the national printing office; the stock exchange; and the three magnificent bridges over the pigmy stream of the Manzanares, dry for three months in the year. The finest private residences are those of the duke of Alva and the marquis of Salamanca, Spain's great financier.—There are 13 hospitals and a number of charitable institutions. Among the former are one general and one military hospital, two for incurables, one for transient residents, one each for Aragonese and Navarrese, French, and priests, with founding, orphan, and lying-in hospitals. There are 13 barracks for regular troops, the *guardia civil*, and the police, a most efficient corps. Among the learned societies are the Spanish academy, for the culture and perfecting of the language; the academies of sciences, moral and political sciences, history, jurisprudence and legislation, medicine and surgery, veterinary medicine, and the three noble arts, and the medico-chirurgical of Madrid. The schools and colleges are very numerous and well organized. There are special schools of pharmacy, law, medicine, and military science; also deaf and dumb, engineering, normal, industrial, and art schools. The public schools are governed by a board of commissioners under the jurisdiction of the minister of public instruction. Besides the library of the royal palace, already noticed, there are 17 others in Madrid, the most extensive of which are the national library, with nearly 250,000 volumes, and the duke of Osuna's and duke of Medinaceli's private libraries, containing 60,000 and 15,000 respectively. Madrid has an Italian and a Spanish (*Zarzuela*) opera, five leading and a multitude of minor theatres, two good circuses, a cockpit of large dimensions (*circo gallístico*), and innumerable concerts, dancing rooms, &c. But the scene

of the great national pastime is the bull ring (*plaza de toros*), just outside the Puerta de Alcalá; it was built by Philip V., and has seats for 12,400 persons. The old edifice having been demolished in 1874, a new one is to be built N. of the former site. The several cemeteries of the capital offer little interest; many of the tombs have been destroyed by invading armies, and nothing has been done toward restoration. There is a Protestant burying ground outside the Puerta de Toledo, consecrated in 1866 by the bishop of Illinois.—The climate is exceedingly severe, the heat being oppressive in summer and the cold intense in winter, while in the intermediate seasons the transitions of temperature are very rapid; owing to the sharp winds from the snowy mountains N. of the town, there is at times a difference of temperature as great as 20° between the sunny and shaded sides of the streets. The average annual temperature is about 60° F., the extremes being 30° and 90°. The maladies most common are pneumonia and other affections of the respiratory organs, apoplexy, and paralysis.—The number of native Madrilenians is comparatively small, and forms one of the least numerous elements of the community; foreigners abound, especially French, English, and German, nearly all shopkeepers; and the menial ranks, both public and private, are usually filled by sturdy Asturians, Gallegos, Aragonese, and Navarrese. The natives are extremely polite, and the men in the middle and upper classes generally well educated; but the mental culture of the women is mostly limited to the elementary branches, and the acquirement of music and similar accomplishments. Black silk dresses and colored shawls or mantillas are commonly worn by the women, with a veil gracefully draped from the hair; but in the higher circles little difference is observed between the costume of a belle of Madrid and one of Paris. Among the men the French fashions prevail, with the only modification of the traditional *capa* or cloak.—Madrid being rather a centre of consumption than of production, its manufacturing industries are of little importance, and limited to articles of indispensable necessity, such as chocolate, beer, shoes, hats, and gloves, all of superior quality. There are two prosperous foundries, established about 1850; plated ware of excellent quality is manufactured on a large scale; and coach making has been brought to greater perfection than any other branch. Madrid being the entrepot for all the inland provinces of Spain, the transactions in cereals, wines (especially that of Valdepeñas), oils, and colonial produce are very considerable; and from Sept. 25 to Oct. 6 are held the annual fairs for the sale of hardware, furniture, ready-made clothes, books, pictures, &c., by immense numbers of peripatetic vendors from the provinces. There are 10 banks, including the banks of Spain and of Madrid, a savings bank, and 49 incorporated mercantile associations, insurance companies,

&c. The means of conveyance through the town are at once abundant and cheap; and Madrid communicates by railway with Lisbon and Paris, the latter being reached, *via* Bayonne, in 19 hours.—The earliest authentic historical record of Madrid occurs in Sapiro's *Crónica de España*, referring to the 10th century, under the Moorish name of Magerit, which was Latinized into Majoritum. Under the rule of the Moors it was a mere military outpost, which was finally taken from them toward the end of the 11th century by Alfonso VI. of Castile, who annexed it to the bishopric of Toledo, to which it still belongs. It was rarely occupied by the court until the reign of Henry III. of Castile, who resided there almost continually, attracted by the pleasures of the chase, the neighboring mountains abounding then with wild boars and bears. It first rose to importance under Charles V., who made it his occasional residence; and Philip II. at last made it his capital and "only court" in 1560. Madrid was entered by the French under Murat, March 23, 1808; but the heroic rising of the inhabitants on May 2 obliged them to evacuate the town. It was entered by Joseph Bonaparte July 20, and again evacuated Aug. 2. Napoleon finally took possession of it in December following, and King Joseph held it till 1813, when it was restored to Spain by Wellington. Madrid has been the centre of frequent insurrections and revolutions, as in September, 1868; and it is the birthplace of a host of peninsular celebrities, including Lope de Vega, Calderon de la Barca, Quevedo, the Moratins, and Larra.

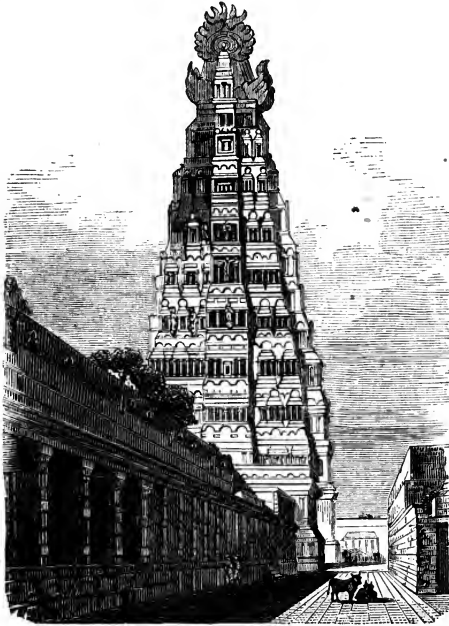
**MADRIGAL**, in music, a vocal composition in from three to eight parts, set commonly to words of an amatory or pastoral character, and intended to be sung by several voices on a part and without instrumental accompaniment. It took its rise in Italy about the commencement of the 16th century, whence it soon made its way over the civilized world. The Netherlanders were the first to adopt the new form. Although cultivated to some extent both in France and Germany, it did not supplant the *chanson* in the one nor the folk song in the other. In England it took firm root, and there madrigal singing continues to be practised to the present time. Richard Edwards, probably the earliest of English madrigal writers, was musician to Henry VIII. The best English madrigals were written within the century succeeding his death. The practice of such music during that period formed a considerable part of the entertainment of persons of education, and sight singing was then more common than now. At first madrigals were sung in England with Italian words. William Byrd was the first to publish a collection of them with translated text, entitled "*Musica Transalpina*, Madrigales translated, of four, five, and six partes, chose out of divers excellent authors, by Master Byrd" (1588). The music of the madrigal

is usually constructed of short and simple phrases, treated freely and with every resource of florid counterpoint. The fundamental musical form is imitation, and in this, and in the canon and fugued passages with which it abounds, it is distinguished from the strictly harmonized folk song. Among the most distinguished of the Italian madrigal writers were Marenzio, Gastoldi, Vacchi, and Festa; while Wilbye, Weelkes, Morley, Gibbons, and Ford held equal rank in England. Madrigal societies are still maintained in England, and within a few years several have been formed in the United States. Henry Leslie in England and Caryl Florio in America have recently made admirable compositions in this form.

**MADURA**, an island of the Indian archipelago, in the Sunda group, N. E. of Java, from which it is separated by a strait from 1 to 2 m. wide; area, about 1,300 sq. m.; pop. in 1870, 662,720. A chain of low calcareous hills runs through it, but there are no high mountains. The geological formation and vegetable products resemble those of Java; the soil is generally poor, and a large part of it is uncultivated. The principal product is salt. The inhabitants are of the same race as the Javanese, and about on a level with them in point of civilization, but they speak a language of their own in two very distinct dialects, using the Javanese however in writing. They have a nominal sovereign who resides at Bangkalan, but the whole island is subject to the Dutch, under the colonial administration of Java. Many Madurese have settled in Java, where it is supposed that they number nearly 1,000,000.

**MADURA**, a city of India, capital of a district of the same name in the province of Madras, on the right bank of the Vygay, 95 m. S. W. of Tanjore; pop. about 30,000. It is surrounded by a high wall of stone, with massive square bastions, but now in a ruinous condition in many parts. The streets are wide and regular, and there are spacious market places, but most of the private buildings are mean. The public buildings, though now falling into decay, present some of the finest specimens of Hindoo architecture in India. Among the most noted are the Pandiyan palace, a vast structure with 100 granite pillars and a dome 90 ft. in diameter, and with a choultry or building for travellers in its front 312 ft. long; and the great temple of Mahadeva, which with its four porticoes, each a pyramid of 10 stories, and its spacious courts and choultries, covers an immense area.—Madura is probably the Modura of Ptolemy, and is supposed to have been founded about the beginning of the Christian era. It was rebuilt in the 9th century by Vansa Sechera, who founded there the college of Madura, long a seat of Brahmanical learning. During the competition for India between the British and French in the 18th century, it sustained many sieges. In 1606 Roberto de' Nobili, a Portuguese Jesuit missionary, came to Madura, and assumed the habit and

usages of the Brahmans, but made converts to Christianity. His conformity to heathen customs was denounced to the pope, who suspended him for ten years. He resumed his work in 1623, and under him and his followers the mission flourished till the middle of the 18th century, when, by the wars between the French and English, the natives discovered that the missionaries were Franks. Their converts had been reckoned by tens of thousands, but rapidly fell off upon the discovery. The mission was resumed in 1837, and in 1873 had 78 priests. Madura was made the centre of a Protestant mission, under the care of the American board of foreign missions, in 1834, which in 1873 had in and around the city 30



Pagoda at Madura.

churches with 1,547 members, 149 congregations of natives who have renounced heathenism, and 100 schools, of which 93 are free day schools, and one a training school for teachers. The mission had also a dispensary in Madura which treated 10,000 patients, and another in the district which treated about 15,000. The district, which includes Dindigul, has an area of about 10,700 sq. m.; pop. in 1872, 2,259,263. It is largely composed of marsh and jungle, but in the northwest it is mountainous. Its chief river, the Vygay, falls into Palk strait.

**MADVIG, Johann Nikolai**, a Danish philologist, born at Svanike, in the island of Bornholm, Aug. 7, 1804. He completed his education at the university of Copenhagen, where in 1829 he was appointed professor of the Latin language and literature. He has edited the works of Cicero, Lucretius, Juvenal, and Livy, and in

1829 wrote a pamphlet to prove that the work *De Orthographia* of Apuleius, first published by Mai in 1823, was written by a literary impostor of the 15th century. Among his remaining contributions to philological literature are a "Glance at the Constitutions of Antiquity," "The Creation, Development, and Life of Language," "On the Fundamental Idea of Ancient Metres," a new "Latin Grammar for Schools" (translated by the Rev. G. Woods, 4th ed., Oxford, 1859), and *Adversaria Critica ad Scriptores Græcos et Latinos* (vol. i., 1871). In 1848 he was made minister of public worship, and in 1852 general director of public instruction. In 1854 he was elected to the diet, of which he became a prominent member, advocating especially the interests of the university of Copenhagen, and a union of the Scandinavian nations.

**MÆANDER**, the ancient name of a river in western Asia Minor, now called Menderes, or Meinder. It rises near the S. extremity of the Turkish vilayet of Khodavendighiar (S. Phrygia), flows S. W. (through Caria), and falls into the Archipelago a little north of the site of ancient Miletus. Its principal affluents are the Arras Tchai (anc. *Harpasus*), and the Tchine (*Marsyas*). The Mæander carries down an immense quantity of mud, which has extended the coast so as to take in several small islands. From its peculiarly winding course its name has become a synonyme for tortuousness. It is about 300 m. long, including windings, and very deep, but navigable only by small craft.

**MÆCENAS, Caius Cilnius**, a Roman statesman, born between 73 and 63, died in Rome in 8 B. C. Though his family was only of the equestrian order, it was yet of high antiquity. Mæcenas received an excellent education, and was well acquainted with Greek and Roman literature. He was the principal counsellor of Octavius, negotiated his marriage with Scribonia, sister-in-law of Sextus Pompey, and represented him at the conference of Brundisium (40), where peace was made with Antony. During the war with the latter Mæcenas remained at Rome, and administered the civil government of Italy; and after the return of Octavius from the East, it was he who is said to have counselled him to retain the supreme power and establish the empire. The influence of Mæcenas over Augustus, and his participation in the government, still continued for several years; when a coolness sprang up between them, he retired to a palace on the Esquiline hill which he had built, and which had long been the principal resort of all the wits and literati of Rome. His fame rests upon his liberal patronage of literature. Horace was indebted to him for his country estate, and Virgil for the restoration of his property near Mantua, which had been seized by the Octavian soldiery. Mæcenas wrote poems, dramas, and memoirs, all of which have perished save the fragments collected by Lion in *Mæceniatica* (Göttingen, 1824).

**MÆLAR**, or *Mälar*, a lake of Sweden, extending from Stockholm on the east to Köping on the west, a distance of about 75 m., and comprising an area of about 700 sq. m. It has numerous arms branching off in all directions, and communicates with the Baltic by the Södertelge canal, and also by a short channel, on the shores and on an island of which stands the city of Stockholm. The principal streams falling into it are the Fyrisa, Kolbäcksa, Arbogaa, and Thorshälla. On its shores are the cities of Stockholm, Upsal, Enköping, Westeras, and other considerable towns, a great number of villages, and numerous palaces, châteaux, and villas. It contains more than 1,200 islands, of all sizes and of great beauty, upon which are 16 large villages and about 900 domains. About 50 steamers ply between the various ports. The picturesque scenery and abundant fishing give the lake great interest, and pleasure excursions upon it are frequent.

**MÆLSTROM** (Norw. *malestrom*, grinding or whirling stream), an ocean current or whirlpool off the coast of Norway S. W. of the Loffoden islands, in lat. 67° 48' N. and lon. 12° E. It runs between the islands of Vær and Moskenes, or rather between Moskenes and a large solitary rock which lies in the middle of the strait dividing Moskenes from Vær. It is produced by the currents of the Great West fiord. The old account of this whirlpool represents it as terrific, swallowing down ships and even whales; but this was mere exaggeration. According to a statement (1859) by Hagerup, minister of the Norwegian marine, and by Major Vibe, superintendent of the Norwegian hydrographic surveys, who personally examined the Maelstrom and made official reports upon it, when the wind is steady and not too violent, boats may venture upon the whirlpool in summer at flood or ebb tide, when it is still for about half an hour. At the point half way between flood and ebb it is most violent, and boats would then be in danger. At certain times it may be passed at any state of the tide by steamers and by large ships with a steady wind. But in winter and in storms it would be highly dangerous for any vessel to attempt to pass the Maelstrom. During a storm blowing from the west, the stream in winter runs continually to the east at the rate of six knots an hour, without changing its direction with the rising or falling tide; and if at such a time the tide is rising, the stream becomes entirely unnavigable. At certain states of the wind and tide in winter the whole stream boils in mighty whirls, against which the largest steamer could not successfully contend. These whirls, however, would not draw vessels to the bottom as was formerly believed, but would destroy them by dashing them against the rocks, or in case of small vessels by filling them and thus causing them to founder. There is no reason to suppose that the Maelstrom has been changed by any convulsion, or by the wearing away of the rocks.

**MAERLANT, Jakob**, a Dutch poet, born in Flanders about 1235, died at Damme, near Bruges, in 1300. His earliest poems, "The Trojan War" and "Alexander," imitations of French romances of chivalry, are yet unprinted. He afterward devoted himself to the elaboration of Biblical subjects and of didactic themes. He is styled the father of Dutch poetry. Among his metrical productions are a life of St. Francis, in which he follows the Latin of Bonaventura (Leyden, 1848); the *Heimelijkheid der heimelijkheid* (Dort, 1838), after the *Secreta Secretorum* falsely ascribed to Aristotle; *Wapen Martijn* (Antwerp, 1496; Dort, 1834); and *Van den lande van Overzee*. He completed in 1270 a versified version of the Bible (*Rijmbibel*, edited by David, 2 vols., 1858-'60), and began in 1283 his *Spiegel historiel*, which was continued by others after his death. Among his other works is *Der naturen bloeme* (edited by Bormans, Brussels, 1857).

**MAES, or Maas, Nicolas**, a Dutch artist, born in Dort in 1632, died in 1693. In his youth he went to Amsterdam and entered the school of Rembrandt, under whose instruction he became an excellent colorist. He painted small historical subjects, and subsequently portraits. His cabinet pictures are very scarce and bring high prices. His portraits are distinguished by vigor of coloring and skilful relief.

**MAESTRICHT** (Dutch, *Maastricht*), a city of the Netherlands, capital of the province of Limburg, on the Maas, 18 m. W. N. W. of Aix-la-Chapelle; pop. in 1870, 28,840, mostly Roman Catholics. The river, which is spanned by an ancient stone bridge 500 ft. long, divides the city into two parts, the smaller portion on the right bank constituting the suburb Wyk. The city is well built, and the finest squares are the market place and the *Vrijhof* or parade ground. It is famous as one of the strongest fortresses of Europe, and as the principal defence of Holland. The works consist of walls, ditches, and detached bastions, and of the citadel, built in 1701 on the Pietersberg, on the right bank of the river. The surrounding land can be easily laid under water by opening the sluices. The subterranean quarries, situated under the Pietersberg, cover an area of 13 by 6 m., and contain about 16,000 passages, 20 to 50 ft. high and 12 broad. The galleries are supported by thousands of massive pillars, forming a labyrinth dangerous to enter without a guide. The rock resembles chalk, and is ill adapted for building. The caverns abound with fossils, and the bones of a colossal lizard-like reptile, more than 20 ft. long, are found here, and known as the monitor. The most notable public buildings are the town hall, a handsome edifice with a public library and Flemish paintings, and the church of St. Gervais, with five towers and the shrine of that saint, a fine doorway and nave, a "Descent from the Cross" by Vanduyke, and a monument of Charlemagne finished in 1845. The interior of this church was

restored in 1860. Prominent among the other numerous places of worship, including several for Calvinists, is the church of Notre Dame, with two towers and an ancient crypt. Among the principal schools is an atheneum. Public gardens were laid out in 1838. Besides an arsenal, there is a military magazine, and the garrison generally consists of 2,000 soldiers. The principal manufactures are leather, cloth, soap, and rifles. There are brandy distilleries and breweries. Tobacco, madder, and chicory are raised in the vicinity.—Maestricht suffered greatly in resisting Spanish domination. After expelling the Spaniards, the city was immediately reconquered by the duke of Alva, Oct. 20, 1576. Having risen again, it was in March, 1579, invested by Alexander Farnese, who was repulsed early in April. He then built a chain of forts around the city, and compelled its surrender, but with great loss of life on both sides, followed by a dreadful massacre of the inhabitants, in which 6,000 men, women, and children perished. Walloon settlers and vagabonds took the place of the former population, and it was not till 1632 that the city was retaken by Prince Frederick Henry of Orange. It was confirmed to the states general by the treaty of Westphalia (1648). In 1673 it was taken by Louis XIV. In 1748 it surrendered to Marshal Saxe, and in 1794 to Kléber. During the French occupation under the republic and the empire it became the capital of the department of Meuse-Inférieure.

**MAFFEI, Francesco Scipione**, marquis, an Italian author, born in Verona, June 1, 1675, died there, Feb. 11, 1755. He was educated at Parma, and in 1698 entered the academy of the Arcadians at Rome. He was in the Bavarian service during the war of the Spanish succession, and became field marshal. His treatise *Della scienza chiamata cavalleresca*, in which he denounced duelling, was published at Rome in 1710, and in the same year he was one of the founders of the *Giornale dei letterati*. His *Trattato dei teatri antichi e moderni* and his tragedy *Merope* (1713) aided in the reformation of the Italian stage. His *Verona illustrata* (1731-'2; new ed., 8 vols., 1792-'3) was suggested by the discovery of manuscripts in the cathedral of Verona; and his *Gallie Antiquitates* (Paris, 1733) was the result of extensive travels. He published three treatises against the belief in magic, and had a controversy with the Jansenists, who procured his exile when 70 years of age, which however was brief. His collected works were published at Venice (21 vols., 1790).

**MAFFITT, John Newland**, an American clergyman, born in Dublin, Ireland, Dec. 28, 1794, died in Mobile, Ala., May 28, 1850. He became a preacher in the Wesleyan connection in Ireland, and early gave promise of those remarkable powers as an orator that characterized him in after life. He came to the United States in 1819, and was admitted into the New England Methodist Episcopal conference. He spent 12 years as pastor of several prominent

churches, published "Pulpit Sketches" (Boston, 1828), and in 1831 removed to New York, whence he travelled, preaching and lecturing at his own discretion. In 1833, with the Rev. L. Garrett, he founded in Nashville, Tenn., the "Western Methodist," a weekly journal, afterward continued under various names. He also preached at numerous places in the west and south as a revivalist. Wherever he went immense crowds were attracted to his ministry. In 1837 he was elected professor of elocution and belles-lettres in the La Grange college, Ala., which post he held until he was elected chaplain to congress in 1841. In 1845-'6 he edited "Calvary Token," a literary and religious monthly, established by himself at Auburn, N. Y., which was chiefly made up of his own contributions. In 1847, by misfortune growing out of a second marriage, he was obliged to leave for the south, and took up his residence in Arkansas, where he labored with some success for two years, at the expiration of which time he went to some of the chief cities of the south. But his popularity declined rapidly, and he soon died of heart disease. He left an autobiography and an "Oratorical Dictionary."

**MAGADOXO**, or **Magadishu**, an Arabian town, once considered the capital of a kingdom, on the E. coast of Africa, about lat. 2° N., lon. 45° 30' E., subject to the sultan of Muscat; pop. about 4,000. It is a place of considerable trade, being frequented by Arabian and Indian vessels and a few European ships, and by caravans bringing grain, ivory, hides, horses, and slaves from the Galla countries to the west of it. Its imports are chiefly sugar, dates, firearms, and salt fish. The town is surrounded by a wall, and contains a mosque and about 150 houses of stone, the rest of the buildings being of wood. Magadoxo was a considerable town, strongly fortified, when in 1498 it was bombarded by the Portuguese squadron commanded by Vasco da Gama. It was subsequently subject to Portugal.

**MAGALHAENS** (Port. *Magalhães*), **Domingos José Gonçalves de**, a Brazilian poet, born in Rio de Janeiro about 1810. After taking his doctor's degree he went to Europe, and was in 1836 attaché of the Brazilian legation at Paris. He returned to Rio in 1838, and became professor of philosophy and member of the chamber of deputies. Subsequently he was minister at Naples and Turin, and from 1859 to 1867 at Vienna. He is at the head of the national school of Brazilian poetry. His *Poesias* (Rio de Janeiro, 1832) adhere to classical models, but in his metaphysical *Mysterios* and other subsequent works he imitates the romantic poets of France. He is the first author of Brazilian historical tragedies (*Antonio José and Oligato*, 1838-'9). His masterpiece is the lyric poem, *A Confederação dos Tamoyos* (1857), referring to the foundation of Rio de Janeiro and to the early conflicts of the Portuguese with the Tamoyos and other Indian tribes.



Among his later works is *Urania*, a collection of love songs (Vienna, 1862).

**MAGALHAENS**, or **Magellan**, **Fernando**, a Portuguese navigator, believed to have been born in Oporto about 1470, killed at Mactan, one of the Philippine islands, April 27, 1521. Entering the Portuguese navy at an early age, he served for five years in the East Indies under Albuquerque, and participated with distinction in the siege of Malacca in 1511. He withdrew about 1517 to Spain, where he persuaded Cardinal Ximenes that the Moluccas, or Spice islands, then a much coveted possession, might be reached by sailing westward, and thus be claimed by Spain in accordance with the compact between Spain and Portugal that all countries discovered 180° west of the Azores should belong to Spain, while all that were discovered east of that line should be the property of Portugal. A fleet of five vessels of from 60 to 130 tons, manned by 236 persons, was accordingly equipped, and under the command of Magalhaens sailed from San Lucar, Sept. 20, 1519. Making the coast of Brazil, Jan. 12, 1520, he steered southward and entered the Plata river; but finding that it was not a strait, he proceeded again to the southward as far as a harbor on the coast of Patagonia, lat. 49°, which he called Port San Julian. While wintering here he repressed a conspiracy among the four other commanders of his squadron, who were Spaniards, and who hated him for being a Portuguese. Two of them were hanged, another was stabbed, and the fourth, with a priest, his accomplice, was turned out of the ship and abandoned to the mercies of the Patagonians. Magalhaens quitted Port San Julian in October, 1520, having first taken possession of the country in the name of the king of Spain; and proceeding still southward, on Oct. 21, the day of St. Ursula, he entered the strait dividing the island of Tierra del Fuego from the continent of America, which he called the strait of the Eleven Thousand Virgins, but which has ever since borne his name. On Nov. 28 the strait was cleared, and the fleet, now reduced by the desertion of one ship and the loss of another to three vessels, put forth into the sea beyond, to which, on account of the smoothness of its waters, Magalhaens gave the name of Pacific. They sailed over this untraversed ocean for three months and eight days, seeing no land but two sterile islands, and suffering from disease and want of food. On March 6, 1521, the fleet reached a group of islands, which, on account of the thievish propensities of the natives, Magalhaens called the Ladrones, and on the 16th came in sight of Samar, one of the Philippine islands, which Magalhaens named the archipelago of San Lázaro. It is said that the natives of several islands were converted to Christianity by the efforts of Magalhaens. Wishing to extend the field of conversion and subjugation, he landed with 55 armed Spaniards upon the little island of Mactan, whose chieftain refused bap-

tism. The islanders to the number of 1,500 opposed him with vigor, and Magalhaens, having exhausted his ammunition, commenced a retreat to his boats, in the course of which he was killed. The survivors gained the ships with difficulty, and the expedition, reduced to a single ship and 18 men, reached Spain (San Lucar) Sept. 6, 1522, under the guidance of Juan Sebastian Cano. This vessel, the *Vitoria*, was the first to make the circuit of the globe. The voyage of Magalhaens from Spain to the Ladrones lasted 533 days; and although he only made half the circuit of the earth, he had previously sailed from Europe to the eastward as far as Malacca, and perhaps still further, and may be called the first circumnavigator of the globe.—See Bürck's *Magellan, oder die erste Reise um die Welt* (Leipsic, 1844).

**MAGDALA**. See **ABYSSINIA**.

**MAGDALEN ISLANDS** (Fr. *Isles de la Madeleine*), a group in the gulf of St. Lawrence, belonging to Gaspé co., Quebec, Canada; aggregate area, 86½ sq. m.; pop. in 1871, 3,172, of whom 2,833 were of French origin or descent. The principal islands are Coffin's (the largest), at the N. E. extremity of the group, 25 m. long and very narrow; Grindstone and Allright, near the centre; and Amherst, at the S. W. extremity, 6 m. long and 3½ m. wide. Gypsum, found on this island, is an important article of export. Though the soil of the islands is fertile and yields good returns, agriculture is neglected, and the fisheries are the chief dependence of the inhabitants. On Amherst island, which has the best harbor, there is a custom house, and on its S. point (lat. 47° 13' N., lon. 61° 58' W.) is a lighthouse, exhibiting a powerful revolving light. About 20 schooners and 250 fishing boats belong to the islands. The value of the fisheries for the year ending June 30, 1872, was \$126,541, the chief items of catch being 20,032 quintals of codfish, 1,172 barrels of mackerel, 2,956 of herring, 1,713 seals, 8,040 gallons of seal oil, 9,306 of cod oil, and 2,162 of whale oil. The value of imports was \$10,830; of exports, \$20,203; entrances, 25; clearances, 21. By grant from the British crown, the Magdalen islands are the property of a private individual.

**MAGDALENA**, a maritime state of Colombia, bounded N. by the Caribbean sea, E. by Venezuela, S. by the state of Santander, and W. by Bolivar; area, 26,950 sq. m.; pop. in 1870, 85,255. The face of the country is pretty equally diversified with mountain and valley; the E. chain of Colombia forms the boundary with Venezuela; and in the centre is the colossal Sierra Nevada de Santa Marta, an insulated system visible from the sea, and commonly mistaken for the N. extremity of the Andes. The territory is watered by the Rio Magdalena and its tributaries, and the soil is fertile; but the climate is so oppressively hot that the waters of the rivers are continually lukewarm. Yellow fever is epidemic at most of the seaports, the principal of which is Santa Marta,

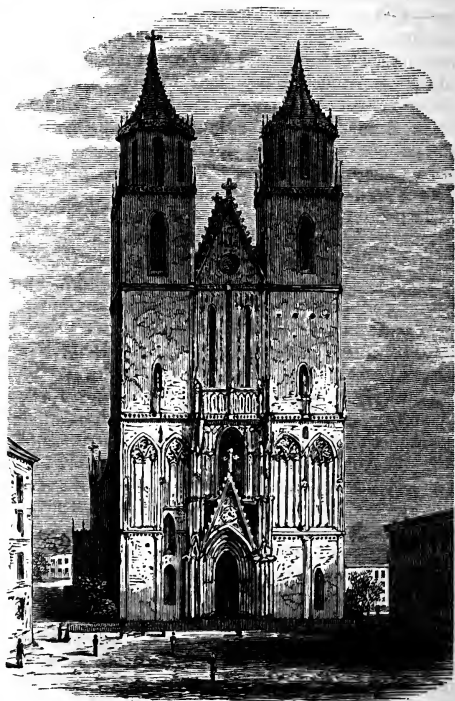
on a fine bay of the same name; and children are subject to a number of acute diseases. Gold abounds in the province; and rice, cotton, coffee, sugar, tobacco, cacao, and the various tropical fruits are largely produced.

**MAGDALENA**, a river of Colombia, rising in the Andes a short distance E. of the source of the Cauca, in lat.  $2^{\circ}$  N., and flowing almost parallel with the latter to about  $9^{\circ} 20'$ , where they unite at the town of Nechi. From this point the Magdalena holds a course due N., and falls into the Caribbean sea at Sabanilla, its whole length being about 850 m. In lat.  $9^{\circ} 57'$  N. a branch separates from the main stream and falls into the sea in lat.  $10^{\circ}$ , 100 m. S. W. of Sabanilla, thus forming a delta or island of 3,000 sq. m. The bed of the Magdalena lies some 1,750 ft. lower than that of the Cauca, and consequently its stream is less impetuous. Navigation by steamers is uninterrupted to Honda (where the cataracts commence), which is reached from the sea in about 35 days, while the down trip is usually accomplished in seven days. Beyond Honda, as far as Neiva, *balsas* and *champones* alone are used, and the principal carrying trade on the whole river was until recently done by these craft. Caymans abound, rendering the navigation dangerous; and myriads of mosquitoes and other noxious insects render it at all times disagreeable. The chief towns on the Magdalena are Neiva, Honda, Tenerife, Barranquilla, and Sabanilla; and besides the Cauca, it receives the waters of the Sogamoso, Sesar, and Bogotá.

**MAGDALENE, Mary.** See MARY MAGDALENE.

**MAGDEBURG**, a fortified city of Prussia, capital of the province of Saxony, on the left bank of the Elbe, 76 m. S. W. of Berlin; pop. in 1871, including Sudenburg, 84,401; with Neustadt-Magdeburg (20,404) and Buckau (9,696), 114,501, besides the garrison, 7,254 men. The Altstadt, or the principal part of the fortification, extends along the river, and comprises 11 bastions. South of the Altstadt is the *Sternschanze* or star bastion, outside the Sudenburg gate, which is considered one of the strongest points. The two are connected by Fort Scharnhorst; and on an island of the Elbe, opposite the Altstadt, and united to it by a bridge, is the citadel, which serves also as a state prison, and in which Lafayette was confined. Another bridge leads to the Friedrichsstadt or *Thurmschanze* (tower bastion), on the opposite or right bank of the river. So extensive are the works that an army of 100,000 men would be required to invest them completely. The houses of the city are for the most part large and handsome, but near the citadel are crowded, and many of the streets are narrow. The most remarkable of the 10 Protestant churches of Magdeburg is the cathedral, built in the 13th and the first half of the 14th century, one of the finest Gothic monuments in N. Germany, surmounted by two towers about 350 ft. high, finished in 1520, with a nave 120 ft. high, a pulpit of al-

baster, now sadly mutilated, 45 smaller altars, with a great variety and beauty in the Romanesque capitals and tympana, and containing the bronze statue of Archbishop Ernest, the tomb of the emperor Otho the Great, and relics of Gen. Tilly. In St. Sebastian's church is the grave of Otto von Guericke, the inventor of the air pump. The equestrian monument of the emperor Otho before the town hall is the oldest in the town. The town hall was built in 1691 and enlarged in 1866. Magdeburg is connected by steamers with Hamburg, and by five railways with the principal towns of Europe. A canal commencing 20 m. below the town unites the Elbe with the Havel.



Magdeburg Cathedral.

The manufactures consist principally of wool- len, linen, and cotton cloth, silk and cotton ribbons, leather, gloves, soap, and candles. There are also important cotton and worsted mills, beet-sugar and chicory factories, breweries, distilleries, oil and vinegar works; and of late the number of machine shops and iron works has largely increased.—Magdeburg is of very ancient origin, and had the privileges of a town in the time of Charlemagne. A Benedictine convent was established there in 937 by Otho the Great, and an archbishopric in 967, which was raised by Pope John XIII. to the primacy of Germany. Luther spent one of his early years at the Franciscan school of Magdeburg, supporting himself by singing in

the streets. On account of its being among the first to embrace the reformation, the town was excommunicated, and was besieged by the elector Maurice of Saxony, Sept. 16, 1550, and surrendered Nov. 9, 1551. During the thirty years' war Magdeburg, in 1629, resisted the imperialists for seven months; but on the morning of May 10 (new style 20) Tilly carried it by assault, and massacred about 25,000 of the inhabitants without distinction of age or sex, reducing the town to ashes, except the cathedral and about 140 houses. In the despatch in which he announced the capture he wrote: "Since the destruction of Jerusalem and Troy such a victory has not been." Upon the house of the commandant, whom he beheaded, may be still read the words: "Remember the 10th of May, 1631." By the peace of Westphalia of 1648, the archbishopric of Magdeburg was allotted to the house of Brandenburg. In 1806, after the battle of Jena, the fortress, though garrisoned by a large force, was surrendered to the French by Gen. Kleister after 14 days' siege. The last siege was the obstinate one which the French stood there in 1813-'14. In 1865 the suburb of Sudenburg was fully consolidated with the Altstadt. In 1869 an enlargement of the city was begun by demolishing the walls and gates of Sudenburg, and considerably advancing the fortifications.

**MAGELLAN, Fernando.** See MAGALHAENS.

**MAGELLAN, Straits of,** a channel separating the southern extremity of the American continent from a group of islands called Tierra del Fuego. Those bordering the channel are, going from E. to W., Tierra del Fuego proper, the largest, Dawson, Clarence, and St. Inez or Desolation islands. The channel received its name from the great navigator who discovered it, Magalhaens, now commonly known as Magellan among northern nations. The eastern entrance of the channel lies between Cape Virgins on the north and Cape Espiritu Santo on the south, and is about 20 m. wide. It enlarges at first into a wider basin, the northern part of which is called Possession bay and the southern Lomas bay. Thence it passes through the First Narrows, about 9 m. long and 2 m. wide, widens again into St. Jago and Philip bays, and after passing the Second Narrows takes gradually a southerly sweep, widening out as far as Cape Froward, the southernmost point of the American continent. Here the direction takes a sudden northwesterly course, which it keeps to its outlet into the Pacific ocean at Cape Pillars. The total length of the straits is 315 m., divided by Cape Froward into two parts, of which the eastern is somewhat the larger. The narrowest part, at Cape Quod in Crooked reach, is only about one mile. The straits have been described or surveyed frequently and from an early period, as for instance by Sir John Narborough, Cordova, Byron, Wallis, Carteret, and Bougainville; but our principal source of knowledge is the surveys and explorations conducted by order

of the British government by Captains King, Stokes, and Fitzroy, in the *Beagle* and *Adventure*, between 1826 and 1836, Charles Darwin being attached to the expedition as naturalist during part of the time. In 1866-'9 additional surveys were made by Capt. Mayne in the *Nassau*, the natural history explorations being in charge of Dr. Cunningham. Numerous accounts can also be found in the records of voyages of circumnavigation by ships of different nations. In 1872 the straits were visited by Agassiz in the United States steamer *Hassler*, and many interesting observations were made on their natural history.—The passage through the straits of Magellan, notwithstanding the advantages it offers over the stormy and dangerous passage round Cape Horn, is seldom attempted by large sailing vessels, principally because of the narrowness of the western reaches, and the violent gusts of wind blowing through them, chiefly from the northwest. Long detentions often occur, as there is not sufficient room for working ship; and many of the harbors being difficult of access, it is often necessary to put back for long distances. It is said that a United States frigate was once 80 days in accomplishing the passage. Actual dangers are few. The water is deep, the shores are bold, and every hidden rock is, as it were, buoyed out by the abundant giant kelp growing over it. Heavy squalls blowing suddenly downward from the mountains, and known as *williwaws*, are much dreaded, as a vessel may be thrown almost on her beam ends, when at anchor, before she has time to swing. For small vessels, and particularly for steamers, the channel is invaluable. The latter, instead of leaving or entering the ocean at Cape Pillars, now frequently use the channels known as Smyth's, Sarmiento's, and Messier, as far as the gulf of Peñas, thus having the advantage of over 300 m. of inland navigation. But for the narrow isthmus of Ofqui, which separates the gulf of Peñas from the sounds inside of the Chonos archipelago, this inland navigation might be extended to the northern end of Chileo, nearly as much further. A fortnightly line of steamers, running from England to Valparaiso, passes regularly through the straits of Magellan, touching at Punta Arenas; and it is intended to make still more frequent trips. A French line has also lately been started. It has been proposed to establish a service of tug boats to tow sailing ships through, for which the successful working of the coal mine at Punta Arenas would offer considerable facilities. In coming into the straits from the east, particular attention must be paid to the tides. The rise and fall in Possession bay is more than 40 ft.; inside the First Narrows it is only 12, and inside the Second 7 ft. These differences occasion a current of 5 or 6 m. an hour. It is therefore usual to anchor in Possession bay, to wait and take advantage of the flood tide to make the passage through the narrows and into

the wider parts of the straits. In passing from the Second Narrows to Cape Froward, vessels keep near the western shore. In this reach, and on that same shore, several good harbors are found, such as Royal road, between Elizabeth island and Peckett harbor (the latter fit only for small vessels), Laredo bay, Punta Arenas or Sandy Point, Freshwater bay, Port Famine, and San Nicolas bay. Sandy Point, the only settlement in the straits, is a penal colony founded by the Chilean government. The situation is well chosen, at the mouth of a clear mountain stream, and at the foot of mountains clothed with luxuriant forests. The climate is less humid than at Port Famine, where the settlement was at first located, and not so arid as on the Patagonian plains further east. Fair pasture is found for cattle, but the summer is not warm enough to allow the ripening of cereals, except a few of the hardiest kinds. Potatoes and green vegetables are raised without difficulty. A coal mine has been opened a few miles up the valley, and connected with the shore by a tramway. The coal appears to belong to the cretaceous formation, is abundant and easily mined, but burns very rapidly and with much smoke. Gold is found in the gravel at the bottom of the stream. Port Famine owes its name to the unfortunate result of the colony founded there in 1584 by Sarmiento. Of the 300 men left by him there and at the Narrows, one was saved in 1587 by Cavendish, and the last survivor by Meriche two years after; all the rest perished miserably. This harbor is still resorted to by vessels detained by contrary winds, and by those in want of firewood, which can be obtained with great ease, the shores being covered with well seasoned driftwood brought down by Sedger river, the largest stream emptying into the straits. From Cape Froward the Pacific ocean can be reached through the Magdalen and Cockburn channel, or through the Barbara channel, a little further west; but they are seldom used except by sealing vessels. The western part of the straits is abundantly provided with small well sheltered bays; unfortunately a number of them are useless as harbors on account of the great depth of water. After passing Cape Froward the channel receives successively the names of Froward reach, English reach, Crooked reach, Long reach, and Sea reach. The harbors are generally small landlocked bays, surrounded by high mountains. The first good one encountered is Fortescue bay, on the E. shore, with its inner harbor, called Port Gallant. Another is York road, at the entrance of Jerome channel. The latter leads off from the straits in a N. E. direction, connecting with two large inland basins, Otway and Skyring Water, very seldom visited and little known. Borja bay in Crooked reach is a convenient and safe harbor, where wood and fresh water can be procured with ease. Playa Parda cove in Long reach is of similar character. These two harbors are on the N.

shore, in Cordova peninsula. Near the entrance to Smyth's channel, Port Tamar and Sholl bay afford good shelter and safe anchorages. On the S. shore, though it is much indented, good harbors are scarce; the best ones are Half-port bay at the W. end of Long reach, and Port Mercy, only 4 m. inside of Cape Pillars. Besides wood and water, the only supplies the country offers to the navigator are fish and shell fish of various kinds.—The character of the country around the straits of Magellan depends in a great measure on the geological formation. In the east it is tertiary overlaid by glacial drift, and the climate is very dry and vegetation scanty, consisting only of grass and small spiny shrubs. The middle region, from Peckett's harbor to Port Gallant, is mostly of secondary formation; the climate is very moist and the soil very favorable to vegetation. The land therefore is covered with dense forests, chiefly of beech, some of the trees attaining great size. In the western section primitive rocks prevail, and the trees are few and small. The shores of this section are very bold and the water deep. Steep mountains terminating in ragged peaks rise here on both sides of the straits, the loftiest being Mt. Sarmiento, 6,800 ft. high, from which and from its neighbor Mt. Buckland descend magnificent glaciers. In the eastern region the grassy plains support numerous herds of guanacos and small troops of ostriches. The other land animals are pumas, foxes, skunks, cavy, a burrowing rodent of the genus *ctenomys*, &c. Eared seals of at least two species, distinguished as hair and fur seals, are common. Large flocks of the upland goose (*Chloëphaga Magellanica*) feed on the plains and congregate on the islands in the breeding season, in company with black-necked swans and swans with black-tipped wings. The small owl found in the burrows of the North American prairie dog inhabits here those of the cavy. The condor and the carraucha (*polyborus*) are very common, and on the water and along the shores ducks, penguins, cormorants, gulls, oyster catchers, &c., are abundant. In the wooded parts of the straits are found humming birds and small flocks of paroquets. The western region is remarkably destitute of animal life, a few species of small birds being the only creatures observed on the shores. Ducks, geese, penguins, and other water birds abound in the channels, and otters, seals, and whales are not uncommon. Fish and shell fish abound in all parts of the straits, and contribute largely to the food of the natives. The native population consists of Patagonians and Fuegians. (See PATAGONIA, and TIERRA DEL FUEGO.)

**MAGENDIE, François**, a French physiologist, born in Bordeaux, Oct. 15, 1783, died in Paris, Oct. 8, 1855. He removed at an early age to Paris, where he graduated in medicine in 1803. He subsequently gave several courses of instruction in operative surgery at the *école pratique*, and has even left a special method of

procedure for the resection of the lower jaw. But he soon devoted himself to the practical study of physiology, and published from 1809 to 1816 a considerable number of memoirs. He was appointed physician to the Hôtel-Dieu, became a member of the academy of sciences, and in 1831 was appointed professor of medicine in the collège de France. It was in this post, which he held for the remainder of his life, that Magendie developed the remarkable talent which distinguished him as a physiological investigator, and exerted so powerful an influence upon physiology and medicine in general, that he may almost be said to have inaugurated and established a new epoch in medical science. Before his time experimenters had been rare, and experiment had been employed, as a rule, in a subordinate manner, and was often regarded as secondary in value to systematic views and the supposed laws of vitality. Magendie, however, insisted that experimentation was the only source of knowledge, and that the brilliant results of scientific generalization were nothing more than empty names, entirely destitute of value. Secondly, he abandoned the consideration of the so-called "vital properties" of the living tissues, introduced by Bichat, which had then become refined and multiplied to an excessive degree, and directed his investigations to the phenomena of a physical and chemical nature manifested by the animal organism, and which could be distinctly perceived and appreciated by the experimenter. In the third place, he experimented constantly upon living animals, for the reason that, the visible phenomena of the living body being the objects of his investigation, this was the only method by which he could hope to learn their real nature. He accordingly had an aversion for systematic scientific doctrines, and considered them as serving only to mislead the mind, and to substitute an intellectual uncertainty for the simple results of direct experimentation. He therefore made the chair of medicine in the collège de France a chair of experimental physiology, without attempting to construct or teach any complete system of physiological doctrine, unless it were that of a rigid and exclusive dependence upon the direct results of experiment. In 1822 he demonstrated the two different properties and functions of the anterior and posterior roots of the spinal nerves. In the previous year he founded the *Journal de Physiologie expérimentale et pathologique*, which he continued to publish for ten years, and to which many of his valuable memoirs were communicated. His most important works are: *Mémoire sur le vomissement* (Paris, 1813); *Mémoire sur l'usage de l'épiglotte dans la déglutition* (1813); *Mémoire sur les propriétés nutritives des substances qui ne contiennent pas d'azote* (1816); *Précis élémentaire de physiologie* (1816-17); *Mémoire sur les organes de l'absorption chez les mammifères* (*Journal de Physiologie*, 1821); *Expériences sur les fonctions*

*des racines des nerfs rachidiens* (ibid., 1822); *Mémoire sur quelques documents récents relatifs aux fonctions du système nerveux* (1823); *Anatomie des systèmes nerveux des animaux à vertèbres* (1825); *Mémoire physiologique sur le cerveau* (1828); *Mémoire sur le mécanisme de l'absorption chez les animaux à sang rouge et chaud* (*Journal de Physiologie*, 1828); *Leçons sur les phénomènes physiques de la vie* (4 vols., 1836-42); *Leçons sur les fonctions et les maladies du système nerveux* (2 vols., 1839); and *Recherches physiologiques et cliniques sur le liquide céphalo-rachidien* (1842).

**MAGENTA**, a town of Lombardy, Italy, about 5 m. from the E. (left) bank of the Ticino and 15 m. W. of Milan, with which city it communicates by railway and canal; pop. about 5,000. It is the first stage on the road from Novara to Milan, being nearly equidistant from the two places. On June 4, 1859, a great battle was fought here between the allied French and Sardinians, under the emperor Napoleon III. and King Victor Emanuel, and the Austrians commanded by Count Gyulai. The French suddenly crossed the Po at Casale (May 31), and, while the Sardinians menaced Mortara, moved toward the north, and threw three bridges across the Ticino at Turbigo, about 8 m. above Magenta. The Austrians thereupon withdrew across the river into the Lombard territory. On June 4 MacMahon's corps, followed by a division of the imperial guard and one of the Sardinian army, having crossed at Turbigo on the preceding day, marched along the left bank toward Magenta, while the emperor in person advanced with the grenadier division of the imperial guard to occupy the bridge of Buffalora, leaving orders for Canrobert to follow. The grenadiers began the contest at noon, and after two hours' fighting took possession of the heights on the canal, in the face of an Austrian force of 125,000. The bridge was seven times taken and lost, but the arrival of Canrobert turned the scale in favor of the French. In the mean time MacMahon's advance from Turbigo had been several times checked by the Austrians, who on evacuating Buffalora concentrated the principal part of their force between him and Magenta. The French 46th regiment of the line made a successful attack upon a farm house defended by two Hungarian regiments, and Gen. Auger planted a battery of 40 guns on the railway, from which he poured a tremendous fire upon the Austrians in flank. On reaching the town of Magenta, MacMahon found it occupied by 7,000 of the enemy under Clam-Gallas, and the second army corps under Prince Liechtenstein. The combat here was terrible, as both sides felt Magenta to be the key of the position. The French took it house by house. At 8½ P. M. Gyulai ordered a general retreat, leaving four guns in possession of the French. His official report gave his own loss at 9,713 killed, wounded, and missing, and that of the enemy at 6,000 or 7,000 killed and wounded. The



French accounts acknowledged a loss of 4,957, and estimated that of Gyulai at 20,000, including 7,000 prisoners. The results of the battle were the evacuation of Lombardy by the Austrians. MacMahon was created a marshal of France and duke of Magenta.

**MAGGIORE, Lake.** See LAGO MAGGIORE.

**MAGI**, the priestly caste of the ancient Persians. It was formerly held that they were a Median race, and that the revolution which gave them their supremacy was a Median outbreak. According to Rawlinson and other recent writers, however, Magism was the old Scythic religion, which maintained itself in Persia after the Aryan conquest, and grew in power and influence despite the frowns of the court until Gomates, a Magus, was raised to the throne as successor of Cambyses. He was speedily overthrown and slain by Darius Hystaspis, and the Aryan religion was restored in triumph over Magism. The wisdom of the Magi caused a secret knowledge of religion and philosophy to be ascribed to them. The name early lost whatever it originally had of ethnological significance, and came to indicate only a caste; and in later times it was applied to diviners and sorcerers of every nation.

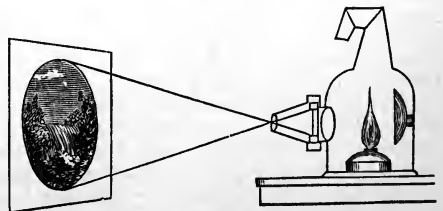
**MAGIC**, as explained by its adepts, the traditional science of the secrets of nature, embracing all knowledge and constituting the perfection of philosophy; also the art of exercising preterhuman powers by means of occult virtues and spiritual agencies. Among the Chaldeans, Assyrians, Egyptians, Hindoos, Bactrians, Medes, and Persians, all the higher kinds of knowledge were confined to the priests, who not only exercised the sacerdotal functions, but attended to the healing of the sick and to the preservation of the secrets of religion and of philosophy, including theology, medicine, and astronomy. These priests were either princes or the counsellors of princes, and were called magi, wise men or philosophers. Magic originally signified only the knowledge possessed by the priest (*mag* or *magus*), but was used at a very early period to designate all occult science, natural or supernatural, including enchantment and any extraordinary operations like those pertaining to alchemy. Later it was applied by the vulgar to all necromancy and witchcraft. But the adepts in magic claim that the sorcerer or practiser of the black art differs from the true magician as the charlatan from the master of the art; and Paracelsus inveighs against such as rank true magicians with conjurers, necromancers, and witches, "those grand impostors who violently intrude themselves into magic, as if swine should enter into a fair and delicate garden." Cornelius Agrippa reckons several different kinds of magic, but these are generally reduced to two: white or divine magic, or magic within its proper province, and black or infernal magic, to which belongs chiromancy, the evil eye, the command of the elements, the power of transforming human

beings into animals, &c. In white magic the devil devotes himself to the magician; in black, the magician devotes himself to the devil. The arts of magic are founded upon a pretended system of the universe, and have their root in astrology. Besides the four elements, fire, air, earth, and water, each with diverse potential characteristics, a fifth essential and superior element is introduced, variously called the astral light, the soul of the world, and the *primum mobile*, which is the grand arcanum of transcendental magic, the tetragrammaton of the Hebrews, the Azoth of the alchemists, and the Thot of the gypsies. By this element, which abounds in the celestial bodies and descends in the rays of the stars, every occult property is conveyed into herbs, stones, metals, and minerals, making them solary, lunar, jovial, saturnine, mercurial, &c., according to the planetary influences. Everything human is represented in it, according to the Platonic notion, as Agrippa maintains, that everything below has a celestial pattern. In it thoughts are realized, and images of past persons and things preserved, so that spectres may be evoked from it and the mysteries of necromancy accomplished. Separated and extracted from matter, it is the philosopher's stone and the elixir of youth. To have command of this element, to direct its currents, and to discern its moving panorama, is the highest attainment and the incommunicable secret of the magician. To reveal it is to lose it; to impart it even to a disciple is to abdicate in his favor. The higher professors of magic have claimed that it demands superior intelligence enlightened by the severest study, a dauntless courage and an unbending will, and discretion, devotion, and habitual silence undisturbed by the temptations of the world. The terrors of initiation into ancient mysteries and mediæval magical rites were designed to test and prove the strength and daring of the candidate. The man who has demonstrated his fearlessness amid conflagration, shipwreck, tempest, and darkness, terrifies the salamanders, undines, gnomes, and sylphs into obedience, and can then evoke them from the fire, water, earth, and air by various modes of divination called respectively pyromancy, hydromancy, geomancy, and æromancy. The magician should be impassible, sober, chaste, disinterested, inaccessible to prejudice and terror, and without physical defect. He should not live exclusively in his laboratory, with his Athanor, elixirs, and crucibles. The intense mental concentration required by every magical operation should be followed by a period of repose. It is claimed that a traditional key to magical arts has been preserved from the time of Solomon, its use being permitted only to the highest priests and to the élite of the initiated. This key is a hieroglyphical and numeral alphabet, expressing by characters and numbers a series of universal and absolute ideas. The celebrated word

*abracadabra* formed the magical triangle of pagan theosophers, to which extraordinary virtues were attributed. It symbolizes the whole magical science of the ancient world. The trident of Paracelsus was believed by him to have all the virtues which the Cabala attributed to words, and which the hierophants of Alexandria ascribed to the *abracadabra*. A complete knowledge and mastery of nature is the transcendent claim of magic. To know things secret and future, to command the elemental spirits, to heal the sick, to provide charms and talismans which shall mysteriously sway the will of others, render one's self invulnerable, and raise tempests, to constrain the devil into service, to evoke the dead, to possess the philosopher's stone and the elixir of life, are the usual objects of magical arts. The highest success can be attained only by the most disinterested purposes and the most unswerving devotion. Thus those who have been believed to possess the secret of making gold, as Nicolas Flamel, passed lives of poverty and privation, while they made princely distributions of wealth.—The practice of magic is traceable to the East, where it still remains in vogue. It is proscribed in the books of Moses, which recognize several distinct kinds as practised by the heathen nations. It played an important part in the religious doctrine and ritual of the Persians; and when the Jews returned from the Babylonish captivity, they brought back Persian ideas with them, and practised in secret the arts which the law forbade. The Greeks, who borrowed the name from the Chaldeans, applied it to all divinations and thaumaturgy. The influence of magic may be traced in the legends of Prometheus, Sisyphus, Æetes, Circe, and Medea. The Romans were thoroughly imbued with it, and had implicit faith in their auguries and divinations; and the mythologies of the Germans, Slavs, and Celts show the influence of similar ideas. Christianity renewed the Mosaic interdiction of magical arts, ascribing their marvels to malignant spirits. The crusaders regarded magic as the peculiar ally of the infidels in their struggle with the soldiers of the cross. In later times a controversy grew up in the church whether magic practised under celestial influences, and with laborious study and research, was lawful; and among some of the most famous reputed practisers of the art were men high in the church. In the 14th century magic rose into repute as a lawful art, and sovereigns maintained magicians at their courts; but public opinion was generally against them, and those of the highest pretensions were apt to be classed with those who had dealings with the devil. Though the legitimacy of magic was disputed, its reality as an art and a science was scarcely doubted down to the 18th century. It has still in Europe a few learned and respectable professors and adepts, while throughout the Mohammedan and pagan world its reality is almost universally admitted, and

its professors are still numerous. Among its famous adepts and writers are Albertus Magnus, Roger Bacon, Arnoldus de Villa Nova, Raymond Lully, Nicolas Flamel, Pico della Mirandola, Basil Valentine, Pietro Pomponazzi, Theophrastus Paracelsus, Cornelius Agrippa, Dr. Faustus, Michael Nostradamus, Jerome Cardan, Andrea Cæsalpinus, Tommaso Campanella, John Dee, Jacob Horst, Robert Fludd, Athanasius Kircher, Jacques Gaffarel, William Lilly, Daniel Defoe, and in the present century Eliphas Levi.—For the discipline and ceremonies of the art, as now maintained, see Eliphas Levi, *Dogme et rituel de la haute magie* (2 vols., Paris, 1856). For various information on the subject, see Horst, *Von der alten und neuen Magie Ursprung, Idee, Umfang und Geschichte* (Mentz, 1820); Grässe, *Bibliotheca Magica et Pneumatica* (Leipsic, 1843); Ennemoser, *Geschichte der Magie* (2d ed., Leipsic, 1844; translated into English by William Howitt, London, 1854); Salverte, *Des sciences occultes* (Paris, 1829; English translation by A. E. Thompson, London, 1846); J. C. Colquhoun, "History of Magic," &c. (London, 1851); M. Schele De Vere, "Modern Magic" (New York, 1873); and François Lenormant, *La magie chez les Assyriens, &c.* (Paris, 1874).

**MAGIC LANTERN**, an optical instrument intended for exhibiting, by means of lenses, magnified images of pictures painted in variously colored transparent gums, on glass slides. It is constructed upon the simple dioptrical principle of conjugate foci (see OPTICS), in accordance with which, when any object, as a picture, is brought upon one side of a convex lens, and at a distance slightly greater than its focal length, such object or picture will be reproduced upon a white screen placed at a certain distance on the opposite side of the lens. In the common form, used for schools or scientific purposes, the instrument consists of a large dark lantern, having at top a bent chimney for the escape of smoke or heated air, and an opening on one side containing a convex lens on a level with the flame of a strong lamp within; the side of the lantern opposite the opening being furnished with a parabolic me-



Magic Lantern.

tallic reflector, for the purpose of collecting the light and throwing it upon the lens. Beyond this lens, within a horizontal tube, the picture is introduced, and beyond this is a second convex lens, a little further than its focal length from the picture, and the distance of

which from the latter is regulated by an arrangement for sliding it within the tube. By the action of the reflector and the first lens, a strong light is condensed upon the picture; and its pencils, being converged and made to cross by the second lens, form at their several foci the image, which, being received at that place by the screen, is rendered visible. The inversion of the image is corrected by placing the slides inverted. For exhibitions before large audiences, the lime light, obtained by keeping a cone of lime ignited in the flame of the oxyhydrogen blowpipe, and revolving at the same time, has been much used; but the apparatus now prepared by M. Dubosc and others (see ELECTRIC LIGHT) enables the experimenter to employ the most intense artificial light known, that of the galvanic current passing between charcoal points; and some of its forms have two reflectors so placed as to throw the images of two pictures at the same time on the same part of the screen, as is required for the effects known as "dissolving views." These effects consist in gradually covering one slide, while the other is uncovered, thus causing one scene to fade or melt into another, as a day into a moonlight scene.

**MAGINDANAO.** See MINDANAO.

**MAGINI, Giovanni Paolo**, an Italian violin maker of the 16th and 17th centuries, born in Brescia. He worked in his native city from 1590 to 1640, contemporaneously with the Amatis, with whom he contributed to fix permanently the form of the violin. His instruments were for the most part of large pattern, the bellies of good quality and very strong, the sides low, the swell of the arch high and full toward the end, from which they have a largeness of tone and a deeper than ordinary sound in the G and D strings. The varnish which he used was exceedingly fine and pure, giving his instruments a deep and clear brown color. Their characteristic tone is grand, penetrating, and noble. In general proportions and in workmanship they resemble the violins of Gaspar di Salo, whose pupil Magini is by many supposed to have been.

**MAGINN, William**, an Irish author, born in Cork, Nov. 11, 1793, died at Walton-on-Thames, near London, Aug. 21, 1842. His father was a classical teacher, under whose care he evinced remarkable aptitude for learning, and in his 10th year he was admitted to Trinity college, Dublin. Though one of the youngest of the competitors on entering, he was one of the most advanced, and he maintained his distinction for scholarship throughout his university career. He taught school in Cork for ten years. At 23 years of age he received the degree of LL. D. from Trinity college, being the first who had ever obtained it so young. Having already contributed in prose and verse to various periodicals, in 1819 he translated the old ballad of "Chevy Chase" into Latin verse for "Blackwood's Magazine," nearly every number of which from that time for many

years contained one or more articles by him. He assumed the sobriquet of Morgan Odoherly, under which he figures in the "Noctes Ambrosiana," which were due to his suggestion. In London he wrote for the "Quarterly Review;" and he was at one time selected in preference to Moore to receive the papers and write the biography of Lord Byron. When in 1824 John Murray started his daily journal, the "Representative," Maginn was sent to Paris as foreign correspondent. In 1828 he became junior editor of the London "Standard," an ultra tory journal. He was one of the projectors of "Fraser's Magazine" in 1830. In 1837 he began his "Shakespeare Papers," and the first of his 16 Homeric ballads appeared in 1838. Irregular habits caused his connection with the "Standard" and with "Fraser" to be broken off. In 1839 he became editor of the "Lancashire Herald," a weekly journal in Liverpool, but was not successful, and he returned to London the same year. In 1840 he began a weekly issue of "Magazine Miscellanies, by Doctor Maginn," which extended only to 10 numbers. He was beset by creditors, and in 1842, being cast into Fleet prison for debt, he passed through the insolvency court, and became reduced to great poverty. He was the author of "Whitehall, or the Days of George IV., a Romance" (London, 1827); "John Manesty" (1844), completed after his death by Charles Ollier; and "Homeric Ballads" (1849). Besides his papers in "Blackwood," "Fraser," and the "Quarterly," he wrote many others, equally marked by wit and scholarship, for "Bentley's Miscellany" and the first two volumes of "Punch." His "Fraserian Papers," "Odoherly Papers," "Homeric Ballads," and "Shakespeare Papers" have been collected and edited by R. S. Mackenzie (5 vols., New York, 1855-7).

**MAGLIABECCHI, Antonio**, an Italian scholar, born in Florence in 1633, died there in 1714. He was apprenticed to a goldsmith in his native city, but ultimately abandoned his trade and devoted himself to literature. He attracted the notice of Michele Ermini, librarian to the cardinal de' Medici, under whose instruction he acquired a thorough knowledge of Latin, Greek, and Hebrew. Cosmo III. appointed him his librarian, in which congenial situation he grew so absorbed in his books as to disregard the ordinary comforts and pleasures of life. He usually passed the whole night in study, and when exhausted nature demanded rest, a wretched straw chair served him for a couch, and an old threadbare cloak for a coverlet. His memory was prodigious. By the time of his death he had accumulated a library of 30,000 volumes, which, with funds for its preservation and enlargement, he bequeathed to the city of Florence. It is known by the name of the Magliabechiana, and is open to the public. We owe to Magliabecchi the preservation of many works that had long lain in manuscript in the Lau-

rentian library of the Medici. He produced no literary work of his own.

**MAGNA CHARTA**, the **Great Charter**, or the "Charter of Liberties," as it is commonly called by English writers, a constitutional instrument executed by King John of England, guaranteeing to the people in perpetuity the enjoyment of certain rights and privileges. Our word charter shows that the Latin *charta*, which meant simply paper, was at length used in the sense of a legal instrument, much as the word paper is sometimes used now. The word charter was however most commonly used to signify the written evidence of grants of land or of privileges from a feudal lord to an abbey or other religious house. From this it was extended to mean the records of all grants from feudal superiors to their subordinates, whether civil or ecclesiastical, and all agreements between them. The Great Charter is of this description, but is from the sovereign to the people. It begins: "John, by the grace of God, king," &c., to various dignitaries and officers, describing them not by name but by office, and "his other faithful subjects: Know ye, that we, for the health of our soul, &c., and by the advice of [sundry persons enumerated], have granted . . . and confirmed, for us and our heirs for ever." But while, in form, the charter was only a gift of certain rights and liberties by the king, it was a very different thing in fact. The Anglo-Saxon institutions and usages, which were very favorable to liberty, had been almost suppressed by the Norman conquerors. The Norman kings, perhaps from the necessity which belonged to their position in England as sovereigns of an invading and conquering race, who needed to hold full and unchecked powers to enable them to preserve what they had won, had claimed and exercised an almost despotic authority. This began to alarm and perhaps to oppress the nobles; and after some struggles and conflicts the feudal possessors of the land of England succeeded in wresting from the feeble hands of John the important concessions contained in the Great Charter. These were very far, however, from being original concessions. There is scarcely one of them, of any importance, which may not be traced back in its principle, if not in its form, to Anglo-Saxon times. The nobles found that these usages, or principles, were all that they wanted to secure their own rights; and by demanding them only they secured the cooperation of a great part of the clergy and of all the cities and burgesses, and thus were enabled to gain such a superiority over the forces which John could bring to his aid, as to compel him to a peaceful acquiescence in their demands. The preliminaries were agreed upon; the principal provisions of the charter were determined upon and ratified in a preliminary instrument by the king; and then he met the deputies of his nobles, and some of his clergy, at Runnymede, and there, on June 15, 1215, the charter was

executed. It bears the seal of the king, and of a large number of nobles. Many copies were made at once, probably one for each county and diocese, and for some other bodies. Two of these originals, for all may be called so, are still preserved in the Cottonian library in the British museum; and there are copies extant made at later periods. Some doubt still rests upon the text, however, in passages of some importance. That printed at the beginning of the first volume of "Statutes at Large," in folio, is in fact a translation of the great charter of Henry III., which purported to be a confirmation of the charter of John. It was however duly enacted by the three estates of parliament, which the charter of John never was. Sir William Blackstone published an edition of it from the Cottonian original (Oxford, 1759). It was drawn up in the Latin language, and the translations into English vary considerably. Thus the famous section 29 (sometimes numbered 45), which has been called the essence and glory of Magna Charta, runs thus: "No freeman shall be taken, or imprisoned, or disseized, or outlawed, or banished, or anyways injured, *nor will we pass upon him, nor send upon him*, unless by the legal judgment of his peers or by the law of the land." The phrase which we put in italics is an exact translation of *nec super eum ibimus, nec super eum mittemus*; but it has been much disputed what this means. In Coke's opinion it is, that no man shall be condemned in the court of king's bench, where the king is supposed to be present, nor before any commissioner or judge whom the king may depute or delegate to try him. The meaning of some other passages is equally obscure; but it is made so only by the lapse of time, and the disuse of phraseology once well understood. For the searching and thorough protection of right and suppression of all wrong afforded by the provisions of this remarkable instrument, and the singular force and precision of much of the language used, prove that those mailed barons had men among them, or at their call, who could employ in their service all the resources of the best cultivated intellects. It was regarded at the time as of so great importance, that the barons compelled the king to put into their possession the city and tower of London, to be held by them for a certain time as a pledge for the due observance of the charter. They also required him to consent that 25 of their number should be chosen as "guardians of the liberties of the realm," with power to make war upon the king if he should violate the charter. In the subsequent reigns it was repeatedly confirmed, the sovereigns of England finding that when they were in peril and their subjects disposed to resist them, they could do nothing so popular as make a solemn confirmation of the "Charter of Liberties." This circumstance, and the traditional reverence for Magna Charta, together with its actual value, have caused some mis-

takes concerning it. The nobles who procured it are often called the patriots of their age, and are believed to have contended for the rights of the people. This is not quite true. Everything in the charter itself, and whatever is related concerning it in contemporaneous history, lead to the conclusion that the purpose of those who formed it was mainly to preserve the rights and privileges of their own order; and the provisions for the security of merchants, and of freemen generally, while dictated probably by some desire to secure their rights, was the readiest way to obtain that coöperation of various interests which was necessary to insure success. In the 13th century the villeins or serfs were probably the majority of the inhabitants of England; but the word villein occurs in Magna Charta but once. In one section it is declared that if a freeman be amerced for crime, it shall be "saving his contentment," by which word is meant the means of his livelihood, as the tools of a mechanic or the like; and a merchant "saving his merchandise;" and (in the next section) a villein "saving his wainage," and while these (his plough, wagons, and cattle) were certainly the tools of his trade, it is, from the character of the whole instrument, and of the times in which it was made, a not unreasonable inference that this single precaution for the benefit of the villein was at least recommended by the fact, that it preserved to him those implements without which he would be of little use to his lord. In truth, Magna Charta was intended mainly for the nobles and landholders of England; but it embraced in its terms all freemen. It was admirably contrived, and never lost its force; and as, in succeeding ages, villeinage gradually disappeared, and the serfs rose into the condition of freemen, they rose also into the protection and came within the benefit of Magna Charta. Hence there was a constantly increasing class who looked up to it with reverence and with confidence. Its force was never lost by disuse, and its principles were never forgotten. It made the habeas corpus act and similar securities for personal rights and liberties possible; and in this way it may deserve the epithet which Mr. Hallam uses, when he calls it "the keystone of English liberty."—The general provisions of Magna Charta may be stated briefly. It confirmed the liberties of the church, and redressed some grievances incidental to feudal tenures. It prohibited unlawful ameracements, distresses, or punishments, and restrained the royal prerogative of purveyance and preëmption. It regulated forfeiture of lands, and prevented the grant of exclusive fisheries, or of new bridges injurious to a neighborhood. It established, or at least founded, the right of the owner of personal property to dispose of it by will, and it put the law of dower on the footing on which it has ever since stood. It protected merchants, required uniformity of weights and measures, and forbade alienation of lands in mortmain. It guard-

ed against delays and denials of justice, and brought the trial of issues within reach of all the freemen by means of assizes and circuits; and it asserted and confirmed those liberties of the city of London, and all other cities, boroughs, towns, and parts of the kingdom, from which, as from so many centres, political freedom afterward spread through the land. It protected every freeman from loss of life, liberty, or property, except by the judgment of his peers or the law of the land; and by it the king promised that "We will sell to no man, we will not deny or delay to any man, right or justice." Magna Charta is often appealed to in the discussion of constitutional questions in the United States, and its promise of protection by "the law of the land" is incorporated in some form in every American constitution.

**MAGNA GRÆCIA**, the collective name of the ancient Greek cities and districts in southern Italy (according to Strabo, also of those in Sicily), applied chiefly to the cities on the Tarentine gulf (Tarentum, Sybaris, Croton, Metapontum, Locris, Rhegium, &c.) and on the western coast (Cumæ, Neapolis, &c.). Improperly the name is used also for the whole south of Italy, including especially the provinces of Apulia, Calabria, Lucania, and Bruttium, and not alone of the Grecian settlements.

**MAGNAN, Bernard Pierre**, a French marshal, born in Paris, Dec. 7, 1791, died there, May 29, 1865. He studied law, but at the age of 18 enlisted in the army, and served in Portugal and Spain from 1810 to 1813. Being transferred to the imperial guard, he served with it until the capitulation of Paris. In 1815 he was received in the royal guard, and in 1823 fought in the Spanish campaign. In 1830 he distinguished himself in Algeria, and was made commander of the legion of honor. In 1831 he was suspended for temporizing with the insurrection among the workmen of Lyons, which he was ordered to suppress. He then entered the Belgian army, with the rank of general of brigade. In 1839, when there was danger of a war with Holland, he commanded at Beverloo 25,000 men. Peace having been signed between the two countries, he returned to France. After being stationed for a short time in the Pyrenees, he obtained command of a division in the department of Le Nord, which he held for seven years, being several times called on to suppress insurrections. In 1840 he was accused of complicity in Louis Napoleon's attempt at Boulogne, but defended himself against the charge. He became lieutenant general in 1845, and on the revolution of February, 1848, he offered his services to Louis Philippe, who declined them. Under the provisional government he commanded the third division of the army of the Alps. During the insurrection of June he rapidly advanced to the relief of Paris. He suppressed an insurrection at Lyons after a desperate conflict of six hours, and for this received the cordon of



a grand officer of the legion of honor, and was promoted to command the division of Strasburg. In July, 1849, he was elected to the legislative assembly, but took little part in the sittings, being prevented by military duty. He was appointed to the command of the army of Paris, July 15, 1851, aided Louis Napoleon in organizing the *coup d'état*, and fought under Gen. Saint-Arnaud on Dec. 2, 3, and 4. He was promoted to the rank of marshal, in 1852 was made a senator, and in 1854 grand huntsman. On the outbreak of the Italian war in 1859, he took command of the army of Paris.

**MAGNAN, Valentin**, a French physician, born in Perpignan, March 16, 1835. He completed his studies in Paris in 1863, and won in 1865 the Civrieux academical prize for his *Étude clinique sur la paralysie générale* (new ed., 1873). In 1867 he became physician to the asylum of Ste. Anne, connected with the central administration of lunatics, and here he acquired celebrity by his lectures on the fatal effects of alcohol and absinthe. An additional Civrieux prize was awarded to him in 1873 for his treatise *Des diverses formes du délire alcoolique et de leur traitement*. His *Étude expérimentale et clinique sur l'alcoolisme* (1871), and contributions to medical and other journals, have exerted much influence in promoting the cause of temperance in France.

**MAGNENTIUS, Flavius Popilius**, Roman emperor of the West, died in August, 353. He is said to have been of a German family of Gaul, and taken captive by Constantius Chlorus or Constantine. Under the latter he rose to the rank of count. Having been intrusted by Constans with the command of the Jovian and Herculean legions, which had been substituted for the ancient prætorian guards at the remodelling of the empire by Diocletian, he availed himself of his office to plot the emperor's overthrow. On Jan. 18, 350, presenting himself in imperial robes at a great banquet given by one of the conspirators at Autun, he was immediately saluted with the title of Augustus; and assassins sent for the purpose having despatched Constans, Magnentius was acknowledged as emperor by all the western provinces except Illyria. Constantius, on hearing of his brother's murder, hastened from the confines of Persia and defeated Magnentius in a most sanguinary battle at Mursa (Eszék) on the Drave in 351, and in the passes of the Cottian Alps in 353. These disasters led to the defection of all the countries that had recognized the usurper, who thereupon committed suicide.

**MAGNESIA. I.** The most easterly division of ancient Thessaly, Greece, a narrow and mountainous strip of land, containing among others Mts. Ossa and Pelion, and bounded N. by the lower course of the Peneus, on the confines of the Macedonian district of Pieria, E. and S. E. by the Ægean, S. W. by the Pagassæan gulf, and W. by the great Thessalian plain. **II.** The name of two ancient cities of Asia Minor. One, a town of Lydia (now Ma-

nissa), was situated on the Hermus, at the foot of Mt. Sipylus, and celebrated by the great victory of the Romans over Antiochus the Great of Syria (190 B. C.), which made the conquerors masters of a part of Asia Minor. The other, in Caria, was situated on the river Lethæus in the valley of the Mæander, and had a celebrated temple of Diana, the ruins of which are still visible.

**MAGNESIA**, the only known oxide of the metal magnesium, one of the alkaline earths, the compound character of which was discovered by Davy. It consists of 60 per cent. of magnesium and 40 of oxygen. Like lime, it is found in nature combined with carbonic acid, which may be expelled by calcination at a red heat; the native oxide is called periclase. It is a fine, light, white powder, having neither taste nor smell, almost insoluble in boiling water but less so in cold, of specific gravity 2.3, and known as calcined magnesia. It was regarded as infusible until melted by Dr. Hare with his compound blowpipe. Its properties are alkaline, and it neutralizes all acids. Magnesia exists in the magnesian limestones (see DOLOMITE), and forms the mineral species magnesite. From these it may be obtained, but the sources that chiefly furnish it are the sulphate of magnesia (see EPSOM SALT) of mineral springs, or this salt mixed with chloride of magnesium supplied by the bittern of salt works. Magnesia alba is prepared by mixing together dilute solutions of sulphate of magnesia and carbonate of soda, with or without heating. An interchange of acids and bases takes place, and an insoluble carbonate of magnesia is precipitated, which may be washed with hot water, collected, and dried. For heavy magnesia a cold saturated solution of carbonate of soda is added to an equal volume of boiling saturated solution of sulphate of magnesia, and three volumes of water. The mixture is boiled till effervescence has ceased, and then more boiling water is added, the whole being continually stirred. This variety is granular, while the light is more or less intermixed with prismatic crystals. The light cubes of magnesia are prepared by removing the precipitate, after it has drained for one or two days in linen strainers, to cubical moulds open at the bottom, and standing in a warm room upon a table of plaster or porous stone, which absorbs the water. After a time the moulds are turned over, so as to present another side to the absorbent surface. Carbonate of magnesia resembles the calcined in its appearance and qualities; it is somewhat more soluble in cold than in hot water, but still requires to dissolve it 9,000 parts of the latter and 2,493 of the former. It contains some water in its composition, but the proportions of its ingredients vary with the methods of its preparation. The hypochloride of magnesia has bleaching properties equal to those of chloride of lime.—Several salts of magnesia are used in medicine, the most important being the oxide, carbonate, sulphate,

and citrate. The oxide and carbonate are frequently used in indigestion, to neutralize an excess of acid in the stomach or to act as gentle laxatives, which they do after combining with any acid. If when administered they do not meet with an acid in the alimentary canal, and consequently do not cause a laxative action, it is desirable to follow their administration with that of lemonade or a similar acid. The simple oxide of magnesia differs from the carbonate in affording by its combination no carbonic acid. Magnesia freshly prepared has been recommended as an antidote in arsenical poisoning, but is less efficient than the hydrated oxide of iron. These substances are used in pharmacy in the preparation of aromatic waters, the fineness of the powders serving to divide minutely the volatile oil with which they are impregnated, and thus present to the menstruum a much larger surface than could be obtained by simple admixture. The sulphate and citrate are considerably used as cathartics. The former is an exceedingly efficient member of the class, and acts without undue violence. It produces copious and rather watery discharges. It is occasionally combined with other more drastic purgatives, to mitigate their violence. If these salts fail to act as cathartics, which may happen if they are administered in small and repeated doses, they are absorbed and pass out of the system through the kidneys. The effervescent preparations, both solid and liquid, known as citrate of magnesia and popularly used as laxatives, usually contain, in addition, citrate or tartrate of sodium or potassium. The average dose of sulphate of magnesia is an ounce. It acts best when it is freely diluted with water, and should be given on an empty stomach. In cases of nausea, it will often be retained when other cathartics are rejected. It is best suited to inflammatory conditions of the system, and is contraindicated by debility and prostration. A solution of the citrate of magnesia resembles lemonade in taste.—Magnesia in combination with silica enters largely into the composition of many rocks and minerals, such as serpentinite, steatite or soapstone, asbestos, meerschaum, augite, hornblende, and olivine.

**MAGNESIUM**, the metallic base of magnesia; symbol, Mg.; chemical equivalent, 12; specific gravity, 1.74; hardness, that of calcareous spar. Davy proved its existence; but Bussy in 1830 first obtained it in sufficient quantity to test its properties. He decomposed the chloride of magnesium by transmitting through it when heated the vapors of potassium. Since the discovery of large deposits of the double chloride of potassium and magnesium, known as carnallite, in the salt mines of Stassfurt, it has been proposed to use this mineral in the

preparation of the metal; 1,000 parts of carnallite are fused with 100 parts of fluor spar and 100 parts of sodium. The metal resembles silver in appearance; it is malleable, ductile, and fuses at a dull red heat, and can be distilled like zinc. It does not change under water or in dry air, but in damp air it soon oxidizes. It consumes with a brilliant white flame when heated to redness, or when thrown into hydrochloric acid. It burns brilliantly in chlorine or in the vapors of bromine, iodine, sulphur, &c. It was proposed by Bunsen to employ this metal in the form of fine wire for illuminating purposes. He found that it might be lighted by the flame of an alcohol lamp, and in burning gave a perfectly steady and very intense light. A wire  $\frac{1}{16}$  of an inch in diameter burns at the rate of about three feet in a minute, and gives a light equal to that of 74 stearine candles of five to the pound. The weight of such a wire three feet long is about two grains. Bunsen proposed to have the wire wound upon bobbins and furnished at a regular rate to the lamp. Should the metal be procurable at a considerably reduced cost, as may very likely follow an increased demand for it, it may then prove an excellent method of furnishing light for domestic purposes, and more particularly for lighthouses and uses requiring a great intensity of light. It is now used in magic lanterns and for photographing in places inaccessible to the light of day. For the latter application it is especially adapted by reason of the extraordinary power of the photo-chemical property of its light. The alloy of silicon with magnesium, when decomposed by hydrochloric acid, evolves a hydride of silicon, which is a spontaneously combustible gas. Metallic magnesium precipitates nearly all metals from their neutral solutions.

**MAGNET** (from Gr. *λίθος Μαγνήτης*, the Magnesian stone), the name applied to a mass of steel or iron, or of natural iron ore, that has the property of attracting to itself otherwise inert iron. Magnets probably first became known to the Aryan races through the discovery of natural magnets by the Greeks in the Thessalian district of Magnesia. The various phenomena presented in experiments with magnets have given rise to the modern branches of physical science known as magnetism, terrestrial magnetism, electro-magnetism, and magneto-electricity, which are treated under their own names. Natural iron magnets are exceedingly rare, but a magnetic iron ore is found in large quantities in Sweden and in the states of New York and New Jersey. The important property that a freely supported magnetic bar possesses of turning steadfastly toward the poles of the earth under the influence of terrestrial magnetism is treated of in the article on that subject. (See also COMPASS.)

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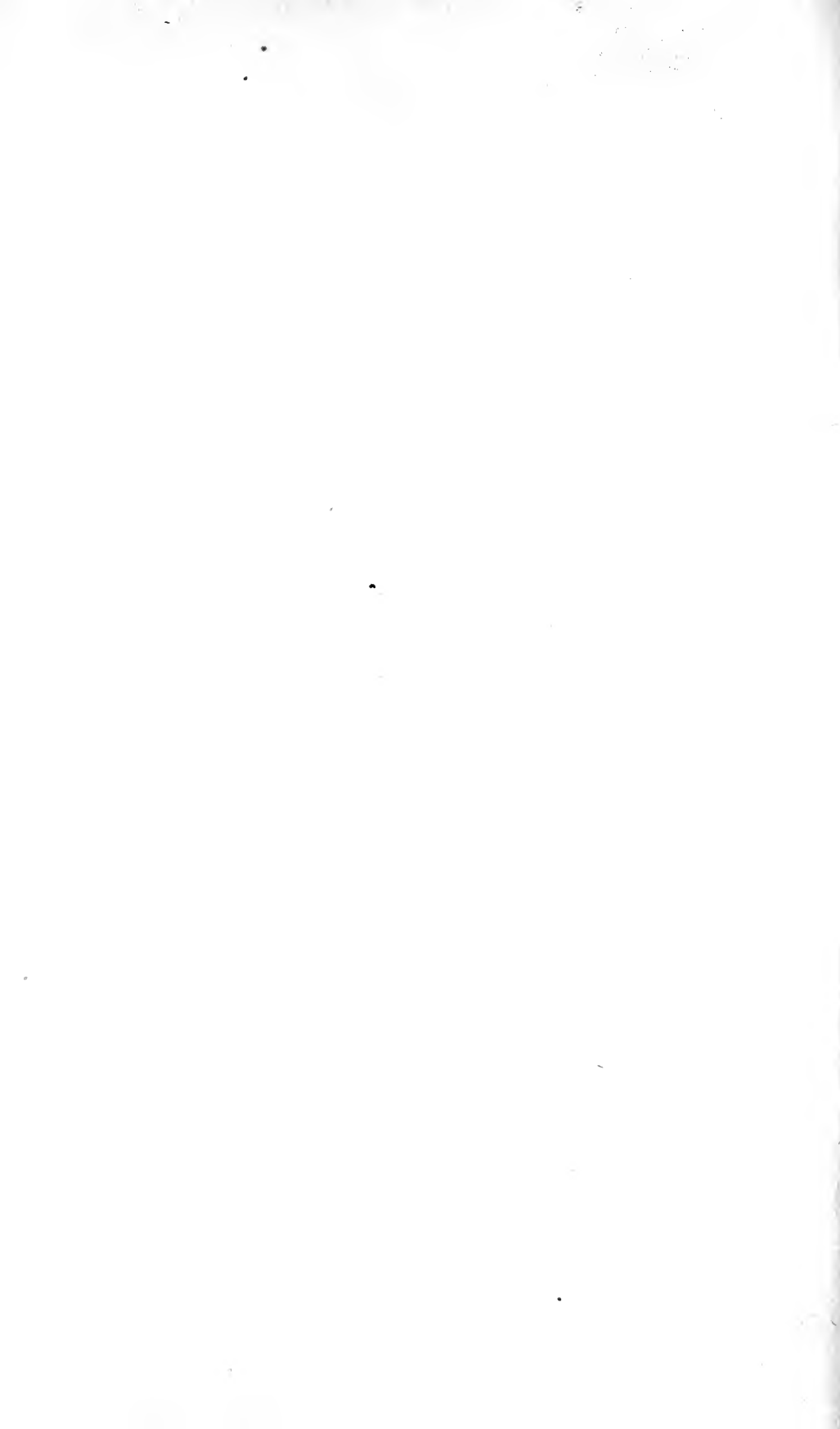
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